ADMINISTRATIVE DRAFT ENVIRONMENTAL IMPACT REPORT

NEPTUNE MARINA APARTMENTS AND ANCHORAGE/WOODFIN SUITE HOTEL AND TIMESHARE RESORT PROJECT

Volume II
Appendices

Lead Agency:

County of Los Angeles
Department of Regional Planning
320 West Temple Street
Los Angeles, California 90012

Parcel 10R
Project R2006-03647
RCDPT200600008
RCUPT200600289
RENVT200600217
RPAT200600013
RVART200600013

Parcel FF
Project R2006-03652
RCDPT200600009
RCUPT200600290
RENVT200700024
RPAT200600014
RVART200600014
RPKPT200600021

Parcel 9U North
Project TR067861
RCDPT200600007
RCUPT200600288
RENVT200600216
RPKPT200600020
RVART200600012
TR067861

Parcel 9U South
Project R2006-03643
RCDPT200600006

Basin Adjacent to Parcel 9U
Project R2006-03644
RPPT200602191

March 2008

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APPENDIX 1.0

Notice of Preparation and Comment Letters

Notice of Preparation

Notice of Preparation

The Neptune Marina Apartments and Anchorage/ Woodfin Suite Hotel and Timeshare Resort Project

Marina del Rey, California

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Project No. R2006-03647
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TR067861

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Project No. R2006-03644
RPPT200602191

Los Angeles County
Department of Regional Planning
320 West Temple Street
Los Angeles, California 90012

March 2007

Notice of Preparation

The Neptune Marina Apartments and Anchorage/ Woodfin Suite Hotel and Timeshare Resort Project

The County of Los Angeles will be the Lead Agency and will prepare a single Environmental Impact Report (EIR) for the projects identified below. In compliance with Section 15082 of the *California Environmental Quality Act (CEQA) Guidelines*, the County of Los Angeles is sending this Notice of Preparation (NOP) to each responsible and federal agency and interested parties involved in approving the project and to trustee agencies responsible for natural resources affected by the project. Within 30 days after receiving the NOP, each agency and interested party shall provide the County of Los Angeles with specific details about the scope and content of the environmental information related to that agency's area of statutory responsibility. Potential responsible agencies for these projects are considered to be the California Coastal Commission, California Department of Fish and Game and the U.S. Army Corps of Engineers.

The purpose of this NOP is to solicit the views of your agency as to the scope and content of the environmental information germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The review period for the NOP will be from March 22 to April 21, 2007. Due to the time limits mandated by state law, your response must be received by our office at the earliest possible date, but not later than April 21, 2007. Please direct all written comments to Mr. Rick Kuo, County of Los Angeles Department of Regional Planning, 320 West Temple Street, Room 1348, Los Angeles, California 90012, Telephone (213) 974-6461, Fax (213) 626-0434. In your written response, please include the name of a contact person in your agency.

1.0 PROJECT DESCRIPTION

1.1 Project Location

The proposed Neptune Marina Apartments and Anchorage and Woodfin Suite Hotel/Timeshare Resort project site (**Figure 1**) is located in the western portion of the Marina del Rey small-craft harbor. Specifically, the project site totals 13.03 landside acres and 4.68 waterside or submerged acres. This project involves Marina del Rey Parcels 10R, FF, and 9U as depicted on **Figure 2**.

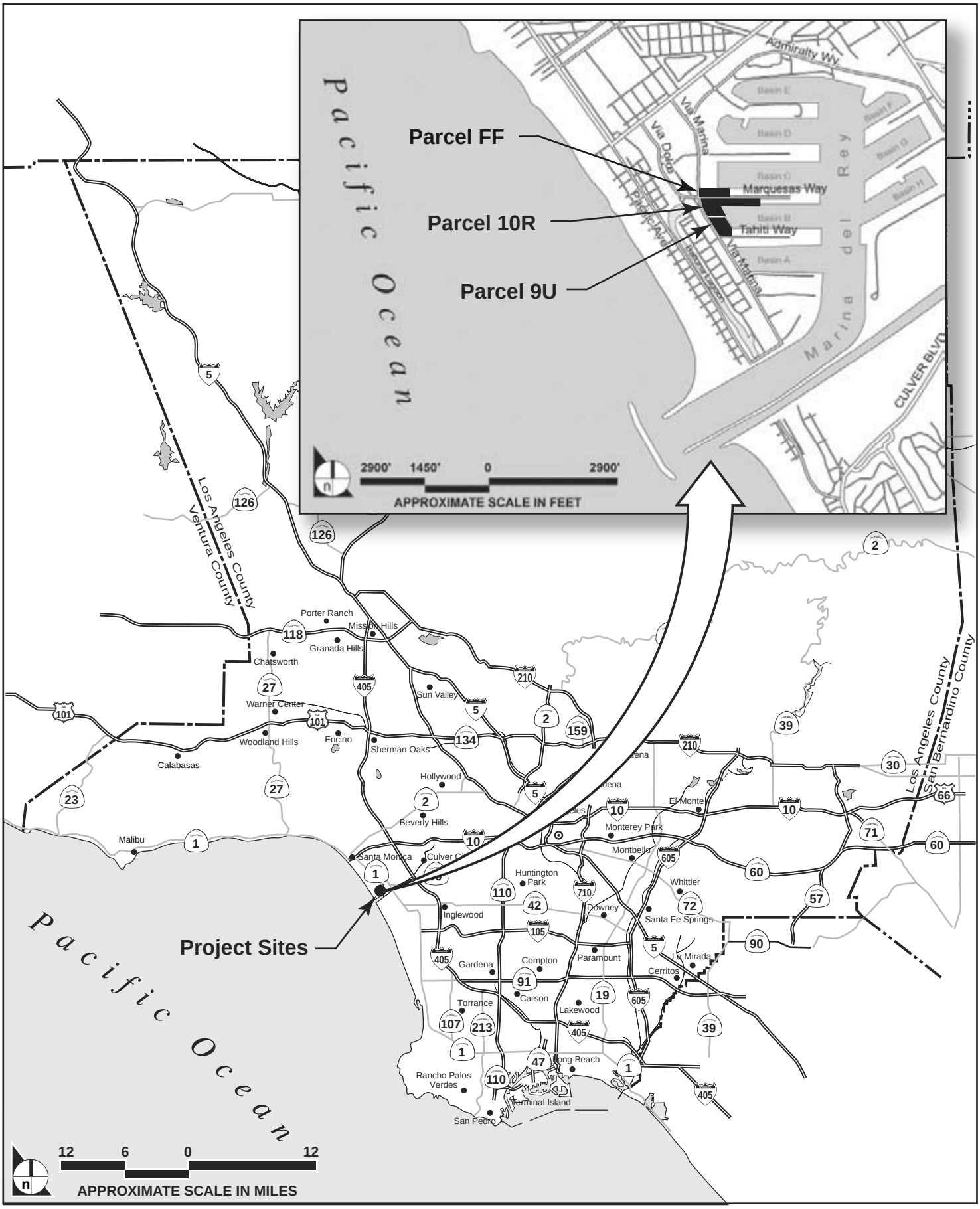
Parcel 10R is a rotated L-shaped site that wraps partially around "Basin B" of the Marina del Rey small-craft harbor. The parcel consists of a total of 7.32 landside acres and 4.68 waterside or submerged acres. The perimeter of the site is bordered to the west by Via Marina and to the north by Marquesas Way. Marina del Rey Parcel 9U forms the southern boundary of the landside portion of the parcel, while Marina del Rey Parcel 12R forms the easternmost boundary on the landside portion of the parcel. The site perimeter extends into the waters of Basin B to the south and east.

Parcel FF is a rectangular site that lies on the southwest corner of "Basin C" of the Marina del Rey small-craft harbor. The parcel consists of 2.05 landside acres and borders the waterfront along approximately 200 linear feet of the site. The perimeter of the site is bordered to the west by Via Marina and to the south by Marquesas Way. Its easternmost boundary is formed by Marina del Rey Parcel 13R. Marina del Rey Parcel 15U and the waters of Basin C comprise the northern boundary of the site.

Parcel 9U consists of 3.66 landside acres and is bound by Marina del Rey Parcel 10R to the north, Via Marina to the west, Basin B of Marina del Rey to the east and Tahiti Way to the south.

1.2 Overview of Site Plan

Figure 3 illustrates a conceptual site plan for the proposed Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort project (Neptune Marina/Woodfin Suite Hotel/Timeshare Resort project, or project). The project consists of five components, each requesting a separate coastal development permit, that include (1) Neptune Marina Apartments and Anchorage on Parcel 10R; (2) Neptune Marina Apartments on Parcel FF; (3) Woodfin Suite Hotel/Timeshare Resort on the northern portion of Parcel 9U; (4) a 1.46-acre restored public wetland and upland park area on the southern portion of Parcel 9U; and (5) a public/"transient" boat anchorage proximal to Parcel 9U within Marina del Rey Basin B. It is important to note that Components 4 and 5 are project features of the Neptune Marina development on Parcel FF (Component 2) and are necessary for the Parcel FF approval.

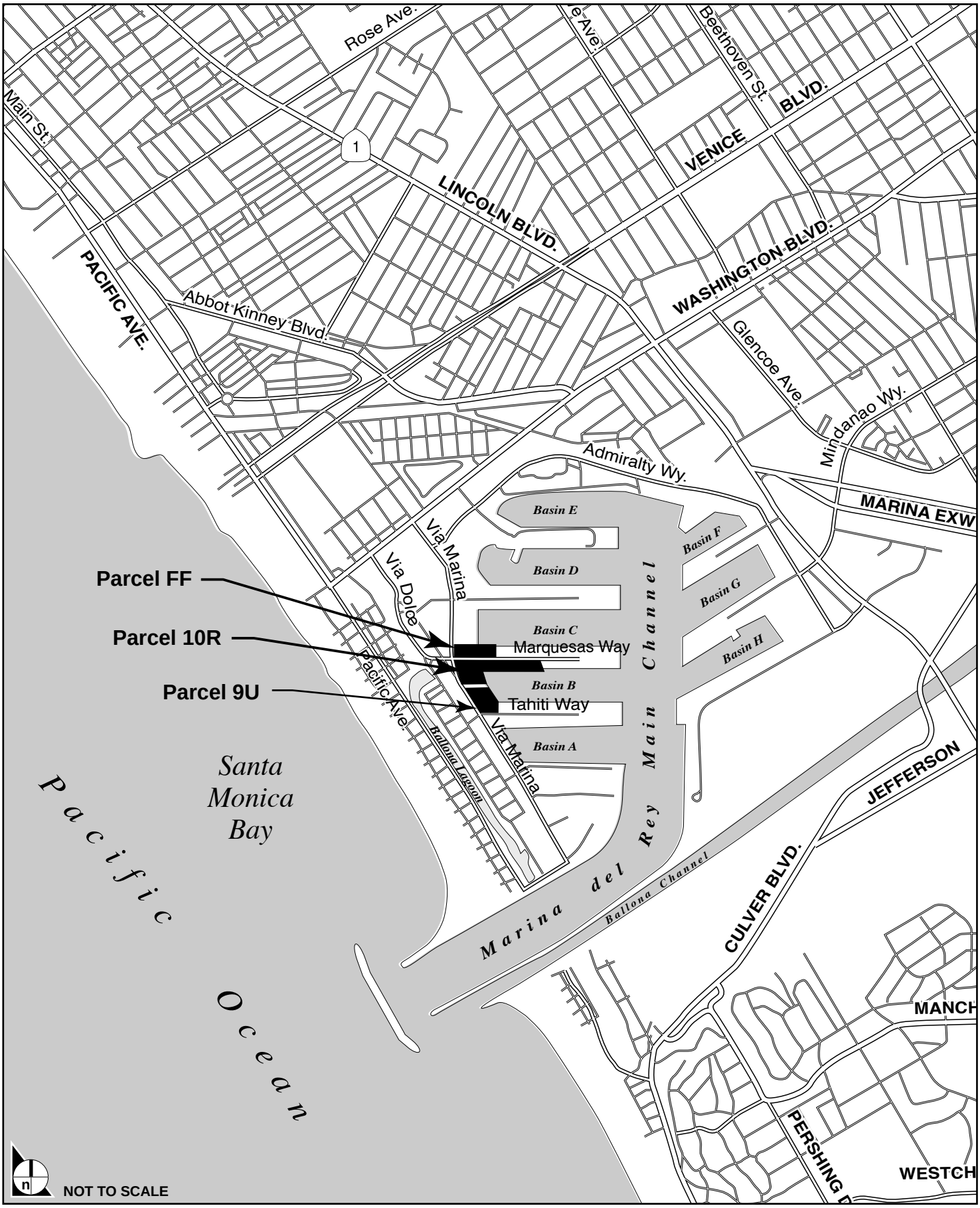


SOURCE: Impact Sciences, Inc. – October 2006

FIGURE **1**

Regional and Local Site Vicinity

460-04•10/06

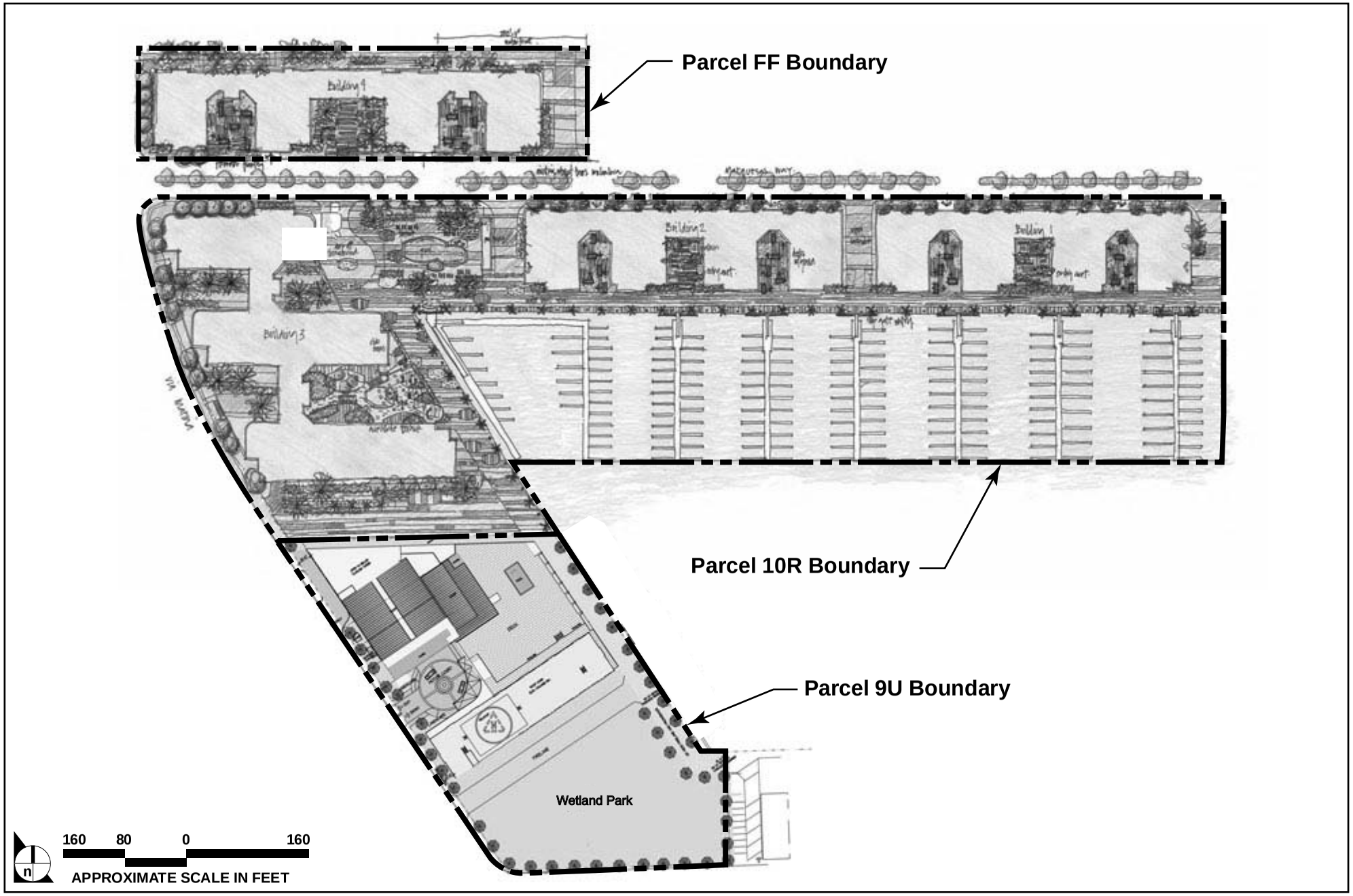


SOURCE: Impact Sciences, Inc. – October 2006

FIGURE **2**

Marina del Rey Parcels 10R, FF, and 9U

460-04•10/06



SOURCE: Thomas P. Cox: Architects, Inc. – March 2006, Gin Wong Associates – February 2006

FIGURE **3**

Conceptual Site Plan; Neptune Marina/Woodfin Suites Hotel/Timeshare

460-04•03/07

Component 1 includes the landside and waterside development of Parcel 10R and is referred to as "Neptune Marina Parcel 10R." Landside development consists of the removal of 136 existing apartment units and construction of a 400-unit, multi-family, residential apartment community consisting of three structures, 909 parking spaces and a waterfront public pedestrian promenade. Buildings 1 and 2, which front on the Marquesas Way mole road, would not exceed 55 feet, while Building 3, which fronts on Via Marina, would not exceed 60 feet (exclusive of appurtenant, screened rooftop equipment, parapets and architectural features) when measured from finished grade elevations along Via Marina and Marquesas Way. These structures front Marquesas Way and Via Marina and are located generally southeast of this intersection. The project would also include an approximately 0.25-mile-long (1,437 linear feet) public waterfront pedestrian promenade. Construction staging would occur on site and on Parcel FF.

The waterside portion of Parcel 10R would be comprised of a small craft anchorage consisting of 174 boat spaces that would replace an existing marina containing 198 boat spaces which have deteriorated over time. The anchorage would provide users with water and electrical service and a sewage pump out station. The 161 proposed private boat slips (in association with the Neptune Marina Project Parcel 10R) are wide enough to accommodate modern boat designs and boats up to 40 feet. Larger boats could be accommodated at the 13 proposed end-tie spaces (161 + 13 = 174 total marina spaces). Note that the reduction in 24 boat spaces between the existing 198-space marina and the proposed 174-space marina results directly from achieving compliance with California Department of Boating and Waterways and Americans with Disabilities Act standards and requirements.

Component 2 includes the development of Parcel FF and is referred to as "Neptune Marina Parcel FF." Development consists of a 126-unit, residential apartment community comprised of one structure and 243 parking spaces. The project would also include 200 feet of public waterfront pedestrian promenade, consistent with Local Coastal Program (LCP) requirements. Height of the proposed building (Building 4) would not exceed 55 feet (exclusive of appurtenant, screened rooftop equipment, parapets and architectural features) when measured from finished grade elevations along Via Marina and Marquesas Way. This structure would front on Marquesas Way, located generally northeast of this intersection. Construction staging would occur on-site and on Parcel 10R.

Component 3 includes the development of the northerly approximately 2.20 acres of Parcel 9U and is referred to as the Woodfin Suite Hotel and Timeshare Resort. This project component is comprised of a hotel/timeshare resort with 288 hotel and timeshare suites (152 conventional hotel suites and 136 timeshare suites) and an assortment of accessory patron- and visitor-serving uses (including a waterfront restaurant with indoor and outdoor/terrace dining areas, cocktail lounge, resort pool and spa and sundry shop) contained in a 19-story structure on the southern side of the resort complex. Consistent with LCP

building height requirements for Parcel 9U, the height of the tower would not exceed 225 feet (exclusive of appurtenant, screened rooftop equipment, parapets, and architectural features) when measured from the finished grade. The resort structure is planned on the northern portion of Parcel 9U and fronts Via Marina. Like Components 1 and 2, the project would also include a public waterfront pedestrian promenade and structured parking (360 parking spaces) for the hotel/timeshare resort (the resort parking garage would adjoin and be sited northerly of the hotel/timeshare resort structure).

Component 4 consists of a 1.46-acre restored public wetland and upland park that would be constructed on the southern portion of Parcel 9U. This represents a significant new public environmental and recreational park amenity for the Marina del Rey LCP and Marina del Rey community.

Component 5 consists of a public transient boat anchorage that would be situated proximal to Parcel 9U within Marina del Rey Basin B. This public anchorage would contain approximately 2,923 square feet of dock area and would provide approximately 524 linear feet of transient boat docking space. It is estimated that the public anchorage will be able to provide berthing for between 7 and 11 "transient" boats (depending on the size of the vessels using the anchorage at any time) plus three side-ties for smaller dinghy boats at the north end of the public anchorage. Similar to the public wetland park proposed for development on the southerly portion of Parcel 9U, this public anchorage represents a significant new public boater-serving amenity for the Marina del Rey Local Coastal Program and Marina del Rey community.

The Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort project would, therefore, consist of 526 residential dwelling units, 288 hotel and timeshare suites with accessory patron- and visitor-serving uses, 174 private and up to 11 public or "transient" boat spaces and a 1.46-acre restored public wetland and upland park. At present, there are 136 existing apartment units and 198 boat spaces on Parcel 10R and a surface parking lot containing 206 parking spaces on Parcel FF. Parcel 9U is a vacant, fenced parcel containing the remains of an abandoned hotel construction project. A depression occurs on Parcel 9U that has, over time, developed into a low-quality wetland of 0.47 acre under the Coastal Act regulations. Therefore, completion of the proposed project would result in a net increase of 390 apartment units, 288 hotel and timeshare suites, berthing spaces for approximately 185 boats (as many as 11 of which will be public/"transient" boat spaces), and a 1.46-acre public park consisting of 0.47 acre of restored wetland and 0.99 acre of upland park area.

For the apartment and hotel/timeshare project components, emphasis has been placed on a design that balances public and private views of the marina and enhancement of the pedestrian experience adjacent to the water. A major feature of the project that unifies and integrates the residential units, the

hotel/timeshare resort, the public wetland and upland park and the adjacent marina is a 28-foot-wide public pedestrian walkway between the buildings and the anchorage, the "Waterfront Stroll Promenade."

1.2.1 Components 1 and 2: Neptune Marina

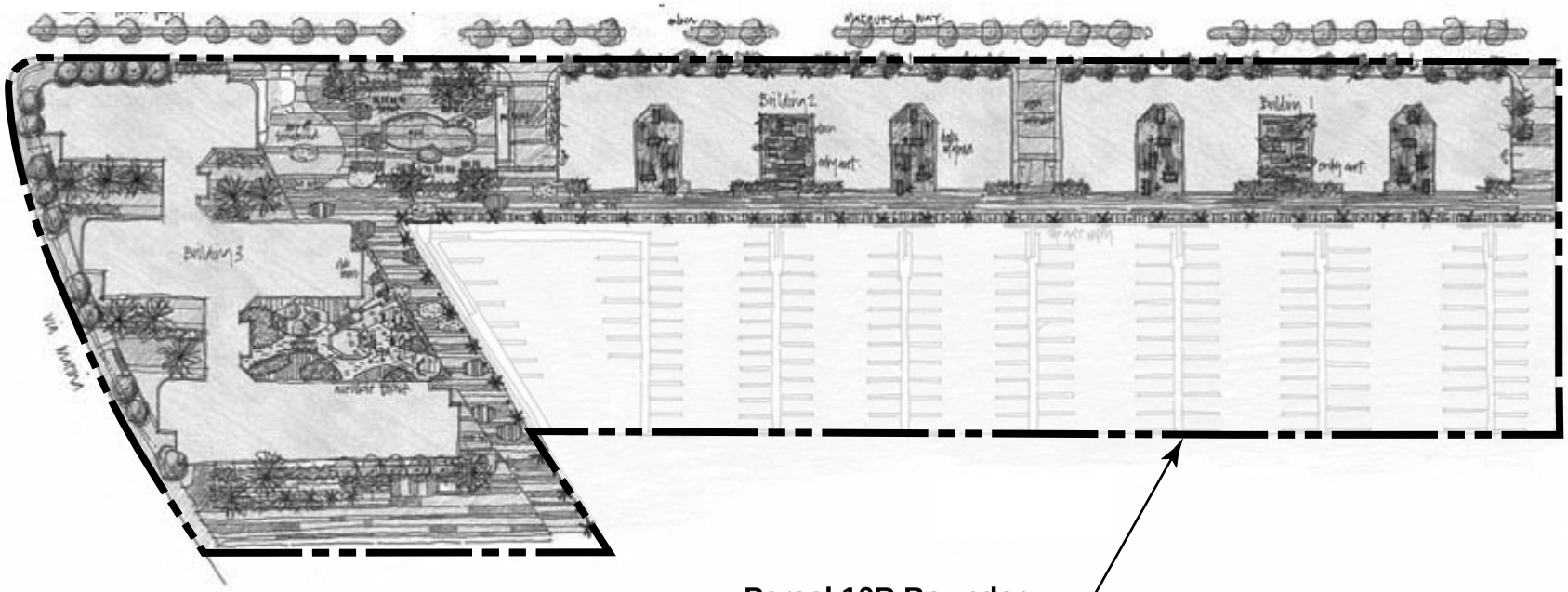
1.2.1.1 Residential Units: Neptune Marina Project (Parcels 10R and FF)

As proposed, the Neptune Marina Apartments and Anchorage consists of four new residential structures with each being four stories above two levels of parking (six total levels). Three buildings (Buildings 1, 2 and 3) are situated on Parcel 10R and south of Marquesas Way, while one building (Building 4) is situated north of Marquesas Way on Parcel FF (**Figure 3**). Within the four structures, 526 residential units are proposed that include rental apartment and rental townhome units. The design of the residential component of the project emphasizes a relationship to the waterfront. Building orientations have been configured to ensure direct pedestrian access to the Waterfront Stroll Promenade, a portion of which fronts on the proposed Neptune Marina Anchorage (Parcel 10R only). There are multiple points for the public to have unimpeded access to the Waterfront Stroll Promenade and the marina. The apartment structures have been separated to the maximum extent feasible to allow for unobstructed view corridors, consistent with LCP requirements.

One- and two- bedroom rental units are proposed in 11 different floor-plan configurations. As defined above, 526 residential units are planned. Of these, 330 are one-bedroom units; and 196 are two-bedroom units. Units will range in size from 650 to 1,691 square feet.

1.2.1.2 Boat Anchorage: Neptune Marina Project (Parcel 10R)

The proposed Neptune Marina Anchorage, a component of the Neptune Marina, is illustrated on **Figure 5**. Within Basin B, a new anchorage would be developed waterside of Buildings 1, 2, and 3 (Parcel 10R) and would be constructed concurrent with the apartment buildings. The existing 198-boat-space anchorage would be removed and replaced with 174 new spaces (a net reduction of 24 spaces). One hundred fifty of the 174 proposed spaces would accommodate boats 34 feet or less, with 24 spaces accommodating boats 35 feet in length or more. Maximum slip length would be 40 feet.



160 80 0 160

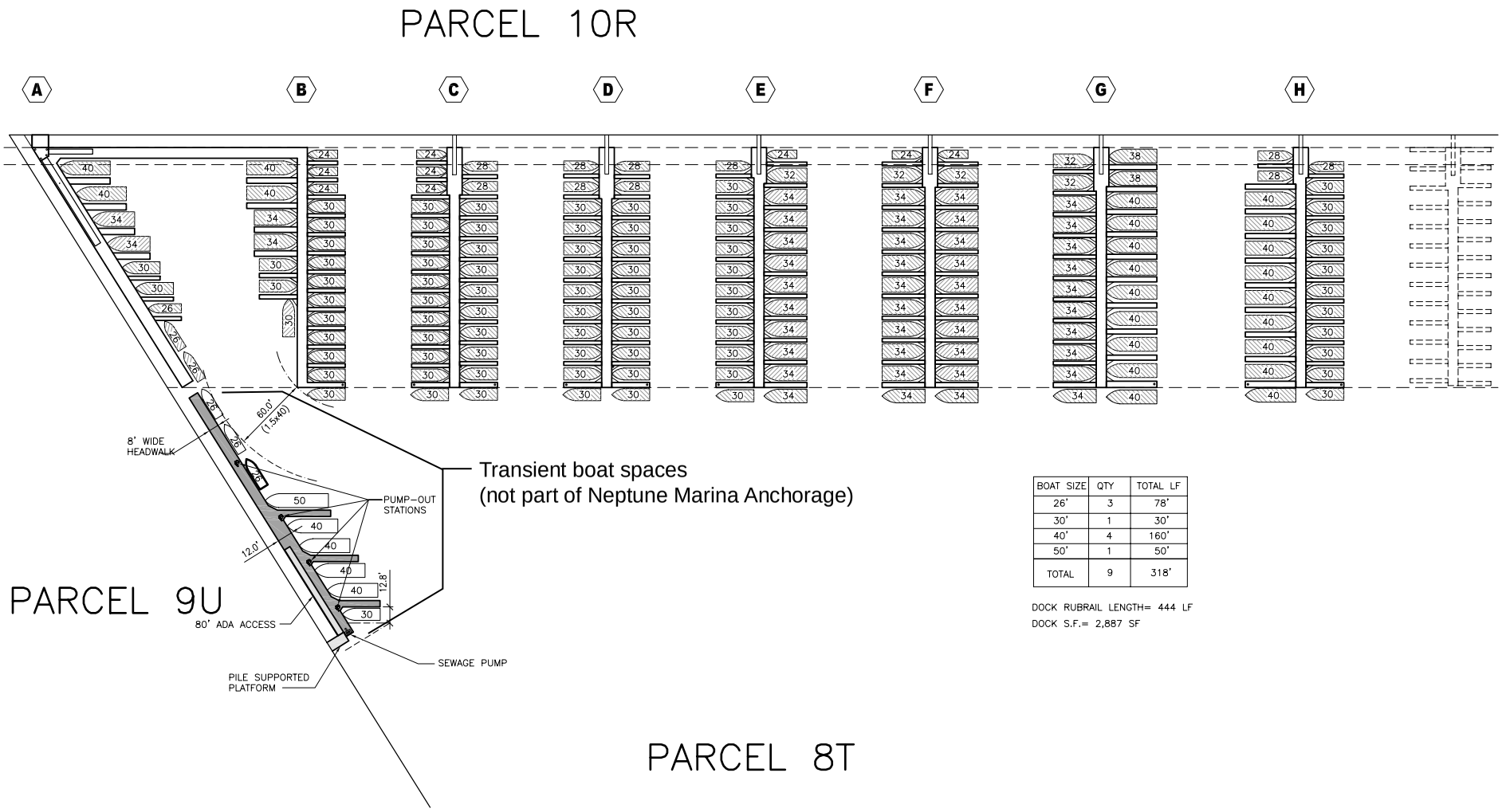
APPROXIMATE SCALE IN FEET

SOURCE: Thomas P. Cox: Architects, Inc. – April 2005

FIGURE **4**

Neptune Marina

460-04•10/06



BOAT SIZE	QTY	TOTAL LF
26'	3	78'
30'	1	30'
40'	4	160'
50'	1	50'
TOTAL	9	318'

DOCK RUBRAIL LENGTH= 444 LF
DOCK S.F.= 2,887 SF

80 40 0 80
APPROXIMATE SCALE IN FEET

SOURCE: C&A Architects. – July 2006

FIGURE **5**

Neptune Marina Anchorage

460-04•03/07

The new marina would replace the existing anchorage facilities with docks and spaces meeting current State of California Department of Boating and Waterways Guidelines for slip widths and federal requirements for Americans with Disabilities Act (ADA) compliance through use of an ADA gangway and ramp system, which would service a range of slip sizes. It is anticipated that the new docks would be constructed with current marina industry technology and materials (possibly a proprietary concrete dock system, with all new pre-stressed concrete guide piles and served with a new utility distribution system for power, water, cable and phone connections).

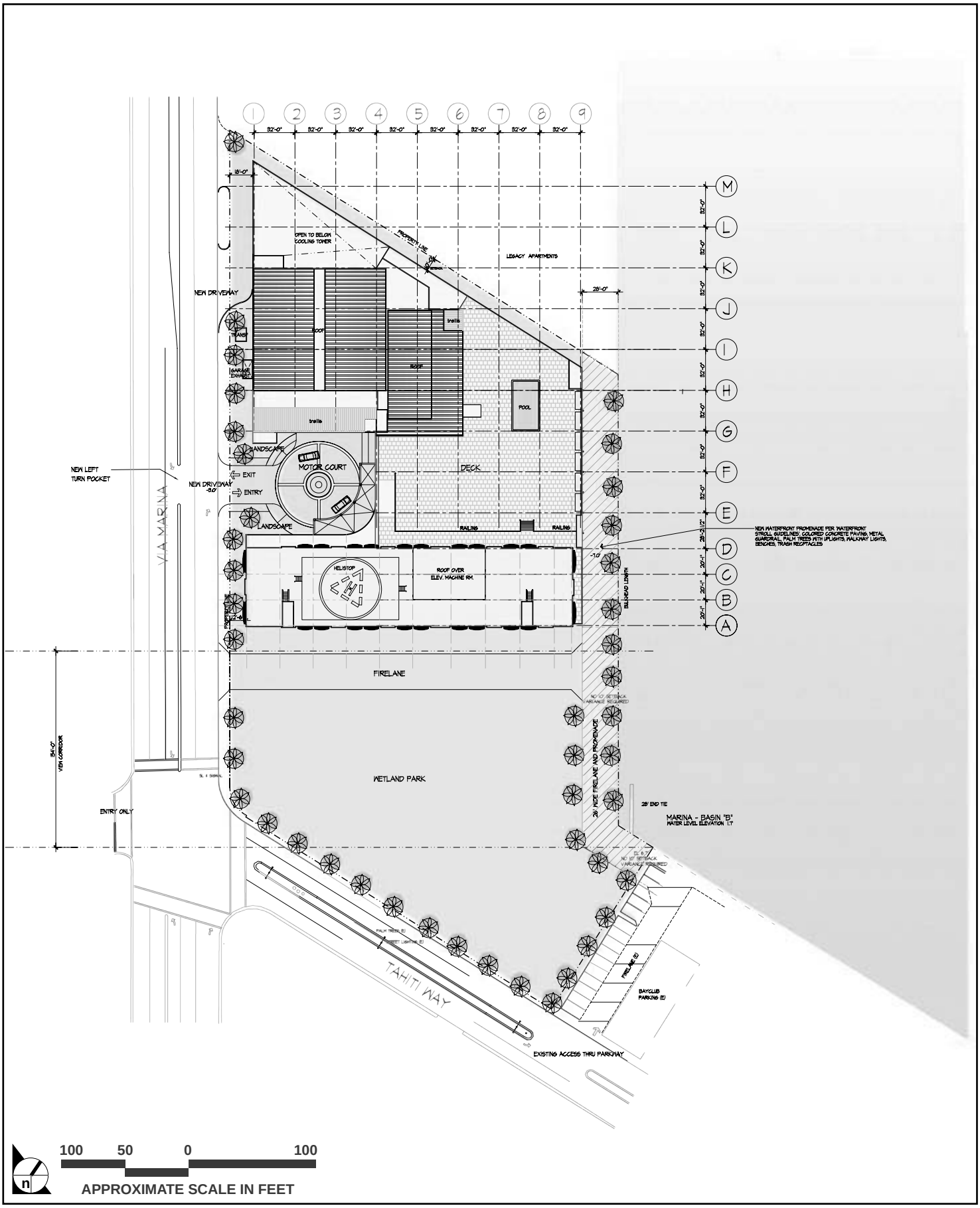
ADA requirements and modern boat dimensions (wider beam widths) necessitate the 24-space reduction defined above. In the anchorage, all utility lines would be concealed under the deck. The anchorage design utilizes electronically controlled gates and gangways to access the docks from the landside.

To promote clean water boating, sewage pump-out would be located in a central location that would serve the entire anchorage. Oversized storage facilities (dock boxes) would be provided at the anchorage to better serve recreational boaters.

1.2.1.3 Component 3: Woodfin Suite Hotel and Timeshare Resort (Northern Portion of Parcel 9U)

A site plan of the Woodfin Suite Hotel and Timeshare Resort is illustrated on **Figure 6**. The Woodfin Suite Hotel and Timeshare Resort consists of a 19-story building with 288 hotel and timeshare suite units and accessory uses, including meeting rooms, a restaurant and bar, a spa, a fitness center (including an outdoor pool), and associated hotel/timeshare operations space, such as the lobby, hallways, elevator shafts, mechanical rooms, offices, and laundry, maintenance and custodial facilities. The building would also feature an outdoor terrace and a large third floor deck with a pool, both of which would overlook the waters of the marina. In total, up to 21 fee-based "self-park" and 339 valet-managed parking spaces would be provided in a six-level parking garage, with one level below grade, for a project total of 360 parking spaces. The project also includes 386 linear feet of a public waterfront promenade.

Consistent with LCP building height requirements for Parcel 9U, the height of the hotel/timeshare structure would not exceed 225 feet (exclusive of appurtenant, screened rooftop equipment, parapets, and architectural features) when measured from the finished grade. The structure would front Via Marina and would be located south of the intersection of Via Marina and Marquesas Way and north of the intersection of Via Marina and Tahiti Way.



SOURCE: Gin Wong Associates – February 2006

FIGURE **6**

Woodfin Site Plan

460-04•03/07

Floors 1, 2 and 3 would include all accessory areas of the building, including loading areas, resort lobby and offices, a restaurant and bar, an exercise room, a pool, a spa, outdoor function areas, meeting rooms and a large conference room/ballroom.

The ground floor of the hotel/timeshare resort structure would include the lobby and registration/reception area, elevator bays, the business center, hotel offices, a resort restaurant and bar, kitchen, sundry shop, meeting rooms, and restrooms. The exterior of the ground floor of the resort would provide for hotel ancillary uses consisting of the motor court (drop-off and valet parking area), the entrance to the parking area, and service docks for truck loading.

Second floor uses would include a conference room/ballroom, meeting rooms, and hotel service and mechanical room space. The third floor of the building would contain an exercise room and a spa, both of which open to the pool deck. Meeting rooms also occur on the third floor of the hotel.

The tower portion of the building, incorporating portions of the second and third floors, and floors 4 through 19, would contain the 288 hotel and timeshare suites. Other uses on floors 4 through 19 would include the elevator lobby, a service lobby, and housekeeping rooms.

An emergency helistop is proposed on the roof of the hotel complex, consistent with County Fire and Zoning Code requirements. Other screened roof elements include mechanical equipment, chillers, cooling towers, a service room, elevator machine room, and an emergency generator and boiler.

1.2.1.4 Components 4 and 5: Public Wetland Park (Southern Portion of Parcel 9U) and Public Boat Anchorage (at terminus of Marina Basin B)

To account for the loss of Open Space-designated land that would occur as a result of planned development of Parcel FF with an apartment building, thereby precluding the potential future development of a public park at that site, a restored public wetland and upland park of 1.46 acres will be established on the southerly portion of Parcel 9U. The park will consist of a newly established "muted" tidal salt marsh in the center of the park, surrounded by a buffer of 25 feet from the actual wetland area toward both the proposed hotel/timeshare to the north and Tahiti Way on the south. The muted tidal salt marsh will be approximately 0.47 acre in size.

A jurisdictional delineation conducted by Glenn Lukos Associates (GLA) in 2005 identified approximately 0.47 acre of wetlands within the excavated basin, of which 0.26 acre consists of wetlands that exhibit positive indicators for wetland hydrology, hydrophytic vegetation, and hydric soils and an additional 0.21 acre that lacked positive indicators for at least one of the three criteria but would still be considered wetland pursuant to California Coastal Act policies.

A rehabilitation program for the basin would include re-contouring, removal of non-native species, enhancement of the hydrological regime through creation of a muted tidal connection, and establishment of native coastal salt marsh habitat appropriate to the area, including special-status species that would enhance the overall value of the wetland. In addition to the restoration of the 0.47-acre saltwater marsh, the open space areas surrounding the marsh would be planted with species indicative of native habitats along the California coast such as coastal prairie, coastal sage scrub, coastal bluff scrub, and maritime chaparral. These plantings will serve as a buffer for the saltwater marsh, and will provide educational opportunities for the public.

The area outside of the actual salt marsh will be planted in appropriate transitional vegetation and shall serve as a public open space area. A protective, non-view-obstructing fence will be installed in a location and manner deemed appropriate for the biological and visitor functions. Appropriate interpretive signage will be installed to enhance the visitor experience. A turf block area, which will include natural vegetation at the northerly end of the park, will provide a sturdy space for group lectures, seating for visitors bringing lawn chairs for bird watching and maintenance vehicles.

Expanded and enhanced coastal salt marsh habitat with fringing riparian scrub would be planted with the enhanced wetland area. The proposed low- and mid-marsh species would be planted in zones of appropriate wetness. Variations in microtopography within the basin will allow for establishment of mosaic of coastal salt marsh habitat. Upland areas surrounding the enhanced wetland will be planted with species native to coastal prairie, coastal sage scrub, coastal bluff scrub, and maritime chaparral habitats.

No lighting or parking shall be permitted within the park. Monitoring of the vegetation for five years is an integral part of the mitigation proposal. Monitoring would be the responsibility of the County of Los Angeles Department of Beaches and Harbors.

To further account for the loss of Open Space-designated land that would occur as a result of its development of Parcel FF with an apartment building, Legacy Partners will fund and develop a public/transient anchorage to adjoin the Parcel 9U bulkhead. This anchorage would comprise approximately 49,000 square feet or 1.12 waterside or submerged acres in the southwestern portion of Basin B, and would contain approximately 524 linear feet of new public dock area; it is estimated that the public anchorage would provide berthing for between 7 and 11 transient boats (depending on the boats' size), plus 3 side-tie spaces for smaller dinghy boats at the anchorage's northerly end. The new public boat and anchorage would be in compliance with ADA and Department of Boating and Waterways standards.

Under recognized park planning principles, improvement costs can be equated to land in the following way. The Subdivision Map Act requires new development to foster the creation of new local parks. The requirement may be met by the contribution of land, the contribution of land and improvements, or payment of an in lieu fee. In this case, the County of Los Angeles proposes to compensate for the loss of Open Space-designated land on Parcel FF (caused by Project Component 2) by a combination of land and improvements that exceeds the equivalent of 2.048 (2.05) acres (i.e., the amount of land area on Parcel FF that is being proposed for conversion from Open Space to a residential land use designation per Project Component 2). The calculation is described below.

The amount of the credit is equal to the amount of the land plus the value of the park/recreation improvements. The cost of restoring the wetlands and making other improvements to the wetland park is estimated to be $600,000, possibly including grading and other costs (although this will not be known until engineering plans are complete). As Legacy Partners (Applicant for Project Component 2) is paying for only half of the improvements (Woodfin Suite Hotels, LLC, the Applicant for Project Component 3, is paying the other half), Legacy Partners' contribution to the cost of these improvements is $300,000.

The $300,000 is then added to the estimated value of the 542 linear feet of proposed new dock space proposed for transient use waterside of Parcel 9U ($603,000), yielding $903,000. Next, this figure is divided by the value of an acre of parkland in the area in which the project is located, which at this time is $335,000 based on information from the County Department of Parks and Recreation for the West Los Angeles Parks Planning Area. Therefore, the improvement cost alone represents approximately 2.70 acres of credit (i.e., $903,000/$335,000 = 2.70 acres of credit), which is larger than the amount of designated Open Space on Parcel FF.

In addition to the cost of these improvements, the credit must necessarily include the area of the actual land of the wetland park. The total wetland park area is 1.46 acres.

The LCP does not prohibit counting parkland beneath the view corridor within the wetland park towards the compensation for the loss of the designated Parcel FF open space. The view corridor requirements of the Marina del Rey Specific Plan only require that such corridors maintain an unobstructed view of the bulkhead edge, masts, and horizon to pedestrians and passing motorists. Thus, it is the air space above the land that falls within the view corridor and not the land itself. As such, for example, parking lots are expressly allowed beneath such corridors, provided that the required views are maintained. If a project can satisfy parking requirements beneath a view corridor, it is clear that replacement open space requirements can also be met.

The Marina del Rey Specific Plan requires that new residential development provide compensatory recreational facilities to offset use of existing Marina park and recreational facilities. The Specific Plan expressly provides mitigation credit for public parkland. It also provides credit for those portions of public view corridors not designated for public access. Thus, the Specific Plan expressly allows view corridors to satisfy more than one regulatory requirement.

In addition, it is not uncommon under CEQA for a single mitigation measure to address more than one impact. For example, a traffic demand management plan can reduce vehicle trips, parking demand, mobile emissions, and mobile noise impacts. Similarly, the wetland park and view corridor above it can address potential project impacts with respect to wetlands, open space, public recreation, and compatibility with land use plans.

Including the area within the view corridor, the total credit for the land and improvements is 4.16 acres (1.46 acres of land + 2.7 acres of credit for the improvements = 4.16 acres). Even conservatively excluding the parkland within the view corridor, the total amount of credit for the land and improvements is 3.16 acres (0.46 acre of land + 2.7 acres of credit for the improvements = 3.16 acres). In either case, the amount of the credit far exceeds the 2.048 acres of designated Open Space on Parcel FF.

It should be noted that no water area (for the transient anchorage) is used in the above calculation, although the cost of constructing the docks is included due to the high value of the transient docks as a maritime dimension to the park as well as the clear priority in the LCP to create additional boat slips, especially public slips.

As set forth above, the combination of benefits to the public from these improvements (i.e., the restored wetland, upland park and transient boat anchorage) represents a significant public-boater-serving, open space and environmental asset and serves to mitigate for the loss 2.048 acres of designated Open Space that could possibly be used for a future park in Parcel FF. Moreover, the proposed location of a public park on Parcel 9U is superior to Parcel FF in that the subject Parcel 9U fronts a more heavily traveled street, Via Marina, and provides for more expansive and higher quality views of the basin than does Parcel FF.

1.3 Project Amenities and View Corridors

A major feature of the project that unifies and integrates the residential units, the hotel/timeshare resort, and adjacent marina is a pedestrian walkway between the buildings and the anchorage, the "Waterfront Stroll Promenade" (**Figure 7**). Located along the bulkheads of Marina Basins B and C, the 28-foot-wide Waterfront Stroll Promenade would feature color-patterned paving, pedestrian seating and marina-styled

fencing and lighting. The Waterfront Stroll Promenade would also feature landscaped planters and other landscape features constructed immediately adjacent to this pedestrian amenity. The length of the Waterfront Stroll Promenade would be approximately 1,437 feet on Parcel 10R, 200 feet on Parcel FF and 386 feet on Parcel 9U, totaling 2,023 linear feet. The entire length would be open to the public and could also be used for fire access to portions of the residential and hotel/timeshare resort buildings that face the water.

1.3.1 Amenities: Neptune Marina

The residential components of the Neptune Marina would feature a variety of recreational amenities, including a recreational lounge, game room and business center. In addition to these facilities, Building 1 would include offices for the harbormaster and leasing offices.

Outdoor recreational amenities would include landscaped decks and grounds adjacent to the Waterfront Stroll Promenade. An exterior pool is proposed between Buildings 2 and 3 (Parcel 10R). These exterior recreational areas would face the marina and would be connected directly to the public Waterfront Stroll Promenade via key-accessed secure gates.

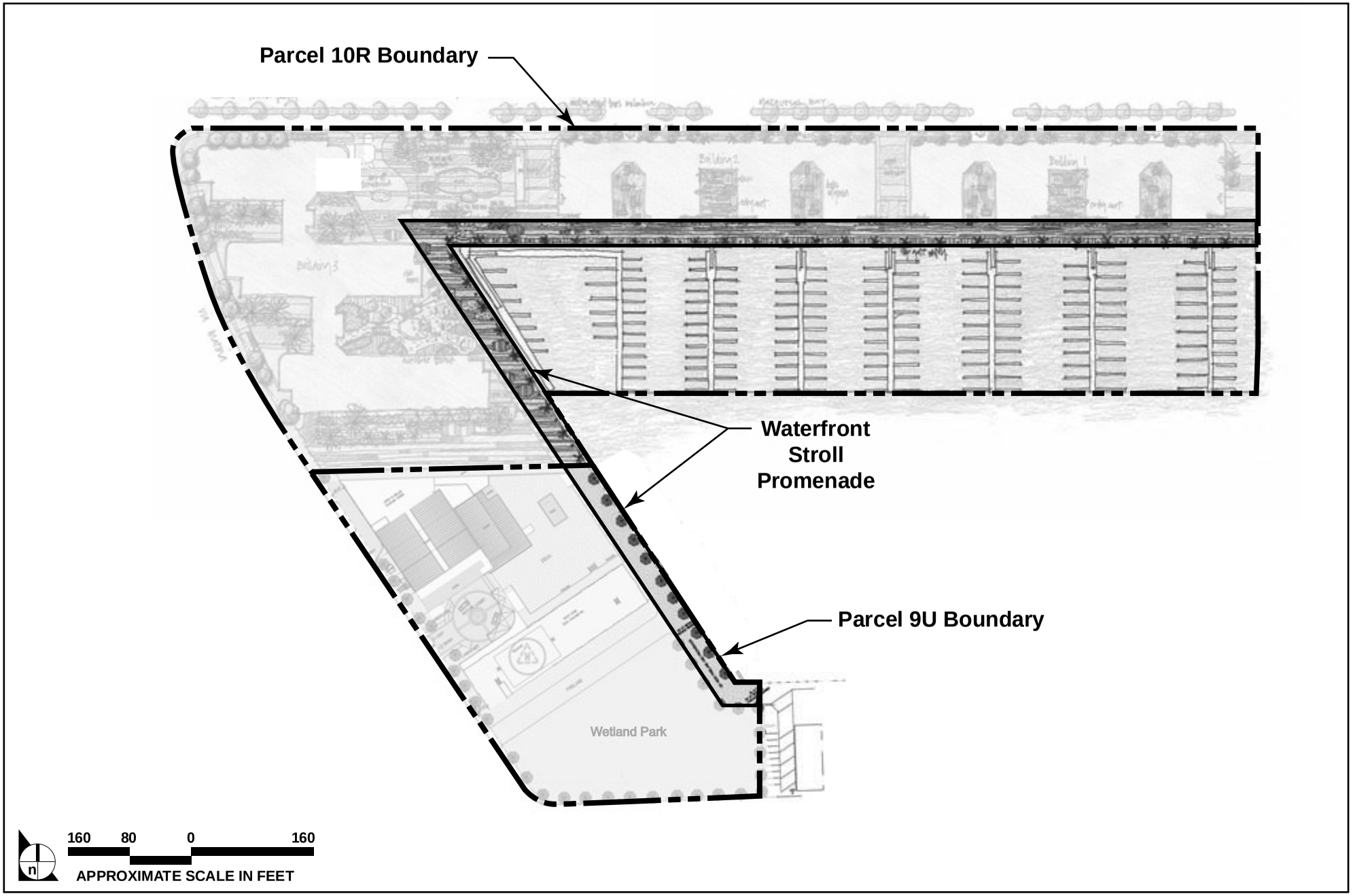
1.3.2 Amenities: Woodfin Suite Hotel/Timeshare Resort

The Woodfin Suite Hotel/Timeshare Resort would feature a variety of patron- and visitor-serving recreational amenities, including a recreational lounge, game room, exercise room, spa, and business center. Outdoor amenities would include a pool, landscaped decks, and terraces overlooking the Waterfront Stroll Promenade and the Marina.

The hotel/timeshare resort will feature landscaped planters and other features constructed immediately adjacent to the public Waterfront Stroll Promenade. Landscaped areas are also proposed along the western, eastern, and southern margins of the hotel and in various perimeter areas surrounding the hotel/timeshare resort structure.

1.3.3 View Corridors: Neptune Marina

The Neptune Marina (Parcels 10R and FF) incorporates five view corridors. Of the five view corridors, three corridors allow vistas of Marina del Rey Basin B from Marquesas Way (southerly); one corridor allows vistas of Marina del Rey Basin C from Marquesas Way (northerly). The fifth view corridor allows vistas of Marina del Rey Basin B from Via Marina (easterly).



SOURCE: Thomas P. Cox: Architects, Inc. – April 2005

FIGURE 7

Waterfront Stroll Promenade

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Provisions of the Land Use Plan (LUP) tabulate the area of required view corridor based on the length of the parcel's water frontage and the proposed building height. Based on the length of the parcel's water frontage and a proposed building height of 55 feet for Buildings 1, 2 (Parcel 10R), and 4 (Parcel FF) and 60 feet for Building 3 (Parcel 10R), the LUP requires a total of 413 linear feet of view corridor (360 feet for Parcel 10R and 53 feet for Parcel FF). As proposed, the Neptune Marina (Parcels 10R and FF) would provide 448.5 linear feet (388.5 feet for Parcel 10R and 60 feet for Parcel FF). As such, the Neptune Marina, as planned, is consistent with view corridor provisions of the Marina del Rey Land Use Plan that call for public and private views of the marina from perimeter roadways.

1.3.4 View Corridors: Woodfin Suite Hotel and Timeshare Resort

The Woodfin Suite Hotel/Timeshare Resort incorporates one major view corridor on Parcel 9U south of the hotel/timeshare resort structure. The primary view corridor allows vistas of Marina del Rey Basin B from Via Marina through the Parcel 9U public park/wetland. Per the LCP, based on the proposed 225-foot height of the structure (excluding appurtenant rooftop structures), a minimum 154-foot-wide view corridor is required (i.e., 40 percent of the parcel's water frontage). The Woodfin Suite Hotel/Timeshare Resort plans for 154 linear feet of view corridor through the Parcel 9U public park to be situated to the south of the proposed hotel/timeshare resort. Because the Woodfin Suite Hotel/Timeshare Resort provides the required 154 feet, the project is consistent with provisions of the LCP that call for public and private views of the marina from perimeter roadways.

As discussed above, the LCP allows the counting of parkland beneath the hotel/timeshare resort's view corridor within the wetland park toward the compensation for the loss of the designated Parcel FF open space.

1.4 Project Access and Parking

Vehicular access for the Neptune Marina and Woodfin Suite Hotel/Timeshare would be taken from 13 locations. In total, 1,507 parking spaces are required by code and 1,512 parking spaces would be provided in structured parking garages on the project sites. All parking garages would be screened by architectural and landscaping features, primarily by terraced, landscaped planters along the street and by landscaping along the promenade.

1.4.1 Access and Parking: Neptune Marina

For residents, vehicular access to and from the proposed residential components would be taken from 11 locations. Ten (10) points of access are located off Marquesas Way (7 to the south and 3 to the north). The one remaining point of vehicular access is located along Via Marina south of Marquesas Way. For

visitors, vehicular access to the interior portions of the Neptune Marina would be via four signed entrances on Marquesas Way. Vehicular access for boaters and users of the anchorage would be via one entrance on Via Marina (to the south). Pedestrian access to the buildings and the public Waterfront Stroll Promenade would be via a series of signed paved walkways between the buildings.

In each of the four proposed buildings, parking is provided in two-level garages built below each building. The lowest level of parking is entirely subterranean from the street side while the upper level of parking would be built at street grade. A total of 1,152 parking spaces would be provided throughout the Neptune Marina Parcels 10R and FF. Parking for apartment residents, their guests and the anchorage boaters would be segregated. Among the three user types, residents would be provided parking within the two-level garages through the use of security gate enclosures provided at both levels in all four buildings. Parking for guests is provided within the garages of each building. A parking area for boaters and users of the anchorage is provided in the southern end of the garage in Building 3 (on Parcel 10R).

1.4.1.1 Access and Parking: Woodfin Suite Hotel/Timeshare Resort

Vehicular access to and from the proposed Woodfin Suite Hotel/Timeshare Resort would be taken from two locations. One access point would be provided via Via Marina that provides an entry to the motor court and below grade parking structure. The second access point is also located along Via Marina (north of access to the motor court) that provides access to the service entry and loading docks.

Parking for the Woodfin Suite Hotel/Timeshare Resort would be provided in a six-level parking structure that is connected to the hotel lobby. A maximum of 360 parking spaces could be provided within this structure, 21 of which would be fee-based "self-park" spaces and the remainder of which would be managed by a professional valet parking company. Parking for the adjacent public wetland park can be conveniently accommodated within the hotel/timeshare resort's parking structure (County Code requires one parking space for the adjacent public park, whereas up to 21 self-park parking spaces are programmed for the hotel/timeshare resort parking structure).

1.5 The Project's Relationship to the Marina Del Rey Local Coastal Program (LCP)

All components of the Neptune Marina Apartments and Anchorage and Woodfin Suite Hotel and Timeshare Resort project meet the applicable policies and development standards of the certified LCP and/or County Zoning Ordinance, including, but not limited to, provision of adequate parking, view corridors, public access to the shoreline, and new usable public recreation and open space (waterfront public pedestrian promenade), complying with traffic capacity requirements and providing affordable housing consistent with the County's Affordable Housing Policy for Marina del Rey and Government

Code Section 66590, et seq. (the Mello Act). Certain project components, however, require the amendments to the Marina del Rey LUP and the Marina del Rey Specific Plan (the Specific Plan), as set forth below.

The discretionary approvals for the Neptune Marina Apartments project will include an LCP amendment request to change the land use designation under the LUP and Specific Plan on County Parcel FF from "Open Space" to "Residential V" (non-mole portion) and "Residential III" (mole portion) and to change the Height Category on County Parcel FF from "Height Category 1" to "Height Category 3." These changes will facilitate the conversion of the existing underutilized parking lot to residential use as expressly contemplated in Section A.2 of the LUP.

The potential future recreational facilities under the existing Open Space designation on Parcel FF will be effectively transferred to the southerly-most portion (approximately 1.46 acres) of County Parcel 9U, which will be developed with a restored public wetland and upland park. Moreover, as a public-serving complement to the Parcel 9U restored wetland and upland park, a public boat anchorage (containing approximately 524 linear feet of new public dock area and providing berthing for between seven and 11 transient boats, depending on the boats' size, plus side-tie area for smaller dinghy boats at the anchorage's northerly end) will be developed in Marina Basin B, alongside the Parcel 9U bulkhead.

Although Parcel FF is currently developed as a parking lot, it is currently designated as Open Space and could be developed in the future as a park. The loss of approximately 2.048 acres of potential unimproved future parkland will be offset through the development of the aforementioned 1.46-acre public wetland and upland park and adjoining public/transient boat anchorage. These public amenities would be provided at no cost to the County. Applicants Legacy Partners (Legacy) and Woodfin Suite Hotel, LLC (Woodfin) will each fund 50 percent of the costs of restoring the wetland and completing the other (landside) park improvements. Legacy will fund the entire cost of constructing the public/transient boat anchorage. The County Department of Beaches and Harbors has determined that Legacy's share of the public park and anchorage improvements is the equivalent of 2.70 acres of parkland, based on recognized park planning principles that equate improvement costs with unimproved land. The 2.70-acre credit, which is alone more than enough to offset the redesignation of the 2.048 acres of unimproved Open Space on Parcel FF, would be over and above the 1.46 acres on Parcel 9U which will be redesignated as Open Space.

LUP Section A.2. states that Parcel FF was originally contemplated for use as a future park in order to meet the recreational needs of new residents and to facilitate public use of and additional access along the harbor. It should be noted, however, that Section A.2 of the LUP (Page 2-5), under the "Potential Conversion of Public Parking Lots" subsection, also expressly acknowledges that Parcel FF is

underutilized by the public and is thus being contemplated for conversion to residential use: "Lots FF and OT, both on the west side of the Marina, are under utilized throughout most of the year**. They are being contemplated for development as residential uses.**" (emphasis added). By including a new 28-foot-wide pedestrian promenade as well as the public wetland park and public/transient boat spaces, the proposed project will meet the LUP's original intent for the Parcel FF Open Space designation. Moreover, the proposed location of a public park on Parcel 9U is superior to Parcel FF in that the Parcel 9U fronts a more heavily traveled street, Via Marina, and provides for greater water frontage for a park than one that could in the future have been built on Parcel FF (Parcel FF fronts primarily on Marquesas with only a small portion of the parcel fronting on Via Marina).

Both the public wetland park and the public/transient boat spaces will provide lower-cost visitor and recreational opportunities in furtherance of the policies and objectives of the LUP and the Coastal Act. The boat slips will add a waterside connection to the proposed public wetland park and adjacent resort, which will make it available to more users. In addition, providing additional boat spaces (especially public ones) is a top priority under Section A.3.e.1 of the LUP and is encouraged under Coastal Act Section 30224.

The discretionary project approvals will also include Legacy's LCP amendment request to modify the LUP and Specific Plan to allow the applicant to (a) contribute funds into the Coastal Improvement Fund (established by Section 22.46.1950 of the Marina del Rey Specific Plan) dedicated to parking structure construction, and (b) allow the applicant to occupy the new Parcel FF apartment building prior to construction of replacement parking spaces elsewhere in the Marina. The applicant will deposit funds into the Coastal Improvement Fund sufficient to construct the replacement parking with the County prior to issuance of a building permit. As set forth in Section A.2. of the LUP, and as confirmed by a parking use survey conducted by a licensed traffic engineering firm for Parcel FF (analysis of which to be included in the project Draft EIR), the existing Parcel FF parking lot is highly underutilized by the public, so deferring the construction of the replacement spaces is not anticipated to result in a shortage of parking in the area. As evidence of this, over half of the Parcel FF parking lot has, for the last six months, been fenced off from public use and utilized as a construction staging area for a nearby apartment development. During this time, the County Department of Beaches and Harbors has not received any complaints from the public indicating that the use of the parking lot for construction staging purposes has created a deficiency of public parking at the site or in the local area.

Legacy requires textual amendments to the LUP and Specific Plan to transfer 275 development units from the abutting Development Zone 2 (Tahiti Development Zone) and 112 development units from the proximate Development Zone 1 (Bora Bora Development Zone) into the subject Development Zone 3

(Marquesas Development Zone). This transfer of unclaimed residential unit credits from adjoining and nearby Development Zones is needed because the subject Marquesas Development Zone contains insufficient residential development unit entitlements to accommodate the Neptune Marina Apartments at Parcels 10R and FF (due to development of a new residential project on the adjacent Parcel 12 at the terminus of the Marquesas Way mole road having previously utilized all but three residential development credits in the Development Zone). There is clear precedent for such inter-development zone transfers on the western side of Marina del Rey (reference Goldrich & Kest Industries' LCP amendment approval at Marina Parcel 20, certified by the California Coastal Commission (CCC), which authorized the transfer of 97 development units from the Bora Bora DZ into the Panay DZ; reference County Case No. 98-172-4).

Finally, Legacy will seek an LCP amendment to amend the application of development standards contained in the Specific Plan to allow the applicant to average or "blend" residential densities over Parcels 10R and FF without respect to the 35 dwelling units/acre and 75 dwelling units/acre density development standards prescribed for the R-III and R-V land use categories. This will provide for uniform density and building massing and height across the parcels, rather than greater residential density, and resultant taller buildings, on the R-V-designated portion of the parcels.

1.6 Woodfin Suite Hotel/Timeshare Resort's Timeshare Component's Relationship to the Marina del Rey Local Coastal Program (LCP)

As noted, the Woodfin Suite Hotel and Timeshare Resort project component proposes development of a visitor-serving hotel and timeshare resort on the northerly portion of Parcel 9U, which is designated "Hotel-WOZ" in the Marina del Rey LCP. The Woodfin Suite Hotel and Timeshare Resort is consistent with the Marina del Rey LCP, which recognizes overnight lodgings as a primary visitor-serving use per Section 30213 of the California Coastal Act. While the Marina del Rey LCP does not define 'overnight lodgings' or 'hotel' within the document, several sections mention hotel use and may be drawn upon to determine consistency, as described below.

First, Section A.2. of the Marina del Rey LUP, "Recreation & Visitor-Serving Facilities" chapter, subsection e Policies and Actions, lists overnight lodgings as a qualifying visitor-serving use in accordance with related Coastal Act provisions.

Secondly, the LUP (Section A.2.e.5) also expressly exempts hotels from the mitigation requirements for new non-marine or non-coastal related uses, demonstrating a desire to facilitate new hotels and other overnight accommodations. The LUP explains that Marina del Rey contains a considerable mix of residential, and therefore the encouragement of hotels for visitor use is a clear objective of the LCP.

Thirdly, LUP Section C.8. Land Use Plan, subsection e Policies and Actions, Part 2 – Mapped Policy for the Land Use Plan, lists hotel as a permissible land use category and designates overnight accommodations and attendant visitor-serving uses including dining and entertainment areas as uses that may occur attendant to a hotel.

Finally, the LCP section addressing the Land Use Plan (see LUP Section C.8.e.7.) incorporates by reference language from the Countywide General Plan and Title 22, Planning and Zoning, Los Angeles County Code.

The Woodfin Suite Hotel and Timeshare Resort is consistent with the Marina del Rey LCP language addressing hotels and the Los Angeles County Code section as outlined above. The project is comprised of 288 hotel suites, of which 136 are timeshare suites; all of which are intended to or designed to be used on a temporary basis by guests. More importantly, the Woodfin Suite Hotel and Timeshare Resort will be a full-service facility, with a single set of support facilities (check-in desk, reception, restaurants, cocktail lounge, etc.) for both timeshare and hotel users. Therefore, there will be no distinction in terms of services between hotel patrons and timeshare patrons. This lack of exclusivity for timeshare guests is a key component in the determination of consistency by the County.

The proposed site of the Woodfin project has been the subject of numerous attempts to secure a hotel. All of the previous attempts have failed. The County is desirous of complying with the LCP's call for more overnight accommodations by establishing this suite hotel project. The Woodfin Suite Hotel and Timeshare Resort will enhance visitor-serving uses by providing much needed additional overnight accommodations through both the hotel and timeshare component.

- The timeshare suites will not be in a separate tower from the hotel suites; rather, both the hotel and timeshare suites will be on same floors (4 through 19).
- Rental of both the timeshare suites and hotel suites will be handled in a similar manner by on-site management (electronic keys issued by the front desk, concierge services, housekeeping, and front desk check-in/out).
- Timeshares will be made available to the general public through the hotel reservation system when not used by timeshare vacationers.
- Timeshare vacationers may make their unused timeshare suites available to the general public.
- Timeshare suites will be marketed through an exchange program and through the hotel, and will be rented at comparable rates to equivalent hotel suites.
- Timeshare suites will be sold in one-week intervals.
- The Woodfin timeshare component will remain a commercial use and will comply with the timeshare laws governed by the California Department of Real Estate.

In addition to overnight accommodations, the project will develop other visitor-serving uses to significantly enhance use and enjoyment of the Marina and coastal resources. These uses include a restaurant, cocktail lounge, pool, spa, conference facilities, new promenade, and wetland park, all of which will be accessible to the public. The new promenade and wetland park will offer no-cost visitor recreation to the public. In recognition of the delineated priorities of the Marina del Rey LCP, the project will not detract from, nor interfere with existing boating activities or ancillary boating support facilities. The project's abundant visitor-serving opportunities support the economic viability of the marina by encouraging increased public access.

Moreover, in order to further augment lower-cost public serving uses on the westerly side of the Marina, and should adequate parking be identified, an opportunity exists for two to three of the transient slips at the public anchorage proposed for development adjacent to the site to be used for charter and excursion boats. These excursion opportunities could constitute an important new public/visitor-serving feature on this side of the marina, as no such services are provided in this primarily residential portion of the marina. Therefore, the proponent of the proposed hotel/timeshare resort project (Woodfin Suite Hotels, LLC), which would administer any potential future charter use at the adjoining public anchorage, may make application for the charter boat use at a future date after occupancy of the hotel/timeshare resort, when the actual performance of the resort may be evaluated to determine that sufficient parking can be provided in the resort or in another location to service the charter use.

Finally, enhanced coastal access and harbor view opportunities are priorities indicated in the New Development section of the LCP. The Woodfin Suite Hotel and Timeshare Resort provides an abundance of enhanced coastal access and harbor view opportunities. The project includes a 28-foot public pedestrian promenade along the waterfront. The project is designed so that all suites will have views either to the marina or the ocean. Also, a view corridor of no less than 40 percent will be provided over the southerly portion of the parcel.

2.0 ENVIRONMENTAL IMPACT REPORT

In conformance with Section 15063 of the implementing *State CEQA Guidelines* (California Code of Regulations Title 14, Chapter 3), the County of Los Angeles prepared an Initial Study (**Attachment A**) and determined that the project had the potential to result in significant adverse impacts, and consistent with Section 15063(b)(1)(A), required the preparation of an EIR. The following analysis will be included in this EIR.

2.1 Environmental Setting

The *State CEQA Guidelines* require a description of the environment, as it exists, from both a local and regional perspective. In addition to describing the physical characteristics of the existing environment, an analysis of the project's consistency with all applicable local and regional plans will be provided.

2.2 Impact Analyses

Scopes of work for each required topic defined as part of the County prepared Initial Study are provided below. These scopes of work may be modified as necessary based on information received as part of this NOP process or as deemed appropriate by the County of Los Angeles. The following areas were identified in the Initial Study as having potential impacts that required additional analysis:

<u>Potential Hazards</u>

Geotechnical and Soil Resources

Flood and Tsunami Inundation

Noise

<u>Impacts to Resources</u>

Hydrology and Water Quality

Air Quality

Visual Resources

Biota

<u>Impacts on Services</u>

Traffic and Access

Water Service

Sewage

Education

Fire

Solid Waste

Other Factors

Environmental Safety

Population and Housing

Land Use

3.0 WORK SCOPES

3.1 Geotechnical and Soil Resources

The following scope of work is proposed to define and evaluate this project's potential adverse effect on the geology/soils environments.

1. Incorporate the available geotechnical, geologic and soils information developed from the literature. This discussion shall include a description of existing earth materials, geologic units, and seismic hazards.

2. Based on information provided by the applicant, describe and analyze proposed grading and manufactured slopes and general areas of cut and fill will be discussed.

3. Based on the conclusions of the geotechnical investigation, potential impacts will be analyzed as follows:

    a. Document the locations of the nearest active faults and determine whether there would be any hazards related to fault rupture.

    b. Determine whether people or structures would be exposed to significant effects from ground shaking, ground failure, or landslides.

    c. Discuss the potential for erosion-related impacts from grading and with regard to the drainage on site.

    d. Discuss the potential for the project to be located on an unstable geologic unit or soil with the associated hazards.

    e. Discuss soils constraints (expansive soils, corrosive soils) related to structural development.

    f. Discuss hazards associated with methane gas as it occurs in subsurface soils on and proximal to the project site.

4. Incorporate recommendations and mitigation measures from the geotechnical investigation and document their effectiveness at reducing impacts.

3.2 Flood and Tsunami Inundation

1. Incorporate the available hydrological information developed from the literature. This shall include a description of existing subsurface water levels and the potential for flood hazards.

2. Evaluate the potential for flooding and tsunami inundation. Discuss public notification in the result of a tsunami.

3. Based on the conclusions of the hydrological and geotechnical investigation, potential tsunami inundation impacts will be analyzed as follows:

    a. Document the locations of the significant active faults and determine possible tsunami hazards related to fault rupture.

    b. Determine whether people or structures would be exposed to significant effects from seawater velocities and inundation.

4. Incorporate recommendations and mitigation measures from the hydrological investigation and document their effectiveness at reducing impacts.

3.3 Noise

The project site is located approximately 3 miles north of Los Angeles International Airport (LAX). Noise from jet traffic is audible. The site is situated in a dense urban area and existing noise sources are generally from vehicles. The following scope of work is proposed to define and evaluate this project's potential adverse effect on the noise environment.

1. A description of existing noise sources and the noise environment in the vicinity of the project site.

2. A summary of noise measurements on the project site and along roadways most affected by increases in project traffic.

3. Identification of noise-sensitive land uses or activities in the vicinity of the project site and along roadways providing access to and from the site.

4. A discussion of relevant noise policies, regulations, and standards, including those in the County General Plan and Noise Ordinance (for informational purposes).

5. A discussion of construction noise impacts, based upon proposed construction activities and scheduling information provided by the applicant. The Draft EIR shall evaluate noise impacts from construction based on the duration, nature, phasing, and level of various construction activities.

6. A description of typical noise generated by the project during operation. Noise generated by project-generated motor vehicle traffic on adjacent sensitive land uses would also be evaluated.

7. Noise modeling shall be conducted to assess increases in noise levels at adjacent noise sensitive locations.

8. Provide mitigation measures identified as necessary to avoid or reduce significant noise impacts with an evaluation of their effectiveness based on published technical documents.

9. Provide cumulative impact analysis and mitigation measures.

3.4 Hydrology and Water Quality

The project site is located in an area with a high water table and is near the waters of the marina. Dewatering of the site may be necessary during construction and pollutant run off is possible both during project construction and operation. The following scope of work is proposed to define and evaluate this project's potential adverse effect on the hydrology and water quality environments.

1. Analyze water quality management issues and review plans. The County shall require development of a Storm Water Pollution Prevention Plan (SWPPP) to guide water quality protection during the construction and post-construction phases, in compliance with the regulatory requirements of the construction and municipal storm water permit components of the National Pollution Discharge Elimination System (NPDES). New regulations being adopted by the Regional Board require treatment of 80 to 90 percent of mean annual rainfall. Compliance with these regulations is typically explained in a Storm Water Management Plan (SWMP), including how the proposed treatment measures will be monitored and maintained.

2. Characterize pollutants of concern under existing conditions and following development and assemble information regarding the local and regional regulations related to storm water quality management. The Draft EIR shall review the site design plans for consistency with regulatory criteria and suitability of water quality treatment measures proposed to avoid impacts to local drainage channels and off-site habitat. Where applicable, the Draft EIR shall identify additional opportunities and constraints that bracket selection of best management practices (BMPs) and recommend further measures that are appropriate for the project.

3. Assess impacts to groundwater recharge from the proposed project. Recharge to groundwater is typically reduced when development creates impervious surfaces over areas that were formerly permeable. Under this task the EIR will assess the magnitude and importance of existing recharge, evaluate how recharge will likely change as construction occurs and identify impacts and mitigation measures suitable for maintaining hydrologic support to retained drainage channels or local wells, if applicable. If appropriate, the Draft EIR shall also suggest BMPs to maintain recharge.

4. Describe any other direct, indirect, and cumulative impacts on water resources resulting from the proposed project and appropriate mitigation measures.

3.5 Air Quality

The project is situated in the South Coast Air Basin, a severe nonattainment area. Air quality standards, policies, and monitoring are the responsibility of the South Coast Air Quality Management District (SCAQMD). Wind issues are equally important in the Marina due to the prevalence of recreational sail boating. The following scope of work is proposed to define and evaluate potential adverse effect on the

air quality and wind environment during the project's construction and operation. This section will also discuss green building concepts and feasible measures incorporated into the project that would reduce air emissions.

1. Describe baseline air quality information, including area topography and meteorology and their influence over air quality, relevant state and federal ambient air quality standards, monitoring data—for the past five years—from the monitoring station(s) proximal to the project site, air quality trends and existing and reasonably foreseeable sensitive receptors near the development site or near roadways/intersections that could be affected by project traffic. Also, identify federal, state, and local regulatory agencies responsible for air quality policies, regulations, and standards that pertain to the project. Identify major existing sources of air pollutants in the project vicinity, including sources of toxic air contaminants or odorous emissions on the basis of inventory data compiled by the SCAQMD.

2. Describe the significance criteria/thresholds for evaluating air quality impacts from the SCAQMD *CEQA Air Quality Handbook*.

3. Based on available information from the project applicant, calculate potential emissions from demolition and construction activities related to the project. Include emissions from grading, excavation, and building construction. Consider construction haul trips and exhaust emissions from construction equipment. Compare estimated construction emissions with SCAQMD thresholds.

4. Calculate operational mobile and area source emissions for reactive organic gases, nitrogen oxides, particulates, and carbon monoxide using the most current URBEMIS model. Calculations associated with vehicle traffic will be based on the trip generation modeling documented in the traffic report. Compare the estimated emissions to the SCAQMD thresholds.

5. Discuss the potential for the combined emissions from the project and cumulative development to adversely affect air quality or impede attainment of air quality goals. Also, discuss whether the project would conflict with the most recent version of the *Air Quality Management Plan* and other applicable air quality plans. Apply SCAQMD significance criteria to determine the potential for cumulative air quality impacts.

6. Identify mitigation measures as necessary to reduce or avoid any potential project-specific or cumulative impacts to air quality and quantify their effectiveness based on methodologies available from SCAQMD and other sources.

7. Evaluate the potential for the structures to effect wind patterns in the marina that could adversely impact fresh breezes or sailing opportunities in the Marina area.

3.6 Visual Resources

The existing character of the project site will be changed with development of the proposed project. The proposed project is denser and taller than existing land uses. The following scope of work is proposed to define and evaluate this project's potential adverse effect on the aesthetic environment.

1. Describe the existing visual character of the project site, focusing on site features such as topography, vegetation, existing light sources and the site's relationship to nearby uses. Work will be based on site reconnaissance.

2. Provide text, documenting views from adjacent roadways and discuss project's consistency with existing and planned development in the area.

3. Summarize applicable policies or regulations related to visual quality, including policies from the County of Los Angeles General Plan and the Marina del Rey Specific Plan and the Design Standards. Emphasis shall be afforded to the project's consistency with County adopted view corridor requirements.

4. Through view simulations, evaluate the visual impacts of the proposed project with respect to defined significance criteria, focusing on changes to existing visual character, effects on views from area roadways.

5. Evaluate potential light, glare and shade/shadow impacts of the proposed project on existing visual character of the site or area.

6. Identify, as necessary, additional mitigation measures for avoidance or reduction of the identified visual impacts.

3.7 Biota

Impact Sciences will prepare the biological resources analysis for the EIR and will perform the following tasks:

1. Review of Existing Information – Available documentation pertinent to the terrestrial and marine biological resources within, or in the vicinity of, the project site will be reviewed and analyzed. This will include a review of the following: (a) the biology sections of the previous EIR documents; (b) previously prepared technical biological reports, and results of special-status species surveys; (c) the California Department of Fish and Game's Natural Diversity Data Base and the California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California database for the appropriate USGS 7.5-minute quadrangle map in which the site is located, as well as the surrounding eight quadrangle maps; and (d) literature pertaining to habitat requirements of special-status species potentially occurring on the project site. Special attention shall be afforded to two technical reports. The first report is titled *Biological Technical Report Parcel 9U, Marina del Rey, California*. The second report is titled *Conceptual Restoration Plan for a Degraded Artificial Wetland Associated with Parcel 9U*, Marina del Rey. Both of these reports were prepared by Glenn Lukos Associates and have been reviewed by staff of the Los Angeles County Department of Beaches and

Harbors. Each of these reports is available for public review at the Los Angeles County Department of Regional Planning, 320 West Temple Street, Los Angeles, California 90012.

2. Impact Analysis – Proposed development plans on the site will be reviewed and analyzed to determine project-specific impacts to terrestrial and marine biological resources. In particular, Impact Sciences will identify and quantify potential habitat loss or disturbance that may occur as a result of implementation of the proposed project. This evaluation will also include potential direct and indirect impacts to both common and special-status plant and animal species, locally important or other sensitive habitats, and other significant biological resources.

3.8 Traffic, Access and Parking

A preliminary report defining existing traffic conditions and parking on and near the project has been prepared. The intersections surrounding the site within Marina del Rey operate at good Levels of Service (LOS A to C). Some intersections outside of Marina del Rey that are likely to experience increased traffic exhibit traffic congestion problems and operate at fair to poor Levels of Service (LOS D to F). Site access will conform to all County of Los Angeles Fire Department standards for roadway widths, turning radii and road length and surface materials. Additionally, the project will be required to pay all applicable traffic impact mitigation fees. Additional parking has been proposed by the County of Los Angeles on an existing parcel situated just north of the project site or other locations deemed appropriate by the County. The following analysis would be incorporated into the proposed EIR to adequately address potential project and cumulative impacts to the traffic environment.

1. Study area, methods, and level of service standards;
2. Description of regional and local transportation network;
3. Existing traffic volumes and levels of service;
4. Programmed roadway improvements;
5. Relevant transportation and circulation features of the proposed project;
6. Trip generation, distribution, and assignment;
7. Project-specific impacts (increased congestion, hazards, emergency access, parking and conflicts with alternative transportation policies);
8. The impact of this project on existing and proposed levels of parking available in the western portion of Marina del Rey; and
9. Describe project-specific mitigation measures and cumulative impacts and mitigation measures.

3.9 Water Service

Domestic water flows are provided by Los Angeles County Water Management District 29. The water district has sufficient capacity to provide water to the proposed project. However, the Department of Public Works is currently planning and performing upgrades to the water supply system to increase capacity. A full analysis of current and planned water supply line capacity from water mains to the project site is necessary to adequately evaluate system capacity. The following analysis would be incorporated into the proposed EIR to adequately address potential project and cumulative impacts on the County water supply systems.

1. Provide information regarding on-site water system improvements and the existing capacity of the Marina del Rey water system as well as any planned improvements to the water supply system.

2. Based on readily available water consumption rates, calculate the project's estimated water consumption. Compare with the defined capacities of water system.

3. Provide mitigation measures proposed as part of the project or recommendations of the County of Los Angeles Department of Public Works. This section would also describe the potential use of recycled water for landscaping and water closets as well as other green building concepts. Describe cumulative impacts and mitigation measures.

3.10 Sewage

Domestic sewage flows from the project site are currently treated at the City of Los Angeles' (City) Hyperion Treatment Plant through a contractual agreement between the County and City. This plant has surplus capacity to serve new projects. However, a full analysis of sewer line capacity from the project site to sewer trunk lines is necessary to adequately evaluate system capacity. The following analysis would be incorporated into the proposed EIR to adequately address potential project and cumulative impacts on the County sewage treatment systems.

1. Obtain information on existing sewer capacity, assess the potential impacts of the proposed project, define specific standards, and provide input on appropriate mitigation measures.

2. Provide information on existing conditions for the treatment and disposal of domestic sewage via the existing sewage treatment system.

3. Provide information on the sewage treatment system's capacity for additional wastewater treatment and on any pending and proposed improvements to the system.

4. Based on readily available wastewater generation rates, calculate the project's wastewater generation. Compare with the defined capacities of the sewage treatment plant(s) and sewage system.

5. Provide mitigation measures proposed as part of the project or recommendations of the County of Los Angeles Department of Public Works. Describe cumulative impacts and mitigation measures.

3.11 Education

The following scope of work is proposed to define and evaluate this project's potential impacts on education service:

1. Each elementary school, middle school, and high school will be defined. The design capacity of each school will be identified and well as the current enrollment. Current mechanisms for school funding shall be defined.

2. Additional student generated as a result of project implementation will be defined. The impact on existing enrollment and school capacity will be assessed and impacts defined. Appropriate mitigation will be defined. Cumulative impacts shall also be addressed.

3.12 Fire

The following scope of work is proposed to define and evaluate this project's potential impacts on fire service:

1. Contact the Fire department by telephone/letter to obtain information on existing conditions, assess the potential impacts of the proposed project, define specific standards in regards to fire flows and site access, and provide input on appropriate mitigation measures.

2. Consult with the fire department to determine the degree of fire hazard associated with the project site and vicinity. Consider the requirements of the latest edition of the California Fire Code or other requirements defined by the fire department.

3. Discuss the proposed project's plans to supply water service to the site, and discuss the ability of the local water supply system to provide adequate fire flows to the project site.

4. Evaluate the proposed project's impacts on the ability of the Fire Department to provide services from existing Fire Department facilities and discuss impacts on Fire Department funding.

5. Provide mitigation measures proposed as part of the project or recommended by the Fire Department. Describe cumulative impacts and mitigation measures.

3.13 Solid Waste

Solid waste collection and transfer in unincorporated Los Angeles County is handled by private contractors. These contractors haul waste to a variety of sorting, recycling, and transfer stations and to local and regional landfills. This section would also describe additional recycling measures as other

green building concepts. The following analysis would be incorporated into the proposed EIR to adequately address potential project and cumulative impacts on solid waste services.

1. Provide information regarding on-site solid waste collection and transfer. Identify likely landfills that accept solid waste from Marina del Rey, discuss capacity of these landfills and current diversion rates of recyclables in Los Angeles County.

2. Based on readily available solid waste generation rates, calculate the project's estimated solid waste generation. Compare with the defined capacities of identified landfills.

3. Document hazardous materials or the generation of hazardous wastes associated with the project. Document policies and measures that would apply to the safe use and disposal of such materials.

4. Provide mitigation measures proposed as part of the project. Describe cumulative impacts and mitigation measures.

3.14 Environmental Safety

Historically, the project site was subject to oil and natural gas extraction activities. Oil and natural gas wells on site and in the project areas were removed per applicable state and federal standards prior to Phase I development in the early 1960s. No extraction activities currently occur on the project site. Natural gas extraction does occur in the site vicinity (to the south). To assess the potential effects of soil gas on future site residents the following methodology is proposed.

1. Soil gas surveys on the project site shall be assessed and reported in the Draft EIR in accordance with both the Advisory document titled Active Soil Gas Investigations, January 28, 2003, jointly issued by the Department of Toxic Substances Control (DTSC) and the California Regional Water Quality Control Board – Los Angeles Region (LARWQCB) (DTSC/LARWQCB Advisory), and the LARWQCB Interim Guidance for Active Soil Gas Investigations (February 25, 1997).

3.15 Population and Housing

1. A summary of existing and projected population, housing, and employment figures will be presented, based on available data including 2000 census data and 2004 State Department of Finance figures. The existing population, housing, and employment characteristics of the area will be addressed. This information will be presented concisely in text, tables, and graphics.

2. This section will also describe the anticipated direct and secondary population, employment, and housing effects that would result from buildout of the projects as proposed. Specifically, impacts on citywide population estimates as a result of proposed single and multi-family dwelling units will be addressed. We will utilize the County's updated Housing Element for housing policy direction.

3. These projections will be evaluated for consistency with City and Southern California Association of Governments (SCAG) growth projections for the area. In addition, because this project would be considered regionally significant, this section will discuss the project's consistency with SCAG's

Regional Comprehensive Plan and Guide, which has directed emphasis away from jobs/housing balance and instead emphasizes an equivalent reduction in vehicle miles traveled.

4. The land plan for the proposed projects will be evaluated with respect to the type and spatial arrangement of land uses, as well as the project's location relative to supporting commercial, recreational, and employment opportunities. Growth inducing impacts will be assessed in a separate section of the EIR as required by the *State CEQA Guidelines*.

3.16 Land Use

This analysis shall include an identification of this project's consistency with land use designations defined in the Marina del Rey Land Use Plan. In addition, the analysis shall include an evaluation of this project's consistency with applicable goals and policies as defined in the Marina del Rey Land Use Plan.

In addition, and as required by Section 15125(d) of the *California Environmental Quality Act CEQA Guidelines*, the analysis shall include an evaluation of this projects consistency with applicable goals and policies defined in the other local regional planning documents that include the Regional Comprehensive Plan and Guide as prepared by SCAG, the most recent Air Quality Management Plan as prepared by the South Coast Air Quality Management District, the Water Quality Control Plan (i.e., the Basin Plan) as prepared by the California Regional Water Quality Control Board (RWQCB) and the Congestion Management Program for Los Angeles County as prepared by the Los Angeles County Metropolitan Transit Authority (MTA).

3.17 Alternatives

In conformance with the *State CEQA Guidelines*, a range of reasonable alternatives that would reduce significant impacts and would foster informed decision making and public participation will be included in the Draft EIR.

3.18 Growth-Inducing Impacts

In conformance with the *State CEQA Guidelines*, growth-inducing impacts (i.e., ways the project could foster economic growth or population growth) either direct or indirect would be described and analyzed.

ATTACHMENT A

Initial Study

STAFF USE ONLY

PROJECT NUMBERS: *R2006-03647 (Parcel 10R)*
CASES: *R2006-03652 (Parcel FF)*
R2006-03644 (Parcel 9U)
TR067861 & R2006-03643 (Parcel 9U)

*** * * * INITIAL STUDY * * * ***

COUNTY OF LOS ANGELES
DEPARTMENT OF REGIONAL PLANNING

GENERAL INFORMATION

I.A. Map Date: *December 20, 2006* Staff Member: *Rick Kuo*

Thomas Guide: *671-J7* USGS Quad: *Venice*

Location: *Parcel 10R (SE corner of Via Marina and Marquesas Way), Parcel FF (near NE corner of Via Marina and Marquesas Way), Parcel 9U (NE corner of Via Marina and Tahiti Way), Basin B*

Description of Project: *Proposed project is the Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project on Parcels 10R, FF, and 9U as well as adjacent Marina Basins. The proposed project consists of five components requiring Coastal Development Permits, Plan Amendments, Conditional Use Permits, a Tract Map, and a Variance. Components 1 (Parcel 10R) and 2 (Parcel FF) consist of demolishing all existing apartment structures to build a total of 526 apartment units and two waterfront public pedestrian promenades. Component 3 is for the development of the northerly portion of Parcel 9U to construct a 19-story building with 288 hotel and timeshare suite units and accessory uses. The proposed building will include a six-level parking garage, with one level below grade, for a total of 360 parking spaces. Component 4 consists of a 1.46-acre public wetland and upland park on the southern portion of Parcel 9U. Component 5 is to construct a public transient boat anchorage that would be situated proximal to parcel 9U within the Marina Del Rey Basin B. This public anchorage would contain approximately 2,923 s.f. of dock area and would provide approximately 542 linear feet of transient boat docking space. Approximately 215,000 c.y. of grading will be required with excess cut material to be exported to the La Puente Landfill.*

Gross Area: *13.03 acres (landside) and 4.68 acres (waterside)*

Environmental Setting: *The project sites are located in the unincorporated Los Angeles County community of Marina Del Rey in its small craft harbor and are approximately 3/4 mile west of Lincoln Boulevard (State Route 1) and less than 3 miles from the Los Angeles International Airport. Surrounding land uses consist of single- and multi-family residences and commercial establishments. There is an existing apartment building consisting of 136 residential units and an existing marina consisting of 184 boat slips on Parcel 10R. Parcel FF is currently used as a parking lot with 100 spaces. Parcel 9U is vacant with artifically created wetland.*

Zoning: *Residential III and IV with Waterfront Overlay (Paarcel 10R); Open Space (Parcel FF); Hotel, Water, & Waterfront Overlay (Parcel 9U)*

General Plan: *Marina Del Rey Specific Plan*

Community/Area Wide Plan: *Marina Del Rey Land Use Plan*

Major projects in area:

Project Number	Description & Status
R2005-04106	*Addition of 69 new rooms to existing hotel (Pending).*
R2005-00728	*Sale of alcohol and expansion of existing parking lot (Pending).*
R2005-00234	*544-unit apartment community in 12 structures (Approved 6/7/06).*
CDP/CP3-029	*179 apartment units with density bonus (Approved 1/27/03).*
CDP/CP98134	*1022 apartment units/10,000 s.f. retail, 439 boat slips (Approved 12/6/00).*
CDP/CP98172	*99 apartment units, yacht club, offices, parking structure (Approved 10/2/00).*

NOTE: For EIRs, above projects are not sufficient for cumulative analysis.

REVIEWING AGENCIES

Responsible Agencies

- ☐ None
- ☒ Regional Water Quality Control Board
  - ☒ Los Angeles Region
  - ☐ Lahontan Region
- ☒ Coastal Commission
- ☒ Army Corps of Engineers
- ☒ *L.A. City Public Works*

Trustee Agencies

- ☐ None
- ☒ State Fish and Game
- ☐ State Parks
- ☒ *State Boating and Waterways*
- ☒ *State Land Commission*

Special Reviewing Agencies

- ☐ None
- ☐ Santa Monica Mountains Conservancy
- ☐ National Parks
- ☐ National Forest
- ☐ Edwards Air Force Base
- ☐ Resource Conservation District of the Santa Monica Mtns.
- ☒ *City of Los Angeles*
- ☒ *City of Culver City*
- ☒ *City of Santa Monica*
- ☒ *Los Angeles USD*
- ☒ *Coalition to Save the Marina*
- ☒ *Native American Heritage Commission*
- ☒ *Coast Guard*

Regional Significance

- ☐ None
- ☐ SCAG Criteria
- ☒ AQMD
- ☐ Water Resources
- ☐ Santa Monica Mtns. Area

County Reviewing Agencies

- ☒ Subdivision Committee
- ☒ DPW: *Traffic & Lighting, Geotechnical & Materials Engineering, Waterworks and Sewer Maintenance, EP*
- ☒ Health Services: *Environmental Hygiene*
- ☒ *Beaches and Harbors*
- ☒ *Sanitation Districts*
- ☒ *Sheriff's, Fire, Library*

IMPACT ANALYSIS MATRIX

CATEGORY	FACTOR	Pg	Less than Significant Impact/No Impact	Less than Significant Impact with Project Mitigation	Potentially Significant Impact	Potential Concern
HAZARDS	1. Geotechnical	5	☐	☐	☒	*Liquefaction area*
	2. Flood	6	☐	☒	☐	*Tsunami inundation area*
	3. Fire	7	☒	☐	☐	
	4. Noise	8	☐	☐	☒	*Construction, adjacent residential uses*
RESOURCES	1. Water Quality	9	☐	☐	☒	*Proximity to water bodies, NPDES*
	2. Air Quality	10	☐	☐	☒	*Parking lot and parking structure, construction*
	3. Biota	11	☐	☐	☒	*Removal of trees for nesting, wetlands restoration*
	4. Cultural Resources	12	☐	☒	☐	*Below grade excavation*
	5. Mineral Resources	13	☒	☐	☐	
	6. Agriculture Resources	14	☒	☐	☐	
	7. Visual Qualities	15	☐	☐	☒	*Height of proposed structure*
SERVICES	1. Traffic/Access	16	☐	☐	☒	*Cumulative impacts*
	2. Sewage Disposal	17	☐	☐	☒	*Increased demand for sewage service*
	3. Education	18	☐	☐	☒	
	4. Fire/Sheriff	19	☐	☐	☒	
	5. Utilities	20	☐	☐	☒	*Solid waste generation*
OTHER	1. General	21	☒	☐	☐	
	2. Environmental Safety	22	☒	☐	☐	
	3. Land Use	23	☐	☐	☒	*Plan Amendments sought*
	4. Pop./Hous./Emp./Rec.	24	☒	☐	☐	
	Mandatory Findings	25	☐	☐	☒	

DEVELOPMENT MONITORING SYSTEM (DMS) *

As required by the Los Angeles County General Plan, DMS shall be employed in the Initial Study phase of the environmental review procedure as prescribed by state law.

1. Development Policy Map Designation: *Category 2: Conservation/Maintenance*

2. ☐ Yes ☒ No Is the project located in the Antelope Valley, East San Gabriel Valley, Malibu/Santa Monica Mountains or Santa Clarita Valley planning area?

3. ☐ Yes ☒ No Is the project at urban density and located within, or proposes a plan amendment to, an urban expansion designation?

If both of the above questions are answered "yes", the project is subject to a County DMS analysis.

☐ Check if DMS printout generated (attached)

Date of printout: _____

☐ Check if DMS overview worksheet completed (attached)

*EIRs and/or staff reports shall utilize the most current DMS information available.

Environmental Finding:

FINAL DETERMINATION: On the basis of this Initial Study, the Department of Regional Planning finds that this project qualifies for the following environmental document:

☐ NEGATIVE DECLARATION, inasmuch as the proposed project will not have a significant effect on the environment.

An Initial Study was prepared on this project in compliance with the State CEQA Guidelines and the environmental reporting procedures of the County of Los Angeles. It was determined that this project will not exceed the established threshold criteria for any environmental/service factor and, as a result, will not have a significant effect on the physical environment.

☐ MITIGATED NEGATIVE DECLARATION, inasmuch as the changes required for the project will reduce impacts to insignificant levels (see attached discussion and/or conditions).

An Initial Study was prepared on this project in compliance with the State CEQA Guidelines and the environmental reporting procedures of the County of Los Angeles. It was originally determined that the proposed project may exceed established threshold criteria. The applicant has agreed to modification of the project so that it can now be determined that the project will not have a significant effect on the physical environment. The modification to mitigate this impact(s) is identified on the Project Changes/Conditions Form included as part of this Initial Study.

☒ ENVIRONMENTAL IMPACT REPORT*, inasmuch as there is substantial evidence that the project may have a significant impact due to factors listed above as "significant."

☐ At least one factor has been adequately analyzed in an earlier document pursuant to legal standards, and has been addressed by mitigation measures based on the earlier analysis as described on the attached sheets (see attached Form DRP/IA 101). The EIR is required to analyze only the factors not previously addressed.

Reviewed by: Rick Kino Date: 21 December 2006

Approved by: Daryl Koutnik Date: 21 DECEMBER 2006

☐ This proposed project is exempt from Fish and Game CEQA filling fees. There is no substantial evidence that the proposed project will have potential for an adverse effect on wildlife or the habitat upon which the wildlife depends. (Fish & Game Code 753.5).

☐ Determination appealed--see attached sheet.

*NOTE: Findings for Environmental Impact Reports will be prepared as a separate document following the public hearing on the project.

HAZARDS - 1. Geotechnical

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Is the project site located in an active or potentially active fault zone, Seismic Hazards Zone, or Alquist-Priolo Earthquake Fault Zone? *Potential active offshore fault 2 miles west of project site.*
b.	☐	☒	☐	Is the project site located in an area containing a major landslide(s)? *(State of CA Seismic Hazard Zones Map - Venice Quad).*
c.	☐	☒	☐	Is the project site located in an area having high slope instability?
d.	☒	☐	☐	Is the project site subject to high subsidence, high groundwater level, liquefaction, or hydrocompaction? *Liquefaction (State of CA Seismic Hazard Zones Map - Venice Quad).*
e.	☐	☒	☐	Is the proposed project considered a sensitive use (school, hospital, public assembly site) located in close proximity to a significant geotechnical hazard?
f.	☒	☐	☐	Will the project entail substantial grading and/or alteration of topography including slopes of more than 25%? *Approximately 215,000 c.y. of grading proposed with export.*
g.	☐	☒	☐	Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?
h.	☐	☐	☐	Other factors?

STANDARD CODE REQUIREMENTS

☐ Building Ordinance No. 2225 C Sections 308B, 309, 310 and 311 and Chapters 29 and 70.

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design ☒ Approval of Geotechnical Report by DPW

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on, or be impacted by, **geotechnical** factors?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

HAZARDS - 2. Flood

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Is a major drainage course, as identified on USGS quad sheets by a dashed line, located on the project site? *(State of CA Seismic Hazard Zones Map - Venice Quad).*
b.	☐	☐	☒	Is the project site located within or does it contain a floodway, floodplain, or designated flood hazard zone? *Project sites are in tsunami inundation area however impacts are considered to be less than significant.*
c.	☐	☒	☐	Is the project site located in or subject to high mudflow conditions?
d.	☐	☒	☐	Could the project contribute or be subject to high erosion and debris deposition from run off?
e.	☐	☒	☐	Would the project substantially alter the existing drainage pattern of the site or area?
f.	☐	☐	☐	Other factors (e.g., dam failure)?

STANDARD CODE REQUIREMENTS

☒ Building Ordinance No. 2225 C Section 308A ☒ Ordinance No. 12,114 (Floodways)
☒ Approval of Drainage Concept by DPW

☐ MITIGATION MEASURES / ☐ OTHER CONSIDERATIONS

☐ Lot Size ☐ Project Design

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on, or be impacted by **flood (hydrological)** factors?

☐ Potentially significant ☐ Less than significant with project mitigation ☒ Less than significant/No impact

HAZARDS - 3. Fire

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Is the project site located in a Very High Fire Hazard Severity Zone (Fire Zone 4)? *(LA County Safety Element - Wildland and Urban Fire Hazards Map).*
b.	☐	☒	☐	Is the project site in a high fire hazard area and served by inadequate access due to lengths, widths, surface materials, turnarounds or grade?
c.	☐	☐	☒	Does the project site have more than 75 dwelling units on a single access in a high fire hazard area? *Single means of access.*
d.	☒	☐	☐	Is the project site located in an area having inadequate water and pressure to meet fire flow standards? *Present water usage near limit.*
e.	☐	☒	☐	Is the project site located in close proximity to potential dangerous fire hazard conditions/uses (such as refineries, flammables, explosives manufacturing)?
f.	☐	☒	☐	Does the proposed use constitute a potentially dangerous fire hazard?
g.	☐	☐	☐	Other factors?

STANDARD CODE REQUIREMENTS

☐ Water Ordinance No. 7834 ☐ Fire Ordinance No. 2947 ☐ Fire Regulation No. 8

☐ Fuel Modification/Landscape Plan

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Project Design ☐ Compatible Use

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on, or be impacted by **fire hazard** factors?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

HAZARDS - 4. Noise

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Is the project site located near a high noise source (airports, railroads, freeways, industry)? *Project sites are approximately 3/4 mile west of Lincoln Boulevard (State Route 1) and less than 3 miles from Los Angeles International Airport.*
b.	☒	☐	☐	Is the proposed use considered sensitive (school, hospital, senior citizen facility) or are there other sensitive uses in close proximity? *Residential uses are adjacent to the proposed project sites.*
c.	☐	☐	☒	Could the project substantially increase ambient noise levels including those associated with special equipment (such as amplified sound systems) or parking areas associated with the project? *Operational noises typical of urban evironment.*
d.	☒	☐	☐	Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels without the project? *High density commercial and residential development.*
e.	☐	☐	☐	Other factors? _____

STANDARD CODE REQUIREMENTS

☐ Noise Control – Chapter 12.8 ☐ Building Ordinance No. 2225--Chapter 35

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design ☐ Compatible Use

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on, or be adversely impacted by **noise**?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

RESOURCES - 1. Water Quality

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Is the project site located in an area having known water quality problems and proposing the use of individual water wells?
b.	☐	☒	☐	Will the proposed project require the use of a private sewage disposal system? *Project sites will be served by the Los Angeles City Hyperion Treatment Plant.*
	☐	☐	☐	If the answer is yes, is the project site located in an area having known septic tank limitations due to high groundwater or other geotechnical limitations *or* is the project proposing on-site systems located in close proximity to a drainage course?
c.	☐	☐	☒	Could the project's associated construction activities significantly impact the quality of groundwater and/or storm water runoff to the storm water conveyance system and/or receiving water bodies? *Surface runoff from proposed project during construction may drain into the Marina.*
d.	☐	☐	☒	Could the project's post-development activities potentially degrade the quality of storm water runoff and/or could post-development non-storm water discharges contribute potential pollutants to the storm water conveyance system and/or receiving bodies? *NPDES permit required.*
e.	☐	☐	☐	Other factors?

STANDARD CODE REQUIREMENTS

☐ Industrial Waste Permit ☐ Health Code Ordinance No. 7583, Chapter 5

☐ Plumbing Code Ordinance No. 2269 ☒ NPDES Permit Compliance (DPW)

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on, or be impacted by, **water quality** problems?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

RESOURCES - 2. Air Quality

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Will the proposed project exceed the State's criteria for regional significance (generally (a) 500 dwelling units for residential uses or (b) 40 gross acres, 650,000 square feet of floor area or 1,000 employees for nonresidential uses)? *526 apartment units and 288 hotel rooms proposed.*
b.	☐	☒	☐	Is the proposal considered a sensitive use (schools, hospitals, parks) and located near a freeway or heavy industrial use?
c.	☒	☐	☐	Will the project increase local emissions to a significant extent due to increased traffic congestion or use of a parking structure, or exceed AQMD thresholds of potential significance per Screening Tables of the CEQA Air Quality Handbook? *Proposed project exceeds AQMD thresholds. Use of parking structure.*
d.	☐	☐	☒	Will the project generate or is the site in close proximity to sources which create obnoxious odors, dust, and/or hazardous emissions? *Temporary construction.*
e.	☐	☒	☐	Would the project conflict with or obstruct implementation of the applicable air quality plan?
f.	☐	☒	☐	Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?
g.	☐	☐	☐	Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?
h.	☐	☐	☐	Other factors:

STANDARD CODE REQUIREMENTS

☐ Health and Safety Code Section 40506

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Project Design ☒ Air Quality Report

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on, or be impacted by, **air quality**?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

RESOURCES - 3. Biota

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Is the project site located within a Significant Ecological Area (SEA), SEA Buffer, or coastal Sensitive Environmental Resource (ESHA, etc.), or is the site relatively undisturbed and natural?
b.	☐	☒	☐	Will grading, fire clearance, or flood related improvements remove substantial natural habitat areas? *There are no substantial natural habitat areas.*
c.	☐	☐	☒	Is a drainage course located on the project site that is depicted on USGS quad sheets by a dashed blue line or that may contain a bed, channel, or bank of any perennial, intermittent or ephemeral river, stream, or lake? *Artifically created wetland on-site.*
d.	☒	☐	☐	Does the project site contain a major riparian or other sensitive habitat (e.g., coastal sage scrub, oak woodland, sycamore riparian woodland, wetland, etc.)? *Artifically created watland on-site.*
e.	☐	☒	☐	Does the project site contain oak or other unique native trees (specify kinds of trees)?
f.	☐	☒	☐	Is the project site habitat for any known sensitive species (federal or state listed endangered, etc.)?
g.	☒	☐	☐	Other factors (e.g., wildlife corridor, adjacent open space linkage)? *Marine biota (brown pelican) may be disrupted.*

☒ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design ☐ Oak Tree Permit ☐ ERB/SEATAC Review

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on **biotic resources**?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

RESOURCES - 4. Archaeological / Historical / Paleontological

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Is the project site in or near an area containing known archaeological resources or containing features (drainage course, spring, knoll, rock outcroppings, or oak trees) which indicate potential archaeological sensitivity?
b.	☐	☒	☐	Does the project site contain rock formations indicating potential paleontological resources?
c.	☐	☒	☐	Does the project site contain known historic structures or sites?
d.	☐	☒	☐	Would the project cause a substantial adverse change in the significance of a historical or archaeological resource as defined in 15064.5?
e.	☐	☐	☒	Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? *New excavation below existing grade is proposed.*
f.	☐	☐	☐	Other factors?

☐ **MITIGATION MEASURES** / ☒ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design ☐ Phase I Archaeology Report

Historical resource aspect is in compliance with State Office of Historical Preservation guidelines.

CONCLUSION

Considering the above information, could the project leave a significant impact (individually or cumulatively) on **archaeological, historical**, or **paleontological** resources?

☐ Potentially significant ☒ Less than significant with project mitigation ☐ Less than significant/No impact

RESOURCES - 5. Mineral Resources

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?
b.	☐	☒	☐	Would the project result in the loss of availability of a locally important mineral resource discovery site delineated on a local general plan, specific plan or other land use plan?
c.	☐	☐	☐	Other factors?

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design

CONCLUSION

Considering the above information, could the project leave a significant impact (individually or cumulatively) on **mineral** resources?

☐ Potentially significant ☐ Less than significant with project mitigation ☒ Less than significant/No impact

RESOURCES - 6. Agriculture Resources

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? *(Los Angeles County Important Farmland 2002 Map).*
b.	☐	☒	☐	Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?
c.	☐	☒	☐	Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?
d.	☐	☐	☐	Other factors?

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design

CONCLUSION

Considering the above information, could the project leave a significant impact (individually or cumulatively) on **agriculture** resources?

☐ Potentially significant ☐ Less than significant with project mitigation ☒ Less than significant/No impact

RESOURCES - 7. Visual Qualities

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Is the project site substantially visible from or will it obstruct views along a scenic highway (as shown on the Scenic Highway Element), or is it located within a scenic corridor or will it otherwise impact the viewshed? *High density developments would block view of coastal areas.*
b.	☐	☒	☐	Is the project substantially visible from or will it obstruct views from a regional riding or hiking trail?
c.	☐	☒	☐	Is the project site located in an undeveloped or undisturbed area, which contains unique aesthetic features?
d.	☐	☒	☐	Is the proposed use out-of-character in comparison to adjacent uses because of height, bulk, or other features?
e.	☒	☐	☐	Is the project likely to create substantial sun shadow, light or glare problems? *19-story hotel towel on Parcel 9U.*
f.	☐	☐	☐	Other factors (e.g., grading or land form alteration):

☐ **MITIGATION MEASURES / ☐ OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design ☐ Visual Report ☐ Compatible Use

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on **scenic** qualities?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

SERVICES - 1. Traffic/Access

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Does the project contain 25 dwelling units, or more and is it located in an area with known congestion problems (roadway or intersections)? *526 apartment units and 288 hotel rooms.*
b.	☐	☐	☒	Will the project result in any hazardous traffic conditions? *High density development with single access.*
c.	☐	☐	☒	Will the project result in parking problems with a subsequent impact on traffic conditions?
d.	☒	☐	☐	Will inadequate access during an emergency (other than fire hazards) result in problems for emergency vehicles or residents/employees in the area? *Single means of access.*
e.	☒	☐	☐	Will the congestion management program (CMP) Transportation Impact Analysis thresholds of 50 peak hour vehicles added by project traffic to a CMP highway system intersection or 150 peak hour trips added by project traffic to a mainline freeway link be exceeded? *CMP thresholds exceeded.*
f.	☐	☒	☐	Would the project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?
g.	☒	☐	☐	Other factors? *Cumulative Marina traffic impacts.*

☒ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Project Design ☒ Traffic Report ☐ Consultation with Traffic & Lighting Division

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on the physical environment due to **traffic/access** factors?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

SERVICES - 2. Sewage Disposal

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☐	☒	If served by a community sewage system, could the project create capacity problems at the treatment plant?
				Large increase in population within the area.
b.	☒	☐	☐	Could the project create capacity problems in the sewer lines serving the project site?
				Increase in population may create capacity problems on current sewer system.
c.	☐	☐	☐	Other factors?

STANDARD CODE REQUIREMENTS

☐ Sanitary Sewers and Industrial Waste Ordinance No. 6130

☐ Plumbing Code Ordinance No. 2269

☐ MITIGATION MEASURES / ☐ OTHER CONSIDERATIONS

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on the physical environment due to **sewage disposal** facilities?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

SERVICES - 3. Education

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☐	☒	Could the project create capacity problems at the district level? *526 apartment units to be served by the Los Angeles Unified School District.*
b.	☐	☐	☒	Could the project create capacity problems at individual schools which will serve the project site?
c.	☐	☒	☐	Could the project create student transportation problems?
d.	☒	☐	☐	Could the project create substantial library impacts due to increased population and demand? *New residential development and increased population.*
e.	☐	☐	☐	Other factors?

☐ **MITIGATION MEASURES / ☒ OTHER CONSIDERATIONS**

☐ Site Dedication ☒ Government Code Section 65995 ☒ Library Facilities Mitigation Fee

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) relative to **educational** facilities/services?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impac

SERVICES - 4. Fire/Sheriff Services

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Could the project create staffing or response time problems at the fire station or sheriff's substation serving the project site?
b.	☐	☐	☒	Are there any special fire or law enforcement problems associated with the project or the general area? *Residential units and single means of access.*
c.	☐	☐	☐	Other factors?

☐ **MITIGATION MEASURES** / ☒ **OTHER CONSIDERATIONS**

☐ Fire Mitigation Fees

Nearest Fire station is less than a mile away at 4433 Admiralty Way, Marina Del Rey, CA 90292.

Nearest Sheriff's station is less than a mile away at 13851 Fiji Way, Marina Del Rey, CA 90292.

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) relative to **fire/sheriff** services?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

SERVICES - 5. Utilities/Other Services

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☐	☒	Is the project site in an area known to have an inadequate public water supply to meet domestic needs or to have an inadequate ground water supply and proposes water wells? *Current water usage near limit.*
b.	☐	☐	☒	Is the project site in an area known to have an inadequate water supply and/or pressure to meet fire fighting needs? *Current water usage near limit.*
c.	☐	☒	☐	Could the project create problems with providing utility services, such as electricity, gas, or propane?
d.	☒	☐	☐	Are there any other known service problem areas (e.g., solid waste)? *Solid waste generated by demolition/construction and operation of mixed-use retirement facility and commercial offices.*
e.	☐	☒	☐	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services or facilities (e.g., fire protection, police protection, schools, parks, roads)?
f.	☐	☐	☐	Other factors?

STANDARD CODE REQUIREMENTS

☐ Plumbing Code Ordinance No. 2269 ☐ Water Code Ordinance No. 7834

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Lot Size ☐ Project Design

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) relative to **utilities/services**?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

OTHER FACTORS - 1. General

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Will the project result in an inefficient use of energy resources?
b.	☐	☒	☐	Will the project result in a major change in the patterns, scale, or character of the general area or community?
c.	☐	☒	☐	Will the project result in a significant reduction in the amount of agricultural land?
d.	☒	☐	☐	Other factors? *Wind patterns may be altered; views to coastal areas may be obstructed.*

STANDARD CODE REQUIREMENTS

☐ State Administrative Code, Title 24, Part 5, T-20 (Energy Conservation)

☐ MITIGATION MEASURES / ☐ OTHER CONSIDERATIONS

☐ Lot size ☐ Project Design ☐ Compatible Use

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on the physical environment due to any of the above factors?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

OTHER FACTORS - 2. Environmental Safety

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Are any hazardous materials used, transported, produced, handled, or stored on-site?
b.	☐	☒	☐	Are any pressurized tanks to be used or any hazardous wastes stored on-site?
c.	☐	☒	☐	Are any residential units, schools, or hospitals located within 500 feet and potentially adversely affected?
d.	☐	☒	☐	Have there been previous uses that indicate residual soil toxicity of the site or is the site located within two miles downstream of a known groundwater contamination source within the same watershed?
d.	☐	☒	☐	Have there been previous uses which indicate residual soil toxicity of the site?
e.	☐	☒	☐	Would the project create a significant hazard to the public or the environment involving the accidental release of hazardous materials into the environment?
f.	☐	☒	☐	Would the project emit hazardous emissions or handle hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?
g.	☐	☒	☐	Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or environment?
h.	☐	☒	☐	Would the project result in a safety hazard for people in a project area located within an airport land use plan, within two miles of a public or public use airport, or within the vicinity of a private airstrip?
I.	☐	☒	☐	Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?
j.	☐	☒	☐	Other factors?

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

☐ Toxic Clean up Plan

CONCLUSION

Considering the above information, could the project have a significant impact relative to **public safety**?

☐ Potentially significant ☐ Less than significant with project mitigation ☒ Less than significant/No impact

OTHER FACTORS - 3. Land Use

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☒	☐	☐	Can the project be found to be inconsistent with the plan designation(s) of the subject property? *Plan Amendment for Parcel FF sought.*
b.	☒	☐	☐	Can the project be found to be inconsistent with the zoning designation of the subject property? *Relocation of public open space.*
c.				Can the project be found to be inconsistent with the following applicable land use criteria:
	☐	☒	☐	Hillside Management Criteria?
	☐	☒	☐	SEA Conformance Criteria?
	☐	☐	☐	Other?
d.	☐	☒	☐	Would the project physically divide an established community?
e.	☐	☐	☐	Other factors?

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on the physical environment due to **land use** factors?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

OTHER FACTORS - 4. Population/Housing/Employment/Recreation

SETTING/IMPACTS

	Yes	No	Maybe	
a.	☐	☒	☐	Could the project cumulatively exceed official regional or local population projections?
b.	☐	☒	☐	Could the project induce substantial direct or indirect growth in an area (e.g., through projects in an undeveloped area or extension of major infrastructure)?
c.	☐	☒	☐	Could the project displace existing housing, especially affordable housing?
d.	☐	☒	☐	Could the project result in a substantial job/housing imbalance or substantial increase in Vehicle Miles Traveled (VMT)?
e.	☐	☒	☐	Could the project require new or expanded recreational facilities for future residents?
f.	☐	☒	☐	Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?
g.	☐	☐	☐	Other factors?

☐ **MITIGATION MEASURES** / ☐ **OTHER CONSIDERATIONS**

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on the physical environment due to **population, housing, employment**, or **recreational** factors?

☒ Potentially significant ☐ Less than significant with project mitigation ☒ Less than significant/No impact

MANDATORY FINDINGS OF SIGNIFICANCE

Based on this Initial Study, the following findings are made:

	Yes	No	Maybe	
a.	☐	☒	☐	Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory? *Biota.*
b.	☐	☐	☒	Does the project have possible environmental effects which are individually limited but cumulatively considerable? "Cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. *Traffic, Air Quality*
c.	☐	☐	☒	Will the environmental effects of the project cause substantial adverse effects on human beings, either directly or indirectly? *Water Quality, Noise*

CONCLUSION

Considering the above information, could the project have a significant impact (individually or cumulatively) on the environment?

☒ Potentially significant ☐ Less than significant with project mitigation ☐ Less than significant/No impact

Transcript of Scoping Meeting April 23, 2007

NEPTUNE MARINA APARTMENTS

ANCHORAGE/WOODFIN SUITE HOTEL

AND

TIMESHARE RESORT PROJECT

SCOPING MEETING

Courtyard Marriott

Palos Verdes Room

13480 Maxella Avenue

Marina Del Rey, California

April 23, 2007

File No: S07931

Reported By: Anastasia Swinkles

MARINA DEL REY, CALIFORNIA

MONDAY, APRIL 23, 2007, 6:06 P.M.

LLOYD ZOLA: All right. We're ready to go.

It's actually going to be hard standing right at the podium. Can everybody in back hear me? Okay. One of the jobs I've had going through college was moving crowds at the music center. So I figure in a room this size, I can manage -- uh-oh. There we go.

Okay. I'd like to thank everybody for coming. My name is Lloyd Zola. I'm with HDR, and the reason you don't recognize that name from any of the project stuff is my one and only job on this project is to get you and everybody through this meeting.

I'm assisting Los Angeles County in conducting a scoping meeting for an Environmental Impact Report that's being prepared for the -- the Woodfin/Neptune Apartments project.

And what we'll do tonight is walk through, first: What is the application or what are the series of applications that we're discussing? What is a scoping session? What is it? What is it not? And then will be time for public input.

Now, the Los Angeles County Department of Regional Planning has received a series of

applications. And I think we have a handout out there that is the Notice of Preparation. There will be a list of applications, and those are filed for four parcels within Marina del Rey: parcels 10R, FF, 9U North, and 9U South.

And what the project includes is -- those applications are for removal of 136 existing apartment units and construction of a -- of a new 400-unit apartment project, replacement of an existing 198-space marina with a small craft anchorage that would be 174 spaces, and then a new 126-unit apartment project. So a total of 526 apartment units representing a net increase in 390 dwelling units.

Along with this, there is applications for 288 hotel room and timeshare unit in a resort setting, and that means 152 conventional hotel suites and 136 timeshare suites -- or timeshare units, a 1.46 acre restored wetland and upland park.

And one more thing. And transient boat anchorage for boats coming in and out, 7 to 11 boats depending on the size, that the transient anchorage could provide.

And you've seen boards that -- that display the project and some of the buildings, and then also there's this -- a more detailed description in the

Notice of Preparation, and that's the bound document that was out front.

Now, this series of requests to the Department of Regional Planning require the county to take what are called discretionary actions meaning that the county has the discretion to approve the projects, to deny the projects, to approve them with conditions.

And because they have that discretion, state law requires that the county review the environmental affects of those applications. And the law that we're going to be dealing with and the law that has us all here tonight is the California Environmental Quality Act, and so one of the acronyms that I'll throw at you tonight is CEQA, and I promise not to do too many acronyms.

But CEQA requires that when agencies, in this case Los Angeles County, receives applications or contemplates or considers a discretionary action that they review the environmental consequences of those actions before they actually take an action to approve or not approve a project.

Now, the first thing the county did was reviewed -- do an initial review and what is called an initial study. And that initial review, which is included in your -- in this document, which is the

Notice of Preparation. So the initial study that I'll refer to is in here. What that determined is that the projects that I just described have the potential to result in significant impacts on the environment.

I use the word "potential" very purposefully, because at this point there is not an determination that there is, in fact, going to be a significant impact, only that the potential exists.

Because the potential for those significant impacts exist, the county has required that an Environmental Impact Report -- and here's the second acronym, EIR -- that an EIR be prepared for these projects.

Now, the purpose of that EIR is to do several things. First of all, to provide county -- it's -- it's a public disclosure document that will provide county decision-makers and the public with information regarding what are the physical changes that would occur, physical changes to the environment that would occur should these applications be approved.

That way the county, when they make the decision -- yes, they approve the project; no, they don't; yes, they put conditions on it -- they would have information. The public, when you show up to go to public hearings to comment on the project, you have

information regarding those physical affects.

The second is to identify and provide for implementation of feasible measures to reduce or eliminate -- and that's off, believe it or not.

But the second purpose is to -- is to look at implementation of needs to avoid or reduce those significant impacts on the environment that may be identified in the EIR.

The next purpose of that EIR is to explore what kinds of alternatives to the project as proposed might there be that could reduce or avoid significant impacts identified in that document.

So that is the purpose of the EIR that's being prepared.

Now, a public notice went out telling the public and public agencies an EIR is being prepared and asking for your input, the public's input, on what should be the contents of that EIR?

What kinds of analyses should be undertaken to determine what kinds of physical affects will result from this proposed project: the apartment units, removal of the -- of existing units, the construction of new units, hotel, park, and so on, and -- and the anchorage and marina.

That Notice of Preparation went out for public

review on March 22nd for a 30-day review. We're now at the end of that public review period. And because the meeting -- we're holding a meeting tonight on the 23rd of April, you will be given an opportunity to provide comments both verbally tonight and then also in writing.

And so on the back of your agenda is a place -- if you want to give written comments, you can do that. And then they would -- can be either provided -- given tonight. I can take them, or you can send them to the Department of Regional Planning.

Now, I will get to the purpose of tonight and -- and get to your part.

The studies that will be done and the analysis that will be included in this EIR are a series of environmental issues, and they are described in the document that you have, but what they are is the Environmental Impact Report. We'll look at -- at these projects in terms of their potential hazards: geologic hazards, soil hazards, flooding, tsunami inundation, and noise.

The EIR will look at what potential do these projects have for impacts to resources: hydrology, water quality, impacts on air quality, impacts on visual resources, and biological resources.

The EIR will look at the impacts these projects may have on services: traffic and access, water service, sewer services, impacts on schools, fire protection, and solid waste. And a series of other factors including environmental safety, population and housing, and then looking at -- at land use and consistency of the project with adopted plans for the area.

All of that is what will generally go into -- is what will go into the environmental document.

The next step that will occur is following tonight when we will talk about what you as the public think should be in that environmental document.

Following this meeting and getting any written comments that you have, the next step would be the preparation of what is called a draft Environmental Impact Report. And that will go out for public review, for a 45-day public review.

And that will give you an opportunity to provide comments on the analyses that were done. Are they adequate? Are they complete? Are they -- are they counter-intuitive? Do they make sense? And so on, and that will occur during a 45-day public review process.

Following that 45-day public review process --

there's lots of places for comment -- Los Angeles County will respond to all the comments that are received, and then there will be a final EIR.

Only after there is that final EIR that incorporates the draft EIR that you had for review, the county's responses to those comments, and people have had a 10-day time to look at -- at those comments or those responses. Only after that will public hearings for the project start.

And only after we go through this entire environmental review process comes the time that the public is invited to speak -- yes, we are in favor of the project; no, we are not in favor of the project.

And so the purpose of the scoping meeting tonight is to discuss the EIR being prepared for these projects. What issues do you believe should be addressed in that EIR? What analyses should be addressed in that EIR?

And so what we're going to do is take public comment on the content of the environmental document.

And what the scoping meeting is not -- and it really has under -- under California Environmental Quality Act, the meeting tonight has a very narrow focus. It is not a hearing for or against the project. The audience for your comments tonight are the people

writing the EIR and the county staff who are going to be reviewing the document.

This is not a hearing in the sense you're going to get at the end of the process for or against the project where your audience is the Regional Planning Commission or the Board of Supervisors.

So what we're going to talk about is what should be in the EIR.

Now, the other chances you will have for public comment -- and given how long it takes to write an EIR, review it, and get it out, I can give you a general time frame on kind of the -- the progress of the project.

The draft EIR, where you will look at what are the impacts of the projects? Do I agree? Do I not agree with -- with those as being what the impacts are with the analysis? That public review opportunity will occur in the fall of this year, 45-day review period.

The final EIR would be expected somewhere in the winter of 2007, 2008 with hearings starting at the planning commission about that time. Now, how long those public hearings take is really -- there's no -- no predicting, but they will probably be at the Board of Supervisors spring of 2008.

So with that, we'll start taking -- taking

public comment, but first a few ground rules. We have a court reporter in here. The purpose of having a court reporter is to make sure that any comments you give are taken down literally and that we don't have -- either I or somebody else trying to interpret what you said and so that the record for the EIR is exactly what is being said.

Now, the court reporter has also been instructed cheering and booing doesn't go in there. We don't have "crowd cheers," "crowd booed." Just what the person said who's actually supposed to be speaking, not the person in whatever row said this from the back. So that's one.

What we'll do is we'll give each person three minutes. We'll go through, and what I found is we're talking about what are the contents of the EIR, three minutes ought to do it.

You also have the opportunity for written comment, either on this form or to send to the Department of Regional Planning following -- either turn them in at this meeting, following the meeting, however you would like -- like to do it.

We have speaker cards. So anybody who wants to speak, hopefully you filled out one of these. If not, you can do that and give it to Roxy back there and

we'll collect them.

The reason for the speaker cards is, again, we want to make sure that the record of the meeting is -- is clear as to who had what to say, and we go from there.

So what I will do is, we set three minutes, and I actually happen to have a timer. This was -- this is pretty interesting seeing that you can actually get a timer on the Internet. There is nothing you can't find on the Internet anymore.

So, yeah?

DAVID DE LANGE: Procedural question. Can you accept donations of time from one listed speaker to another who wants to donate time?

LLOYD ZOLA: You know, the problem with that is it kind of gets -- gets the record goofy. So what we'll do is, if you can't finish in -- there you are. If you can't finish in -- in the three minutes, we can go through everybody and then go back to give you additional time.

Yeah?

AUDIENCE MEMBER: How do you ask questions?

LLOYD ZOLA: We can do it either -- either during -- during the time --

AUDIENCE MEMBER: Can I do it now?

LLOYD ZOLA: Yeah. If there's any questions --

AUDIENCE MEMBER: The question I have is who is conducting the EIR?

LLOYD ZOLA: Okay.

AUDIENCE MEMBER: By that I mean I'm looking for bias here.

LLOYD ZOLA: Okay. The EIR, the basic rules on it in -- in Los Angeles County, is the applicants retain an EIR consultant, and the county is obligated under the law to conduct an independent review of that document. And so this isn't like -- in the old days, an applicant would have their EIR -- consultants write an EIR, and it would go out. That's one reason why the timing does take long.

The county is required and the law requires that the county, in using that -- that document, exercise its independent judgment, and the document that goes out represents the independent judgment of the county.

So the law permits the applicant to submit any information, including information in the form of an EIR. Then obligates the agency, in this case, the county, to exercise its judgment on that document, and the document that goes out is legally the county's and must represent their independent judgment.

AUDIENCE MEMBER: I see. Thank you very much.

LLOYD ZOLA: Okay. With that -- um, now, that's really interesting.

AUDIENCE MEMBER: You're blocking it.

There you go.

LLOYD ZOLA: I did not go to school for electronics.

Okay. We have one more, and then if there's any more, we'll just -- we'll just collect them. What we'll do is, rather than have you come up, you can do this right -- right where you -- where you are, and I'll -- I'll run this. And then as I said, we can get to the end and, you know, we'll just go through this if there's any other additional comments.

First is -- and these are in the order we got them, by the way -- Judith Schaper.

Or the order they were handed to me, so.

You can go from right there.

JUDITH SCHAPER: Oh, okay. I'd rather go up here. Is that all right? I didn't know I was first.

LLOYD ZOLA: Sorry. Okay. You're on.

JUDITH SCHAPER: All right. My name is Judy Schaper, and I'm speaking to you tonight not as a resident of Marina del Rey, but as a volunteer official for United States Rowing. As a volunteer, I help

officiate official -- or officiate U.S. Rowing sanctioned regattas.

This past weekend, UCLA women's rowing team was to host the Miller Cup, a regatta attended by six universities from Southern California. The rain on Friday, April 20th, produced unhealthy levels of bacteria in the marina, and the regatta had to be canceled.

The UCLA women's rowing team is ranked 8th in the nation. USC, another participant in the Miller Cup, is ranked number 1 in the nation. The Miller Cup is the final large regatta before the Pac-10 championships on May 12th. All regattas are essential to these universities to accrue points towards invitation to the NCAA championships.

The pollution left a total of 192 athletes without a race, without a chance to further their goal of attending the NCAAs. Four of the teams in the Miller Cup were to arrive in the marina on Friday morning. Along with the athletes were coaches, trainers, family members, and fans. They were all going to stay at hotels, eat at restaurants, and shop in the marina.

The marina is not just apartments. It's not just used by occasional boaters. The marina is host to

some of the nation's best athletes who train here five to six days a week. However, a slight rain made the water so dangerous, it is unhealthy to be near.

How much longer will athletes, sailors, fishermen, and kayakers be willing to risk their lives to use the marina?

A huge source of pollution comes construction around the marina. The Shores project, located in the triangle between Via Dolce and Via Marina, have been deemed to be in an area of known water quality problems by the staff of the regional planning boards. I have the page here where they say yes, it's in an area of bad water quality.

The same staff, however, deemed the Neptune Woodfin project as not being in an area of known water quality problems. The Neptune Woodfin project is abutting the marina, across the street from the Shores project.

The marina is in very precarious health. How can it survive when some staff members of the regional planning board do not understand an area of known water quality problems?

Thank you.

LLOYD ZOLA: Thank you.

Next is Dan Gottleib.

DAN GOTTLEIB: My name is Dan Gottleib, and I live in the Marina Strand Colony 1. And I was concerned with the -- do I need to talk into here?

AUDIENCE MEMBER: Yes.

DAN GOTTLEIB: I was concerned with the description of the land use around the project. For example, the Woodfin is going to be a 19-story building, and across the way is condominiums, privately owned condominiums, that only rise three -- three stories.

Now, in the land use description, there wasn't a fact that having a large skyscraper would impact the smaller areas. So I would like the -- I would like information to go out to these people that live across the street who are going to be in the shadows.

Another point I want to make is scenic views. In the Shores EIR, the -- whoever wrote the -- staff or whoever wrote had trouble defining what a scenic view was, and all they ended up doing was taking pictures from across the street of the proposed buildings.

Staff had to put a -- a little mark in their independent review as to whether or not this thing would impact a hiking trail. And there is a hiking trail, Ballona Lagoon hiking trail, from which you should be able to see a 19-story building, which will eliminate the character of the sort of wild situation

there.

And also, there are certain views which are supposed to be protected according to the Coastal Commission. And one is from Chase Park, which is directly across from this 19-story building, and another one is from the -- the jetties on the channel.

You can look north and that -- and I'd like to see some pictures taken from those positions, especially lighthouse bridge, where you have a beautiful view in all four directions.

And I'd like this -- to have the tower described in those pictures so that whoever makes the decision can decide on whether or not the area is being changed from that.

LLOYD ZOLA: Okay. Thanks.

It's interesting how this works, but if you go over time, it starts saying how much over time. Again, it's not a contest to see who can do that.

Okay. Next we have David De Lange.

DAVID DE LANGE: I'm David De Lange. I'm executive director of Coalition to Save the Marina and also with Save MDR Alliance.

I'm going to need two sets of time, but it is first that I want to talk about the wetlands that will be altered greatly. It's described in this development

as a recreational park amenity, as if it's like that sign that says "land of many uses" when you enter a forest, being very anthropomorphic in its description rather than looking at it as an inherent part of nature.

We're told that the wetlands that exist there are -- are going to -- have just developed, as if it were out of nowhere, into a low quality wetland. But the truth is they've been there for thousands and thousands of years. They were degraded.

I'd like to see this considered in this way by county filling and earlier by construction failure and even earlier by the development of the marina. This is a pre-existing condition that's going to be altered.

And interestingly, who's going to be in charge of all this? Well, who's going to be in charge of monitoring this are the very people who participated in degrading it five years ago.

Beaches and Harbor will monitor. Will this sustain itself and be sustained as a wetlands in proper shape? We have a picture here in our coalition news of a Beaches and Harbor truck dumping eucalyptus filings and fillings into those wetlands.

No. 1, it's illegal to fill wetlands, and No. 2, it's illegal to poison all the things which make

it a wetlands, and that's exactly what this photograph documented happening. We documented later that these were -- and that's the very group that's supposed to be in charge of monitoring this process.

We'd like to have that looked at, whether that's the right monitoring group.

Now, wetlands restoration is being claimed as an amenity that's being offered here. What is the truth? The truth is that the wetlands -- the pocket wetlands is going to be reduced in size. It's going to be sandwiched between a 19-story building and a road. There's going to be an inadequate buffer zone, and there's going to be construction process itself which greatly degrades a wetlands.

We'd like to have those issues considered as to whether or not that is a legal impact upon a wetlands.

Then, to go on -- do I have that much remaining?

LLOYD ZOLA: No. It's going -- it's going backwards. Keep going. I'll tell you when.

DAVID DE LANGE: Okay.

Then I'd like to talk about a second issue. A wetlands is going to be traded for -- this restored wetlands, supposedly, for what? A lost bunch of

parking spaces. Well, that's not a quid quo pro trade.

You can't throw a Frisbee in a wetlands, you know, that's been restored. And yet that's supposed to be a concession for the fact that they're going to destroy all this parking space that can be changed into park land. Just simply not an acceptable trade.

Then, third thing -- I'd like to have that considered.

A third thing I'd like to have looked at is the double dipping that's going on here. What do I mean by double dipping? I'll finish on this point.

The tradeoff that we're being offered here is, well, you're going to get a little bit of remaining view corridor to compensate for a high -- it's about 40% of land. But also that's being used, that view corridor, to compensate for the destruction of all the view space that is the parking.

So two things are being destroyed, and you get a building, as your answer is a compensation. Wow, the compensation is a great loss, all and all, to view corridors.

And I must say in conclusion that I'd like to have it look to see whether or not that is compliant with and consistent with the Coastal Act. It's alleged here it's consistent with the LCP. No one ever thought

to mention this in the LCP because no one ever thought that such an unusual double dipping would occur.

So first, we don't say it's illegal. It's obvious it's illegal. But the Coastal Act will declare it for sure illegal. Thanks.

LLOYD ZOLA: Thank you.

You were right. This is supposed to be counting down, but never trust a free program off the Internet. Okay. So it's going up.

Next, Carla Andrus.

CARLA ANDRUS: And I have somebody that's ceding the time to me if I need it. I probably won't.

LLOYD ZOLA: If we need it, we'll just go -- we'll just go back around.

CARLA ANDRUS: Thank you.

My name is Carla Andrus. I work with people that are just citizens of the marina. It's not an organization, but we just kind of tagged ourselves as "we are the marina," and I also work with an organization called Power that's very interested in affordable housing.

In April of 2006, the Design Control Board realized it had approved five projects, which include the Neptune Apartments, that FF parking lot, based on a misunderstanding of the county and the applicant's

claim that all required parking was included on project site.

It asked the county to have the applicant either scale back the project to meet on-site requirements or find other locations to accommodate projects of that size. Where are those revisions that the Design Control Board asked for?

The project status -- two, the project status report acknowledges that there are 103 missing parking spaces on-site for parcel FF.

Why is this project beginning the EIR phase of the regulatory process before the project has been redesignated to include those spaces or scaled back to accommodate all required parking on-site as required by the LCP?

No. 3, why are you proceeding to the EIR phase on the entitlement process on a project that has not even resolved a major land use regulatory matter? And that's timeshare.

Timeshare is a residential ownership plan. Just because the individual owner won't be a full-time resident in the marina doesn't mean they are paying guests and thereby entitling their privately owned unit to be hotel status.

This is a regulatory matter that suggests you

are selling public assets. Doesn't this violate the LCP and public trust?

A net increase -- five, a net increase of transient slips creates a net loss of slips to the current boating tenants. How do you come to terms with that? This will undoubtedly require an LCP amendment that has been omitted from the project status report.

Six, the Board of Supervisors just approved several million for a sea wall restoration. How will the pile driving affect the foundation of the sea wall? What measures are taken by the applicants, first, to protect from additional damage and, second, to restore or repair any damage that will occur?

Seven, the next EIR should be for our master plan.

Eight, why haven't alternative plans been considered? The public has wonderful ideas that do not require LCP amendments and follow our mandate for public use.

Thank you.

LLOYD ZOLA: Thanks.

Trying to actually get all these as you do this.

Next is Richard Miller.

RICHARD T. MILLER: Thank you. I understand I'm

not the only Richard Miller in the marina, so I'll be Richard T. Miller.

I am speaking tonight on behalf of Marina Strand Colony 1 Condominium Association. It's a collection of 145 condominium units across the street from this development. I'm also here on behalf of Coalition to Save the Marina, Inc.

I'm going to keep this brief so I can defer some of my time to other speakers who have more to say tonight. But I just want to make sure the record includes our input that the EIR scope should include a new regional traffic study, including in Marina del Rey and the surrounding areas, to study existing increased traffic for, in, and around Marina del Rey, for all the development that's already occurred in the last ten years or so, as well as greatly increased potential traffic from the proposed 10 or more projects in the pipeline here in the marina.

This is not the only project that's underway. There's about 10 to 15 other projects that are in the stream. So a new regional traffic study should be included in this EIR.

Additionally, the Environmental Impact Report should include analysis of view corridors, mitigation of view corridor deterioration, and the collateral

effect on recreational boating activities.

Thank you.

LLOYD ZOLA: That was all the slips I had. Was anybody else in -- yes?

Did you already fill one out?

ROSLYN WALKER: Yes.

I will use very little time and hopefully be able to cede my time to someone else that may want it. I don't have anything written, and I am not an expert like some of the speakers you heard, and I don't know anything about EIRs.

But I wonder if the people who do know about EIRs feel that in doing one, no matter who they're hired by, they can do it successfully when they do it project by project and not the whole.

So building on what all the other speakers have said here, there are projects in the pipeline, there are projects proposed, there are projects that have happened, there are projects immediately outside the marina cityside.

And how can an EIR that encompasses the environment and traffic inclusion and water and wind and everything, done project by project, be worth anything? And that's my question.

Thank you.

LLOYD ZOLA: Thank you. Anybody else?

Did you get all your comments in?

DAVID DE LANGE: I'm waiting for the second round.

LLOYD ZOLA: That's what I was asking --

DAVID DE LANGE: Oh, yes.

LLOYD ZOLA: -- if you're ready.

DAVID DE LANGE: I guess so.

LLOYD ZOLA: You almost missed your cue on that one.

DAVID DE LANGE: Thank you for the second opportunity. I am, again, David De Lange, the executive director of Coalition to Save the Marina and also with Save MDR Alliance.

Probably a sense is growing, those of you listening, that even though this is a scoping session, the citizens who have managed to come here tonight are speaking with a very similar voice, and the voice seems to be saying that we're very concerned about this project, one way or the other, and indeed we are.

There is language throughout the LCP, and in the Coastal Act, which makes -- I wish more specific -- but adequate reference to public interest and public needs. And I would really wish that the human factors and human impacts on those who currently intensively reside in, visit, and pass through regularly, let's

add, the marina will be considered.

The impacts on such people of a development of this kind, which is of a piece with many other like it in the pipeline, is going to have a devastating impact on our style of life, on our way of life. And I don't mean those who just live here. I mean those who visit and regularly pass through here.

I would like to go to a specific issue that I would like to see scoped more adequately, I think, than the initial scoping in this Notice of Preparation did provide. It has to do with the timeshare that's being hybridized with the hotel.

Now, when you look at the law on this, it's curious that there is no provision that I've been able to find anywhere in the LCP or Coastal Act governing the timeshares. There are, of course, provisions governing hotel structures.

And one of the things that has to happen here is that, you know, to build a 225-foot tall building, which is the max for the marina, it must be designated a hotel. But there's a little problem. It's also partially a timeshare. And there's no LCP language that allows -- nor does it -- accurately was stated in the Notice of Prep prohibit such a thing from occurring.

The problem is, in the absence of an entitlement to go ahead, you're going to probably need -- I'd like to have you consider this -- an amendment, language that -- that governs this situation.

You're going to have to go to the Coastal Commission. And I know already what they think. I know what Pam Emerson at the Coastal Commission already thinks about this issue. She thinks that this timeshare idea being put together with a hotel is unacceptable. She's the chief staff analyst there, and she's commented on this to me. I deal with her constantly on all kinds of entitlement issues.

So I'd like to have that looked at. Whether, in fact, despite all the excellent and very careful analysis I saw in the Notice of Prep, whether, in fact, it is really the truth that this is a legally acceptable -- not just an arguably acceptable thing that's going to occur.

I see the arguments for it. There are many against it that I could have offered. I'd like to see it studied from a legal point of view.

There's a second thing I would like to talk about, having to do with a process that I spotted being commented on, but I haven't studied this adequately to

know what I was really reading. It comes from page 22 of the Notice of Preparation --

LLOYD ZOLA: Before you do, I'm sorry. You're at the three minute --

DAVID DE LANGE: Okay.

LLOYD ZOLA: I was going to ask anybody to give time. I just want to make sure there's nobody else that wants to speak.

AUDIENCE MEMBER: He can have my time.

LLOYD ZOLA: Okay. Nobody else wanting to speak? Then we're going to go to --

CARLA ANDRUS: I just have one simple question that will take less than a minute after he's done.

LLOYD ZOLA: Okay. So we'll go -- we'll go third -- third and final round.

DAVID DE LANGE: Okay.

I would like to bring to the attention of the reviewing body discussion on page 22 of the Notice of Preparation. And there there's a discussion of -- suggesting that it's okay to defer the parking replacement that's supposed to occur by law for the parking elimination until a much later date.

I suspect that what I'm going to find is that there is some language that insists, as in many cases, that you first develop the replacement piece before you

destroy what you're going to destroy, which is the existing parking.

I don't know if that's the case, but I'd like to have that looked into. And if indeed that is the case, then this is a violation of the LCP to go ahead. You're going to need an amendment on that point too.

I have noticed that the Coastal Commission doesn't like to give amendments on that. They like stuff to be in place before you destroy something that is, you know, being replaced. And in this instance, it's parking.

Now, there may be reasons to get rid of parking here, because it's not much utilized but in that it's not going to park land and that we do need parking in other spots, that replacement provision would be important.

Thanks for your time.

LLOYD ZOLA: Great. Thank you.

And one more?

CARLA ANDRUS: Yes, thanks.

LLOYD ZOLA: I need you to identify yourself again.

CARLA ANDRUS: Carla Andrus.

I just -- I just know that there's -- the boating community is going to be terribly impacted by this. The slip rentals are going to go up,

100-some-odd people or boating slips will be displaced, and that puts a hardship on the people that are there. And that's a major concern of mine.

And another major concern is that this hotel timeshare is very expensive. It's like five star, four star, whatever star, but it's not -- it doesn't have accommodations for the general public that, you know, would like to also enjoy any hotels. But that -- but it's not accessible to them because, you know, the prices are going to be very high.

And that's the only other concerns that I have.

LLOYD ZOLA: Great. Thank you.

Now comes the test. Can I actually summarize all of that.

What I'll do is -- is do a quick summary of the -- of the comments we've heard. And actually, you all did really good in terms of focusing in on the environmental effects. And there's some questions that came up, and I'll try and summarize all -- all the comments.

One question was: Can an EIR on -- on just one project really address impacts when there's a series of different projects and things going on over time?

One of the requirements of the California Environmental Quality Act, as with all EIRs, is that you address not only the impacts of the project itself, but all reasonably foreseeable future projects.

And so there will be in the environmental document what's called a cumulative -- cumulative impact section that will look at not only the projects being proposed now, but also other projects that are being filed or can reasonably be foreseen.

There was a comment on -- on looking at and I'll -- looking at the impacts of deferring parking and whether that is consistent with the coastal program and whether that needs an amendment to the coastal program.

In relation to traffic, there was a comment that a new regional traffic study be prepared that incorporates, again, those cumulative projects, and that is part of the requirements under -- under CEQA that -- the traffic and other issues address cumulative impacts.

Incorporation of design revisions and why are we doing -- why is -- "we"? I'm done after tonight.

Why is an EIR being prepared when there are still issues over existing approvals? And the simple reason for that is applications have been submitted to the county. The county, under the law, is required to

do something with those new applications and the review that was done of those applications determine that there is the potential for significant impacts, so therefore, the EIR process.

That is separate from the questions that you've asked related to the corporation, the Design Review Board conditions. So that's a question that needs to be asked of the county, and what happened or what is going on with that.

There was a comment regarding adequacy of parking, and that should be addressed in the EIR. Is there adequate parking, the deferral of parking?

Couple different speakers talked about the timeshare and is that really permitted under the coastal program? And so part of the analysis that will be done will be consistency with the coastal program.

Let's see. The issue of consistency provisions, the Coastal Act that's part of the review that will occur under the land use section. Same in relation to the timeshare and consistency with coastal program and the Coastal Act and the county's general plan there.

One speaker asked that the EIR address the water quality issue's affect on bacteria levels in the marina and construction impacts in particular in

relation to that.

Impacts -- that the EIR should address impacts on the number of boating slips, impacts on boating community.

We should take a look or the county should take a look at the description of land use in and around the coast projects and then address the differences in building heights between existing uses and proposed uses and how that affects views.

And also look at affects on scenic view corridors. But when looking at the view corridors to look at views of the proposed projects from various locations and what would be affected from where.

The EIR should address the impacts on wetlands and also look at why the wetlands are degraded, and that a concern with mitigation monitoring -- there will be as part of the Environmental Impact Report a mitigation monitoring program.

And there was a concern raised as to making sure that that would be adequate and that the right people are actually looking at our mitigation measures being implemented correctly.

The comment was that we should not be filling in wetlands or impacting plants in wetlands and the impacts of that would then be addressed in the EIR.

Couple questions that came up on whether mitigation for wetland impacts is really adequate in the way that it's being proposed. So that would be addressed in the EIR.

Then also its mitigation for the view corridor impacts adequate. And so that would be a review. So not just addressing the impacts, then proposing mitigation, but then looking at is that mitigation, in fact, adequate to do what it's planned to do in terms of reducing the impacts of this project.

And then consistency of mitigation measures with the local coastal program, that particularly in relation to wetlands impacts, and some of the impacts and the way the mitigation measures are being done as to whether they -- the questions was is it double counting or not? And is that, in fact, the mitigation for the series of impacts?

So that summary, along with the court reporter's actually recording everything specifically that was said, will now become part of the record for the Environmental Impact Report.

What you'll see is as -- in the fall of this year, when the draft EIR is sent out for public review, that will be fall of 2007, go out for 45-day public review, be as part of the appendices the minutes or the

notes from this meeting, and the court reporter's transcription of those notes will be part of that record.

So that will be the next opportunity that you have for public comment. Following then with that public review, EIR responses, and then a final EIR, somewhere in the winter of this year, in the next year, will be the public hearings.

And that will be the opportunity that the public has to speak for or against the project, and then the Board of Supervisors after that.

So with that, I would like to thank everybody for coming and -- you have a question?

DAVID DE LANGE: Is that okay?

LLOYD ZOLA: Yeah.

DAVID DE LANGE: I have been seeking clarification on what's to me unusual that two major development projects -- the apartment complex and a hotel timeshare, those are the two -- are being looked at in one EIR consideration. Typically even though you look at the cumulative impacts, you do it one project at a time.

So in this instance, we have five parcels, five CDPs, coastal developments, and -- and really three parcels and two major projects, all in one EIR.

Is that -- that's unusual. What's the law on that?

LLOYD ZOLA: Actually, the -- the law on requirements would say, when you have a series of -- of related applications, as you -- it's easy to see that these are, series of development applications on parcels immediately adjacent to each other that -- what CEQA says is that should be one EIR and look at those projects as geographically related in one analysis, that the county would have been at fault had they said, "You know what? We got three applicants. We got three applications. We're in three separate EIRs. We'll address the impacts of those projects together only in one little section."

And so here -- I think somebody made the comment about analyzing the projects as a whole, and that's one of the reasons why you're seeing one EIR for the series of actions, and then you'll have cumulative impacts on top of that with applications that are -- either have been filed before this and what might be filed or reasonably be expected to be filed.

And so now we're getting into questions, and that's not the purpose of a scoping meeting.

So what we can do is I'll take -- let's see. Who else has questions? I'll take one there and one there, and then I'll stick around afterwards for

whatever other questions you have after.

Yeah?

AUDIENCE MEMBER: The reason for this question is because I want to add an addendum to the scope that it should include consideration of the affect -- affect on adjacent existing homeowners during the construction process.

And my question is, if you know, how -- from start to finish, how long is this construction process going to be?

LLOYD ZOLA: That I don't know, but that should be, based on -- on your comment, part of the EIR and part of the analysis of construction impacts should identify how long the construction goes on for, what types of construction are occurring. Because you have got some grading activities, you've got construction activities, and then what times of day would that occur. So that would be all part of the analysis.

And you had a question?

AUDIENCE MEMBER: Didn't you say I could ask a question?

LLOYD ZOLA: Oh, I'm sorry. I forgot yours.

AUDIENCE MEMBER: That's okay.

DAN GOTTLEIB: The EIR for the Shores project, final EIR, contained terrible inaccuracies with respect

to the shadows. And I would like this EIR to avoid those.

One of the mistakes that was made in the final EIR was misquoting the city's standard for --

COURT REPORTER: I'm sorry. I didn't hear the end of his question.

LLOYD ZOLA: You need to give the end.

DAN GOTTLEIB: I'm pointing out something that made it through all the processes, had the independent review, and came out to be wrong. Because some EIRs are done very well, and you can actually -- you know, citing of where the law was and where that -- that by-line was, somewhere. And the end -- it was heeded, I guess by the developers (inaudible).

But then in the finding -- in the finding, the staff actually neglected half of that statement, and so that's a false statement. And I'm worried that -- I know this -- that -- that EIR seems to borrow from other EIRs.

LLOYD ZOLA: Okay. Here's the process. One of the reasons that you go through the independent reviews is to make sure everything is right and in the best of both worlds --

DAN GOTTLEIB: As a matter of fact, the independent review (inaudile).

LLOYD ZOLA: Right. The reason that an EIR does not go directly from being written into public hearing is to go through a public review and give the public a chance. So if you see things, being residents of the area, that don't jive with your experience, one of the purposes of that 45-day review is for you to provide written comments, "This doesn't jive with what actually occurred."

So that's -- that's the review that will occur in -- in the fall of this year.

And you had a question? And then we'll --

CARLA ANDRUS: Yeah.

In 2006, April, Supervisor Knabe asked for a review of Mother's Beach. And that's when all five parking lots of -- came into question. And parcel FF as a parking lot is one of those parking lots that were -- were -- that there was a big concern that they did not have their on-site parking.

So when you're looking at an EIR and you're looking at something in a comprehensive way, we were looking at Mother's Beach strategic plans. So that parking lot is also -- should be bringing in the other parking lots in consideration. Because this is near Mother's Beach and it is on the west side of the marina.

LLOYD ZOLA: Yeah. So when we -- so -- as a means of wrapping up, when the analysis of adequacy of parking is done, it should look not only just at this one site, but what is -- what is the effect of -- generally on parking.

CARLA ANDRUS: Exactly.

LLOYD ZOLA: Great. With that, I'll go through the -- the next series again of when will be additional time for comments. In the fall of this year will be the 45-day review period for the draft EIR.

So if you want to get -- anybody who signed in will get a notice of the availability of that EIR. So we'll make sure that -- that you're on the list to get a notice that the EIR is available. That will occur in fall, 45 days, with actual public hearings on the projects themselves, starting winter, at the end of this year, beginning of next year, and then sometime therefore, at the Board of Supervisors.

So with that, I'd like to thank everybody for -- for coming, and that's the -- the next step is review of the draft EIR itself.

Thank you.

(Whereupon, at 7:00 p.m., the proceedings were concluded.)

CERTIFICATE

OF

SHORTHAND REPORTER

* * * * *

I, the undersigned shorthand reporter, in and for the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place therein set forth.

That the foregoing proceedings were recorded stenographically by me and were thereafter transcribed under my direction.

That the foregoing is a true record of the testimony and of all objections made at the time of the proceedings.

In witness whereof, I have subscribed my name on this date: .

ANASTASIA SWINKLES, SHORTHAND REPORTER

Comment Letters

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

March 26, 2007

REPLY TO
ATTENTION OF:
Office of the Chief
Regulatory Division

Mr. James Hartl
Los Angeles County Department of Regional Planning
320 West Temple Street
Los Angeles, California 90012

Attn: Mr. Rick Kuo
Re: R2006-03644, Neptune Marina Apartments & Anchorage Hotel

Dear Mr. Hartl:

Thank you for the opportunity to comment on the project referenced above. Based on our preliminary review of the information submitted, we have determined that the proposed project may require a U.S. Army Corps of Engineers Section 404 permit.

A Corps of Engineers permit is required for the discharge of dredged or fill material into, including any redeposit of dredged material within, "waters of the United States" and adjacent wetlands pursuant to Section 404 of the Clean Water Act of 1972. Specifically, the proposed restoration and enhancement of the existing 0.47-acre jurisdictional wetland located within Parcel 9U may result in the discharge of fill within our geographical jurisdiction.

If you have any questions, please contact me at (213) 452-3290. Please refer to this letter and SPL- 2007-313-KW in your reply.

Sincerely,

Kenneth Wong
Project Manager, North Coast Branch
Regulatory Division

DEPARTMENT OF TRANSPORTATION
DISTRICT 7, REGIONAL PLANNING
IGR/CEQA BRANCH
100 SO. MAIN ST.
LOS ANGELES, CA 90012
PHONE (213) 897-6536
FAX (213) 897-1337
E-Mail:NersesYerjanian@dot.ca.gov

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Flex your power!
Be energy efficient!

Mr. Rick Kuo
Department of Regional Planning
County of Los Angeles
320 West Temple St. Room 1348
Los Angeles, CA. 90012

IGR/CEQA# 070339/NY
NOP/ Neptune Marina Apartments & Anchorage
Woodfin Suite Hotel & Timeshare Resort Project
526-Unit Apartments & 288- Hotel & Timeshare Suits
LA/90,001/0.92, 31.28

March 27, 2007
Dear Mr. Kuo:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Neptune Marina Apartments & Anchorage, Woodfin Suite Hotel & Timeshare Resort Project (526-Unit Apartments & 288- Hotel & Timeshare Suits development in the LA County.

Based on the information received, and to assist us in our efforts to completely evaluate and assess the impacts of this project on the State transportation system, a traffic study in advance of the DEIR should be prepared to analyze the following information:

Please reference the Department's **Traffic Impact Study Guideline** on the Internet at http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf

1. Presentations of assumptions and methods used to develop trip generation, trip distribution, choice of travel mode, and assignments of trips to State Route 90 & 001.

2. Consistency of project travel modeling with other regional and local modeling forecasts and with travel data. The IGR/CEQA office may use indices to check results. Differences or inconsistencies must be thoroughly explained.

3. Analysis of ADT, AM, and PM peak-hour volumes for both existing and future conditions in the affected area. This should include freeways, interchanges, and intersections, and all HOV facilities. Interchange Level of Service should be

specified (HCM2000 method requested). Utilization of transit lines and vehicles, and of all facilities, should be realistically estimated. Future conditions would include build-out of all projects (see next item) and any plan-horizon years.

4. Inclusion of all appropriate traffic volumes. Analysis should include traffic from the project, cumulative traffic generated from all specific approved developments in the area, and traffic growth other than from the project and developments. That is, include: existing + project + other projects + other growth.

5. Discussion of mitigation measures appropriate to alleviate anticipated traffic impacts. These mitigation discussions should include, but not be limited to, the following:
   - description of transportation infrastructure improvements
   - financial costs, funding sources and financing
   - sequence and scheduling considerations
   - implementation responsibilities, controls and monitoring

   Any mitigation involving transit, HOV, or TDM must be rigorously justified and its effects conservatively estimated. Improvements involving dedication of land or physical construction may be favorably considered.

6. Specification of developer's percent share of the cost, as well as a plan of realistic mitigation measures under the control of the developer. The following ratio should be estimated: Additional traffic volume due to project implementation is divided by the total increase in the traffic volume (see Appendix "B" of the Guidelines). That ratio would be the project equitable share responsibility.

   We note for purposes of determining project share of costs, the number of trips from the project on each traveling segment or element is estimated in the context of forecasted traffic volumes which include build-out of all approved and not yet approved projects, and other sources of growth. Analytical methods such as select-zone travel forecast modeling might be used.

   The Department as a commenting agency under CEQA has jurisdiction superceding that of MTA in identifying the freeway analysis needed for this project. Caltrans is responsible for obtaining measures that will off-set project vehicle trip generation that worsens Caltrans facilities and hence, it does not adhere to the CMP guide of 150 or more vehicle trips added before freeway analysis is needed. MTA's Congestion Management Program in acknowledging the Department's role, stipulates that Caltrans must be consulted to identify specific locations to be analyzed on the State Highway System. Therefore State Route(s) mentioned in item #1 and it's facilities must be analyzed per the Department's **Traffic Impact Study Guidelines.**

We look forward to reviewing the DEIR. We expect to receive a copy from the State Clearinghouse. However, to expedite the review process, you may send two copies in advance to the undersigned at the following address:

Cheryl J. Powell
IGR/CEQA Branch Chief
Caltrans District 07
Regional Transportation Planning Office
100 S. Main St., Los Angeles, CA 90012

If you have any questions regarding this response, please call the Project Engineer/Coordinator Mr. Yerjanian at (213) 897-6536 and refer to IGR/CEQA # 070339/NY.

Sincerely,

Cheryl J. Powell
IGR/CEQA Branch Chief
Regional Transportation Planning

STATE OF CALIFORNIA - THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, *Governor*

CALIFORNIA COASTAL COMMISSION
South Coast Area Office
200 Oceangate, Suite 1000
Long Beach, CA 90802-4302
(562) 590-5071

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April, 27 2007

Rick Kuo
Los Angeles County Department of Regional Planning
320 W. Temple Street, room 1348
Los Angeles, CA 90012

Re: The Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project (Parcels 9U, 10, and FF) SCH# 2007031114

Dear Mr. Kuo:

On March 27, 2007, our South Coast District office received the Notice of Preparation for the Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project. The proposed project is located in the western portion of the Marina del Rey harbor within parcels 10R, FF and 9U. In the certified Local Coastal Plan Parcel 9U is designated for a hotel, Parcel 10 is designated for multi-family apartments at high and medium densities, and parcel FF is designated for public open space. The project consists of apartment complexes on Parcel 10R and parcel FF; hotel and timeshare resort on the northern portion of Parcel 9U; restored public wetland and upland park area on the southern portion of Parcel 9U; and public transient boat anchorage adjacent to Parcel 9U.

The EIR provides the basis for the environmental assessment of the project's consistency with the California Environmental Quality Act but also the factual basis for the evaluation of the project's consistency with the policies of the certified LCP, many of which require assessment of the impacts of the project. As such, it should include enough information to evaluate the project's consistency with the certified LCP Since it appears that portions of the proposed development is not consistent with the certified LCP land use designations for the subject properties an LCP amendment will be necessary, the EIR should provide information to assess the project's consistency with the applicable Coastal Act policies (wetland, terrestrial and marine habitat, water quality, scenic resources, open space and public access) which will provide the basis for future staff recommendations on any LCP amendment and permit application which may be filed with the Commission. If any parts of the project are located in an area of retained jurisdiction, in those areas, the project itself must be found consistent with the Coastal Act.

- The proposal includes restoration of a degraded wetland on the site (parcel 9U) with a wetland buffer of no less than 25 feet. A detailed biological study should be provided to demonstrate the degraded nature of the wetlands located on 9U and show details indicated in preliminary discussions regarding restoration. While a minimum buffer of no less than 25 feet may be appropriate, the biological analysis should justify why a minimum 25 foot buffer is appropriate in this case. The biological analysis should address the degraded nature of the existing wetland and adequacy of the proposed buffer to protect the wetland habitat values and function of the restored wetland and associated upland area.

- Adequate view corridors should be provided consistent with the LCP and protected from view blockage due to development, including landscaping and fencing. The analysis should show impacts on public and private views, as well as consistency with LCP standards.

- To be considered public transient docks, the proposed transient docks should function as public (short-term or long-term) docks available to the public, as opposed to privately-operated chartered and excursion service docks.

- The redevelopment of Neptune Marina anchorage should protect and encourage low-cost boating activities through the provision of a proportional number of smaller boat slips and/or low-cost boating programs.

- Parcel 9U is designated for hotel use in the LCP. The proposed timeshare use on this parcel is not listed as a permitted use in the LCP. Timeshare use should be clearly defined and listed as a permitted use, and the use would require an amendment to the LCP. To be consistent with the Coastal Act, the policies and the design of the development approved under the policies should encourage short-term visitor use. A hotel owned as a timeshare should remain a hotel and should not resemble or be operated as an apartment building. To be consistent with the Coastal Act, any amendment to the LCP to allow such a use should incorporate policies and development standards, such as, a limitation on the percentage of units allowed within the development and throughout the marina to be privately owned, limitations on operation, including time restrictions on owner occupancy, in order to regulate the use to protect and encourage visitor serving use, consistent with Sections 31211, 31213, and 30221 of the Coastal Act.

- With any future LCP amendment and/or coastal development permit for the proposed development we will consider the provision of open space and its consistency with the open space standards of the LCP. The proposed analy

- Finally, review of an LCP amendment is complex. This letter can anticipate the most apparent issues but we may discover other issues as we proceed with our analysis of the LCP amendment and hear from County staff, leaseholders, and the public.

Thank you for the opportunity to review and comment on the Notice of Preparation. The Coastal Commission will review the project more thoroughly during the LCP amendment process.

Sincerely,

Al J. Padilla
Coastal Program Analyst

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Cynthia Bryant
Director

Notice of Preparation

March 22, 2007

To: Reviewing Agencies

Re: The Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project
SCH# 2007031114

Attached for your review and comment is the Notice of Preparation (NOP) for the The Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Rick Kuo
Los Angeles County Department of Regional Planning
320 W. Temple Street, Room 1348
Los Angeles, CA 90012

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Senior Planner, State Clearinghouse

Attachments
cc: Lead Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2007031114
Project Title The Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project
Lead Agency Los Angeles County Department of Regional Planning

---

Type NOP Notice of Preparation

Description Proposed project is the Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel Timeshare Resort Project on Parcels 10R, FF, and 9U as well as adjacent Marina Basins. The proposed project consists of five components requiring Coastal Development Permits, Plan Amendments, Conditional Use Permits, a Tract Map, and a Variance. Components 1 (Parcel 10R) and 2 (Parcel FF) consist of demolishing all existing apartment structures to build a total of 526 apartment units and two waterfront public pedestrian promenades. Component 3 is for the development of the northerly portion of Parcel 9U to construct a 19-story building with 288 hotel and timeshare suite units and accessory uses. The proposed building will include a six-level parking garage, with one level below grade, for a total of 360 parking spaces. Component 4 consists of a 1.46-acre public wetland and upland park on the southern portion of Parcel 9U. Component 5 is to construct a public transient boat anchorage that would be situated proximal to parcel 9U within the Marina Del Rey Basin B. This public anchorage would contain approximately 2,923 s.f. of dock area and would provide approximately 542 linear feet of transient boat docking space. Approximately 215,000 c.y. of grading will be required with excess cut material to be exported to the La Puente Landfill.

Lead Agency Contact

Name Rick Kuo
Agency Los Angeles County Department of Regional Planning
Phone (213) 974-6461 **Fax**
email
Address 320 W. Temple Street, Room 1348
City Los Angeles **State** CA **Zip** 90012

Project Location

County Los Angeles
City
Region
Cross Streets Via Marina and Marquesas Way
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways 1 and 90
Airports Los Angeles International
Railways
Waterways
Schools Venice HS and Westchester HS
Land Use Residential III and IV with Waterfront Overlay (Parcel 10R); Open Space (Parcel FF); Hotel, Water, Waterfront Overlay (Parcel 9U)

Project Issues Aesthetic/Visual; Air Quality; Archaeologic-Historic; Flood Plain/Flooding; Geologic/Seismic; Noise; Recreation/Parks; Sewer Capacity; Solid Waste; Traffic/Circulation; Vegetation; Water Quality; Wetland/Riparian

Document Details Report
State Clearinghouse Data Base

Date Received 03/22/2007 ***Start of Review*** 03/22/2007 ***End of Review*** 04/20/2007

County: Los Angeles SCH#

- ☐ **Fish & Game Region 3**
  Robert Floerke
- ☐ **Fish & Game Region 4**
  Julie Vance
- ■ **Fish & Game Region 5**
  Don Chadwick
  Habitat Conservation Program
- ☐ **Fish & Game Region 6**
  Gabrina Gatchel
  Habitat Conservation Program
- ☐ **Fish & Game Region 6 I/M**
  Gabrina Getchel
  Inyo/Mono, Habitat Conservation Program
- ☐ **Dept. of Fish & Game M**
  George Isaac
  Marine Region

Other Departments

- ☐ **Food & Agriculture**
  Steve Shaffer
  Dept. of Food and Agriculture
- ☐ **Depart. of General Services**
  Public School Construction
- ☐ **Dept. of General Services**
  Robert Sleppy
  Environmental Services Section
- ☐ **Dept. of Health Services**
  Veronica Malloy
  Dept. of Health/Drinking Water

Independent Commissions,Boards

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  Debby Eddy
- ■ **Office of Emergency Services**
  Dennis Castrillo
- ☐ **Governor's Office of Planning & Research**
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- ■ **Native American Heritage Comm.**
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  Jean Sarino
- ☐ **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Business, Trans & Housing

- ■ **Caltrans - Division of Aeronautics**
  Sandy Hesnard
- ☐ **Caltrans - Planning**
  Terri Pencovic
- ■ **California Highway Patrol**
  Shirley Kelly
  Office of Special Projects
- ■ **Housing & Community Development**
  Lisa Nichols
  Housing Policy Division

Dept. of Transportation

- ☐ **Caltrans, District 1**
  Rex Jackman
- ☐ **Caltrans, District 2**
  Marcelino Gonzalez
- ☐ **Caltrans, District 3**
  Jeff Pulverman
- ☐ **Caltrans, District 4**
  Tim Sable
- ☐ **Caltrans, District 5**
  David Murray
- ☐ **Caltrans, District 6**
  Marc Birnbaum
- ■ **Caltrans, District 7**
  Cheryl J. Powell
- ☐ **Caltrans, District 8**
  Dan Kopulsky
- ☐ **Caltrans, District 9**
  Gayle Rosander
- ☐ **Caltrans, District 10**
  Tom Dumas
- ☐ **Caltrans, District 11**
  Mario Orso
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Cal EPA

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  Division of Financial Assistance
- ☐ **State Water Resources Control Board**
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  Division of Water Quality
- ☐ **State Water Resouces Control Board**
  Steven Herrera
  Division of Water Rights
- ■ **Dept. of Toxic Substances Control**
  CEQA Tracking Center
- ☐ **Department of Pesticide Regulation**

Regional Water Quality Control Board (RWQCB)

- ☐ **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- ☐ **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- ☐ **RWQCB 3**
  Central Coast Region (3)
- ■ **RWQCB 4**
  Teresa Rodgers
  Los Angeles Region (4)
- ☐ **RWQCB 5S**
  Central Valley Region (5)
  - ☐ **RWQCB 5F**
    Central Valley Region (5)
    Fresno Branch Office
  - ☐ **RWQCB 5R**
    Central Valley Region (5)
    Redding Branch Office
- ☐ **RWQCB 6**
  Lahontan Region (6)
  - ☐ **RWQCB 6V**
    Lahontan Region (6)
    Victorville Branch Office
- ☐ **RWQCB 7**
  Colorado River Basin Region (7)
- ☐ **RWQCB 8**
  Santa Ana Region (8)
- ☐ **RWQCB 9**
  San Diego Region (9)

☐ **Other** _____

Last Updated on 09/10/06

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APR 30 2007

Public Input Form
Scoping Meeting
The Neptune Marina Apartments and Anchorage/ Woodfin Suite Hotel and Timeshare Project
County Project #'s R2006-03647 (10R), R2006-03652 (FF), R2006-03644 (9U North), TR067861 & R2006-03643 (9U South)

April 23, 2007

Required Approvals:

- Coastal Development Permits
- Conditional Use Permits, Parking Permits, Variances
- Subdivision Map, Plan Amendments

This form allows you to make comments on what you believe should be addressed in the Environmental Impact Report. You may submit your comments at this scoping meeting or mail to the Lead Agency Contact listed below. Written comments on the Notice of Preparation (NOP) for the Environmental Impact Report will be accepted until **April 30, 2007 at 5:00 P.M.**

Comments: The waterfront space Gateway by the Woodfin Suite Hotel project, ~~facility~~ building cannot in any way, it seems obvious, be considered to allow the 40% public access mandated by the Marina Local Coastal Program/PLAN. Alternative proposal: eliminate the portion of the Waterfront Restaurant/Bar, Meeting Room + Conference Room buildings directly adjacent to the Hotel and East of the Indy Corridor (driveway) → see attached drawing

You may also indicate if you would like to receive notices for hearings on the project. If you wish to have a notice, please be sure to include your name and full address. The EIR will be available at local libraries and the County offices and, for a charge, individual copies may be obtained through a bonded blue printer.

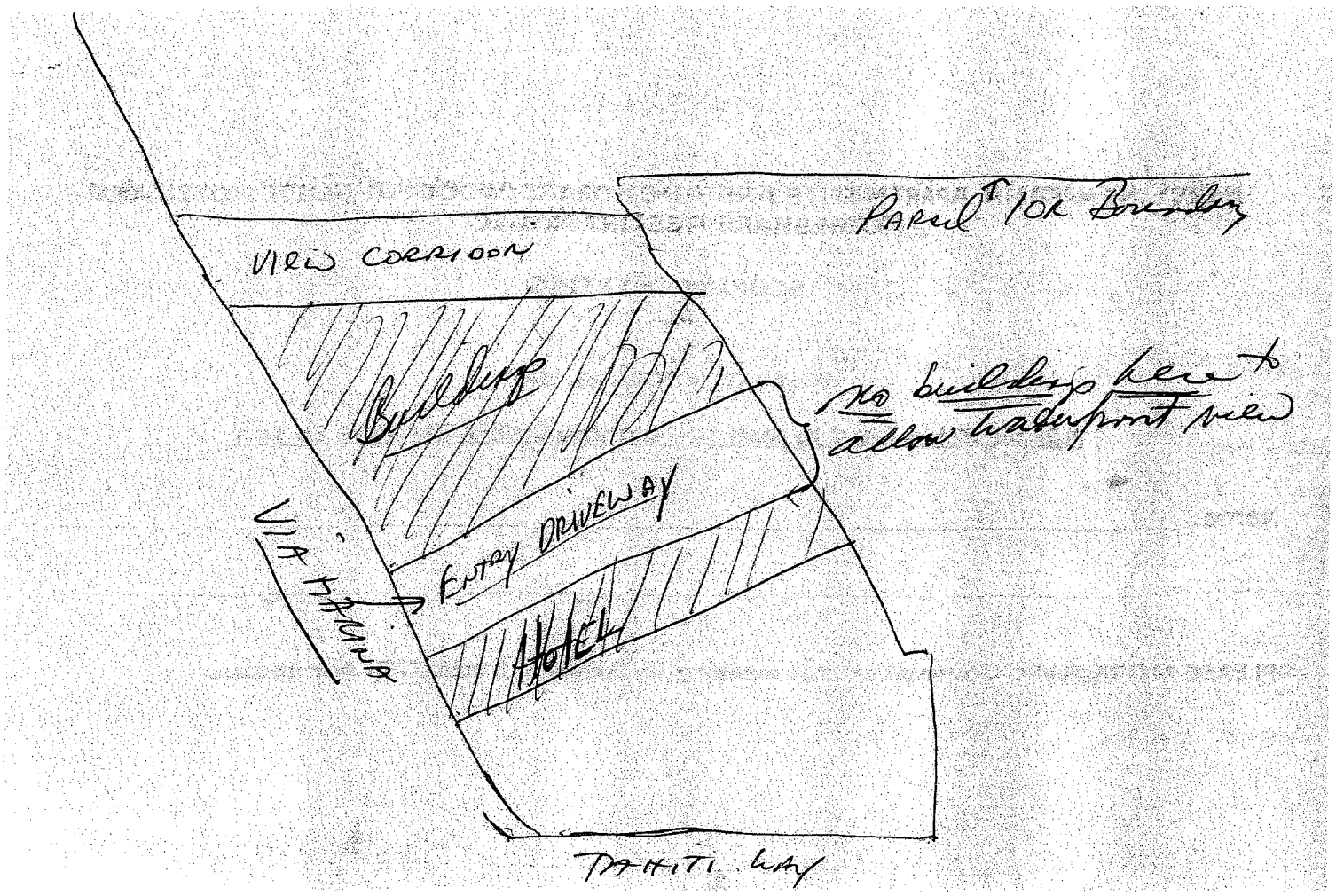
Name: Diane G. Hall

Address: 4350 Via Dolce #310

City/State/ZIP: Marina del Rey, CA 90292

Lead Agency Contact:

Rick Kuo
County of Los Angeles
Department of Regional Planning
320 West Temple Street, Room 1348
Los Angeles, CA 90012-3225
Fax: (213) 626 0434


PARCEL FOR BUILDING
VIEW CORRIDOR
Building
no buildings here to allow waterfront view
ENTRY DRIVEWAY
VIA FAUNA
HOTEL
TAHITI WAY

April 23, 2007
Scoping Meeting

To: Mr. Rick Kuo
Department of Regional Planning
Fax (213) 626 - 0434

Land Use:

- Marina del Rey is public land, designated for public recreation. Commercial and residential development were an accepted compromise to the original mandate, necessary to service the debt incurred to fund local obligations of Marina construction. Once the bond was fully paid, the promise was for reversion to recreational use at the end of the buildings' useful life. The bond was paid in full in 1993. Further compromise at this time to the priority land use of the Marina—free and low-cost public recreation—is unwarranted. The people of Los Angeles County are being robbed of even more of their recreational assets, without their knowledge or consent. A Master Plan is needed for Marina del Rey, before any more projects move toward completion, to assure that land use allocations are balanced and fair, as well as to ensure that universal and cumulative environmental impacts are understood and resolved or fully mitigated.

- The fact that Parcel FF, designated for park development in our LCP, is being turned over to private development without first obtaining the required LCP amendment, is disturbing. The County should be ashamed for acting with such blatant contempt for public policy and law. Approval of the citizens is mandatory to effect what would be a de *facto* privatization of the land in Marina del Rey for the benefit of a few. At a minimum, the California Coastal Commission needs to assess Coast Act ramifications before any approvals are sought. The environmental impact of the County's actions is piecemeal destruction of nearly all the open space in Marina del Rey.

- These projects violate the intent of our LCP to carry out California Coast Act goals to preserve our coastal resources for public access and enjoyment, by seeking to double up, or "piggyback," open space and view corridor requirements for multiple projects. The land and the infrastructure will not support this density of development, and the people of LA County will not support the theft of our resources by this means. Open government dictates notice and outreach to all the people of Los Angeles County, and the formulation of a Master Plan with our participation and approval.

- The Woodfin project, contrary to our LCP Land Use Plan stipulation, is totally out of character with the surrounding area. It is a hotel in the middle of a residential area. It is 19 stories where nothing in the vicinity even comes close. It is on a waterfront parcel that is prioritized for marine-dependent use, and limits height to support the "bowl concept." Other than the pea-sized wetland park, there is little here to serve the hotel guest. Bicycle rentals, the beach, picnic areas, taxicabs, windsurfer rentals, restaurants, etc. are clustered at Mothers Beach. There is nothing in any of the Marina plans to suggest why visitors are going to suddenly start flocking to Marina del Rey, when no additional recreational resources are being developed, and existing hotel occupancy is less than full. What is the current occupancy rate of Marina hotels? What is the rationale behind adding so many new hotel rooms? Why would anyone want to pay a lot of money to stay in a place that is overcrowded but has no means of getting around other than by car, with inadequate parking anywhere one might wish to go?

- The Woodfin developer intends the top 8 floors of the project for timeshare sales. This land use is not visitor-serving but, in fact, would be a residential ownership program. As such, it does not

qualify for the exception to height limitations for waterfront parcels; only the first 11 floors qualify for the exemption, if indeed an exemption should be allowed at all.

Wind effects:

- Marina designers laid out the harbor for optimum safety and convenience for boaters; the north basins were configured to allow direct up-wind or down-wind docking under prevailing wind conditions, for traditional dock configuration of slips parallel to the piers. The Woodfin Project's initial wind study erroneously stated that, since boats would be in the final stages of docking, a small shift in wind would not matter. In fact, docking and undocking are precisely the times that wind matters most, because maneuvering into the slip with many boats nearby presents the most hazards. Each project's wind study indicated "minor" shifts in wind patterns. What effect will the ***combined*** projects have on wind in Basin B? in Basin C? What will be the combined impacts to wind speed and wind direction from these and nearby projects (The Tides, Esprit I, Esprit II, Del Rey Shores)? Has a cumulative wind study been done assessing the impacts from all anticipated redevelopment? How will boater safety be affected, especially for boats without bow thrusters? for boats without engines?

- What will be the impact on winds for sailors in the basins? Will the wind be sustained along the full length of the basin, allowing one to sail to the transient docks, for instance, without being impaired by wind shadow from the projects? (wind shadow from the Esprit I buildings is noticeably trickier than that of original projects with open garages at ground level)

Transportation/Traffic:

- How will the combined Neptune Apartments and Woodfin Hotel/Timeshare traffic affect the cumulative traffic increases anticipated from Esprit I, Esprit II, The Shores, and Marina Harbor redevelopment? Has a cumulative traffic study been made adding all the additional car trips from proposed projects to the traffic assumptions (as well as existing ones and those under construction)? Has the impact of development in the surrounding City of LA jurisdiction been taken into account?

- Has a traffic study been made anticipating all of the additional redevelopment in Marina del Rey to show how each development zone will be affected by traffic generated in other development zones (both existing and proposed)?

- Where are the sidewalks in the residential areas? (see "Safety" section for discussion)

- Where is the Marina shuttle stop for this project? Shuttle stops need to be pull-out lanes; having the shuttle bus stop in a lane of traffic will not improve the traffic situation.

- Where is the bicycle lane, and bicycle access and parking, for this project? It is dangerous in the extreme for anyone in the residential area to bicycle around the Marina. Only experienced riders dare to brave Via Marina or Admiralty Way traffic. The only ways to access the coastal bicycle trail are to take Via Marina to Washington, and ride outside the Marina eastward to the Admiralty Park connector, or ride along Via Marina to Admiralty Way and pick up the trail at the Library. Either route risks life and limb on via Marina. Homeward bound is worse. Result: low bicycle ridership among Marina residents. Bicycle lanes are ideally addressed by a Master Plan.

- What are the anticipated impacts of, and mitigations for, the anticipated damage to the surrounding streets by the construction vehicles for these projects?

Safety:

- Why are there no sidewalks along the western mole roads? We need sidewalks along routes of transit, for pedestrian access to the Marina Shuttle and other transit options. People who want to walk for transportation rather than recreation cannot do so safely because they must do it on the roadways. The Waterfront Promenade is not convenient, nor does it lead where they need to go, particularly for the elderly who are unable to drive and often physically impaired. Recently I saw a woman using a walker struggling up Panay Way, trying to keep as near to the curb as possible and having a difficult time because of uneven pavement. Her choices were to 1) go hundred of steps out of her way to use the promenade, 2) walk through the parking lot dodging cars and then wheel across the landscaped planter to the crosswalk at Via Marina, or 3) take her chances that cars would avoid her in the street. She chose the street. Those who opt for the promenade must cross parking lots and use driveways from basin to basin, without a marked safety zone of any kind; parents with young children in tow often use these routes. Alternate transportation for pedestrians NEEDS to be given maximum priority throughout the Marina, not just for looking at the boats, but also for actually getting from place to place! Again, this is something best addressed with a Master Plan.

- How effectively can emergency personnel (fire, EMT, police) access any of the units in the projects? Does the massing of the buildings impede rapid access to any of the units? How much will added traffic slow emergency services to all occupants in the Marina? What measures will be taken during construction to ensure that construction vehicles and materials do not impair emergency access either to the site or to residents further along the mole road? What measures have been taken to improve emergency access in the design of the projects?

- Is there an evacuation plan for Marina del Rey in the event of a tsunami? Earthquake? Terrorist attack? Gas leaks or explosions from underground wells? How will the added traffic effect evacuation times, and the safety of all residents and visitors? What measures will the Lessees employ to assure the occupants' safety in the event of an evacuation?

Noise:

- Because of traffic concerns, many hotel and restaurant services are provided during late night or early morning hours. What impacts will a hotel in the middle of a residential area have on the noise and pollution disturbance to nearby sleeping residents?

- Where will the physical plants (HVAC, laundry, kitchen, etc) of the Woodfin project be located? Will this noise impact the quiet enjoyment of neighboring residents? Is there an absolute prohibition against the use of the helipad for anything other than an official emergency?

- Where will garbage collection take place? Will it disrupt neighboring residents or occupants onsite? (the Marina City Club has a notoriously bad design for garbage collection; it should be studied for "how NOT to do it")

- Where is the staging area for moving vans? At most projects in the Marina, moving days are a nightmare for everyone in or near the project, because there is no service area for moving vans. They park along the mole road, make their own staging area behind the truck, and then roll their loads along the street to the garage entrance or other point of entry. Considering the current congestion in the Marina, this can no longer be neglected in the overall design components.

Height limits:

- The LCP clearly mandates a 45-foot height limit on waterfront parcels. Why do the Neptune project buildings exceed the MAXIMUM height allowance?

- The NOP states that the Woodfin hotel project has a height allowance of 225 feet exclusive of rooftop appurtenances. The 225' maximum is already an abomination on Parcel 9U. 225' should be the maximum height, period. (see also additional concerns raised earlier about qualification of timeshare for hotel exemption)

- The NOP describes projects heights "from grade level." The lowest existing grade level of a parcel, i.e., the top of the sea wall, should be the the presumed grade level for height limitations.

Wetlands/ESHA:

- The California Coast Act requires setback from an ESHA of 100 feet, yet the Woodfin hotel/timeshare provides only a 20' buffer. Considering the sensitivity of the wetland biota, what measures are being taken to prevent impacts from the hotel of chemicals that may be used in landscaping? Have landscaping plans been designed to channel runoff away from the wetlands park, which will be at a lower elevation? The project is not designed with protection of the ESHA as its primary goal, as required in the LCP, or the setback would be greater.

- What measures have been taken to prevent other chemicals used by both projects (cleaning agents, air-freshening agents, pest control, paints, etc.) from harming the plants (either by direct contact or from the fumes emitted by the chemicals) insects and other wildlife of the wetlands park?

Parking:

- There is no parking designated for boaters in the project NOP. Where are the dedicated boater parking spaces, and how many will be reserved for exclusive use of boaters and their guests?

- Will transferring gear from boaters' cars to their boats be convenient? Will the means of access between their boats and cars create any disturbance or security risk to apartment tenants?

- With the elimination of public parking on Lot FF, where will public parking be located for visitors to the proposed wetlands park? The LCP specifically requires convenient public parking for public recreational opportunities, and if there is no convenient public parking then the park and that entire section of the waterfront promenade will become more or less the exclusive domain of hotel patrons and residents.

- Because the proposed wetlands park purports to serve an educational purpose, what accommodation has been made for school bus parking nearby? Are there facilities to serve these children before and after their visit to the park (restrooms, water fountains, etc.)?

- Assuming 1 car per bedroom, 1 car per timeshare unit, and 1 car per non-transient boat slip, these two projects will require 1,022 parking spaces for residents. That leaves 490 spots remaining to accommodate:
  - Apartment managers & maintenance staff
  - Dockmaster & staff

- Hotel employees: managers, desk clerk, bellmen, concierge, housekeepers, room service personnel, maintenance/engineering, security, spa personnel, office staff, etc.
- Restaurant employees: manager, maitre d', servers, cooks, busboys, bookkeeper
- Hotel guests
- Restaurant patrons
- Meeting room patrons
- Cocktail lounge patrons
- Boater services: boat washing, bottom scraping, repairs; yacht brokers & prospective buyers
- Guests of apartment tenants
- Housekeepers, babysitters & other service personnel of residents
- Building services: cable tv, plumbers, HVAC service, repairmen, exterminators, deliveries, armored truck collections, provisioners, linen services, inspectors, etc.
- Last, but not least: Public visitors to the promenade and wetlands park

➢ Is parking even minimially adequate? Considering there will be no nearby public parking lot to accommodate public visitors, and the high demand for both public and private visitor parking on holidays or summer weekends, shouldn't parking requirements be increased? The LCP clearly intends that private development will accommodate overflow public parking demand on such occasions, not the other way around.

Infrastructure:

➢ Will the sewer infrastructure be adequate for the increased demand from these two projects? There have been too many sewage spills from the Hyperion Treatment Plant due to capacity overloads in recent years, causing great damage to the ocean ecosystems and raising serious health concerns for denizens of the coastal zone. The additional sewer line approved for the Marina may adequately remove the wastewater, but is there enough capacity being added at the Hyperion plant so wastewater won't spill untreated into our ocean and revisit us through our Main Channel "front door"? Is capacity being built elsewhere?

➢ The sea wall has numerous "voids" that are a major concern to the safety and functioning of the Marina harbor. How will these construction projects impact the sea wall? Does the pile-driving impact the deterioration of the sea wall? If so, what costs will be paid by the developers to assist with sea wall repairs? How will this affect the implementation and timing of those repairs?

➢ What impact will construction of a high-rise building on the waterfront have on the sea wall? What long-term impact will a high-rise structure have on the sea wall? Will the developer pay the ongoing cost of mitigation or will this be a taxpayer burden?

➢ Does the orientation of slips perpendicular to the sea wall create greater turbulence impact to the sea wall? If so, will the developer be required to re-orient the docks so slips are parallel to the sea wall?

Wildlife:

➢ Esprit I, further down Marquesas Way, is building all of its stories out to the minimum setback from the street (no sidewalk). Shadows in the afternoon completely enshroud the trees in the Marquesas median, and have driven out the night herons and other birds that used to roost there. Driving down the mole road, one senses that all the light and warmth have been sucked out of the air near those buildings. What setbacks to the upper stories of the Neptune project have been designed to prevent further displacement of Marina del Rey bird life? What will the impact on median vegetation be?

- Will the developer be required to replace median vegetation with shade-tolerant plants? Will the developer be required to replace any vegetation that shows significant reduction in vitality due to lack of light, added traffic pollution, or loss of bird and insect life that facilitates pollination?

- There are numerous large-canopy trees on the Neptune project sites. Will these be preserved? If not, will there be at least as many large canopy trees planted as replacements? Will these trees be mature trees offering good oxygen production, or saplings requiring years to mature? (please, no more palm trees!) If very young trees are allowed, what oxygen-producing/CO2-reducing mitigations will be mandated on-site?

- These large trees also provide habitat for many birds. Has a bird survey of these trees been made, and what steps are being taken to provide replacement habitat during construction to prevent loss of these birds in either the near or long term?

Pets:

- Pets—dogs—are a huge problem. Much of the waterfront promenade, particularly at the newer projects, is a "mine field" due in part to lack of owner courtesy, but also due to the lack of a dedicated place to walk their dogs. With the demise of sun and warmth, the mole roads are less popular and the lawns and ground cover, which provide off-path alternatives with easier clean-up, are nowhere to be seen in the new projects. Even in cases where an owner attempts to clean up, there is often a smear that, in addition to foul smell and unsightly appearance, eventually ends up in the marina water, contributing to poor water quality. Where are the dog runs that should be a part of any urban community? This element is missing from the "urban design" concept being thrust upon us without any master planning.

Piggybacking:

- It is reprehensible that the County would allow open space "replacements" for one developer to be combined with the "view corridor" requirement of another developer and stacked onto one narrow space. Currently we have two grand waterscapes (one of which is hidden behind green tarp); these proposals replace them with one skinny vista. Part of the reason for this is an absurd "credit" for transient dock development (which is being done to satisfy the "visitor-serving" prerequisite for height exception!). How anything ***on*** the water can satisfy the requirement for a view ***of*** that water defies logic. This demands a detailed discussion of the lack of compliance with the aims of both the LCP and the Coast Act. Piggybacking facilitates the destruction of much of our coastal resources, and that which remains is being co-opted for private exploitation.

Together,
We ARE Marina del Rey,

Nancy Vernon Marino

Nancy Vernon Marino
13700 Tahiti Way #249
Marina del Rey, CA 90292

→ PLEASE DELIVER TO: RICK KUO

Public Input Form
Scoping Meeting
The Neptune Marina Apartments and Anchorage/ Woodfin Suite Hotel and Timeshare Project
County Project #'s R2006-03647 (10R), R2006-03652 (FF), R2006-03644 (9U North), TR067861 & R2006-03643 (9U South)

4/30/07

April 23, 2007

Required Approvals:

- Coastal Development Permits
- Conditional Use Permits, Parking Permits, Variances
- Subdivision Map, Plan Amendments

This form allows you to make comments on what you believe should be addressed in the Environmental Impact Report. You may submit your comments at this scoping meeting or mail to the Lead Agency Contact listed below. Written comments on the Notice of Preparation (NOP) for the Environmental Impact Report will be accepted until **April 30, 2007 at 5:00 P.M.**

Comments: THANK YOU FOR THE OPPORTUNITY FOR COMMENTARY:

1. PHOTOGRAPHS OF THE NEPTUNE MARINA TOWNHOMES, WITH LANDSCAPING & TREES ON 10R SITE AS CURRENTLY EXIST IN 2007, WATER & LANDSIDE VIEWS
2. AN INVENTORY OF ALL TREES ON PARCEL 10R, NEPTUNE MARINA – INDICATING TREE TYPE, QUANTITY AND HEIGHT.
3. A DOCUMENTATION (INVENTORY) OF ALL LANDSCAPED, 'OPEN SURFACE' AREAS, INCLUDING GRASS LAWNS & PATHWAYS BETWEEN BLDGS, ACREAGE

You may also indicate if you would like to receive notices for hearings on the project. If you wish to have a notice, please be sure to include your name and full address. The EIR will be available at local libraries and the County offices and, for a charge, individual copies may be obtained through a bonded blue printer.

Name: SUSAN WILSON

Address: 4322 VIA MARINA NO. D

City/State/ZIP: MARINA DEL REY, CA 90292

Lead Agency Contact:

Rick Kuo
County of Los Angeles
Department of Regional Planning
320 West Temple Street, Room 1348
Los Angeles, CA 90012-3225
Fax: (213) 626 0434

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APR 30 2007

Public Input Form
Scoping Meeting
The Neptune Marina Apartments and Anchorage/ Woodfin Suite Hotel and Timeshare Project
County Project #'s R2006-03647 (10R), R2006-03652 (FF), R2006-03644 (9U North), TR067861 & R2006-03643 (9U South)

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Comments: The waterfront space following by the Woodfin Suite Hotel project, ~~facility~~ building cannot in any way, it seems obvious to me be considered to allow the 40% open space mandated by the Marina Local Coastal Program/PLAN. Alternative proposal: eliminate the portion of the Waterfront Restaurant/Bar, Meeting Room + Conference Room buildings directly adjacent to the Hotel and EAST of the Entry Corridor (driveway) → see attached

You may also indicate if you would like to receive notices for hearings on the project. If you wish to have a notice, please be sure to include your name and full address. The EIR will be available at local libraries and the County offices and, for a charge, individual copies may be obtained through a bonded blue printer.

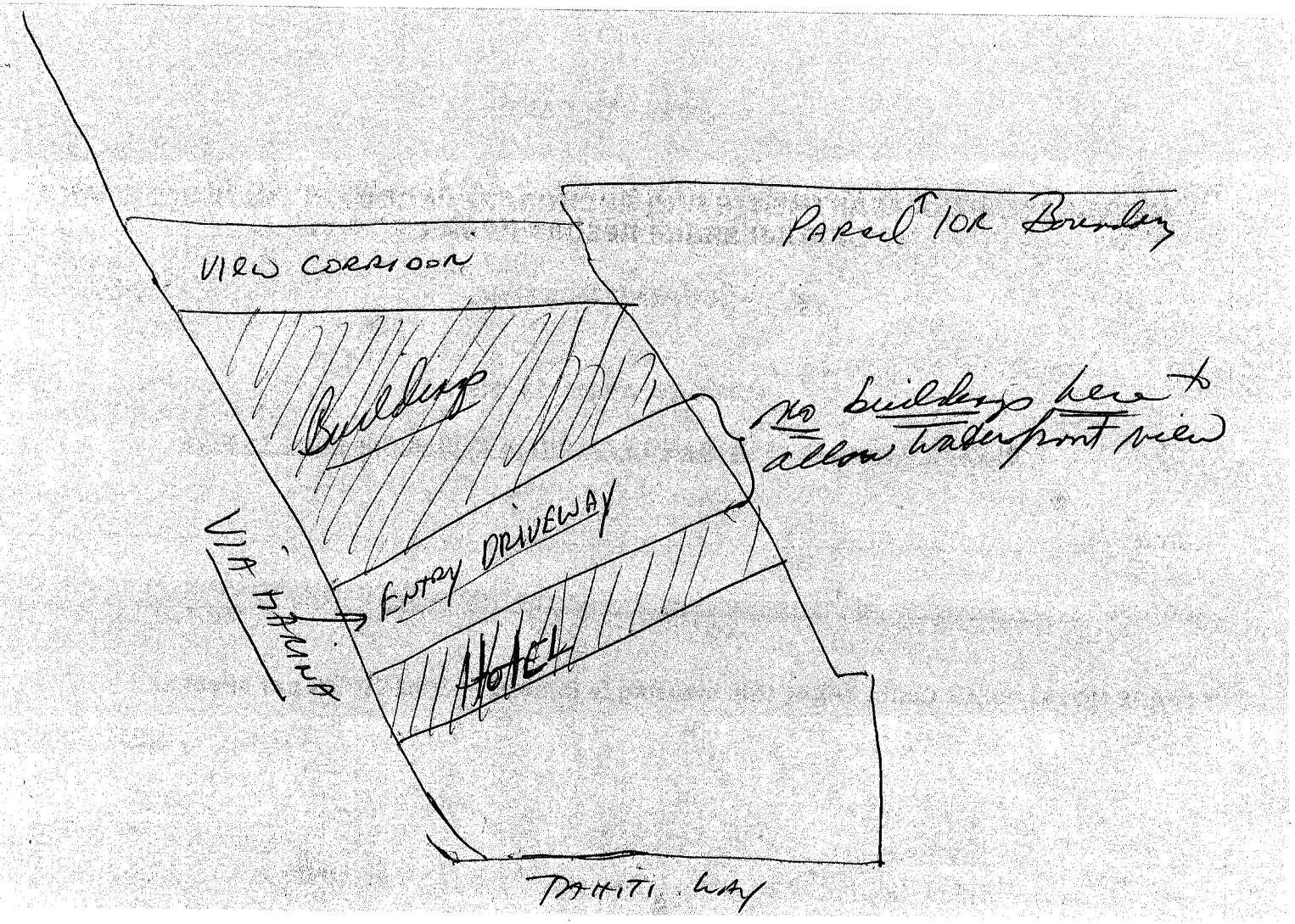
Name: [illegible]

Address: 4350 Via Dolce #310

City/State/ZIP: Marina del Rey, CA 90292

Lead Agency Contact:

Rick Kuo
County of Los Angeles
Department of Regional Planning
320 West Temple Street, Room 1348
Los Angeles, CA 90012-3225
Fax: (213) 626 0434


VIEW CORRIDOR
PARCEL 10R BOUNDARY
Building
no buildings here to allow waterfront view
ENTRY DRIVEWAY
VIA MARINA
HOTEL
TAHITI WAY

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

DONALD L. WOLFE, Director

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

RECEIVED

April 26, 2007

IN REPLY PLEASE REFER TO FILE: LD-0

TO: Paul McCarthy
Department of Regional Planning

Attention Rick Kuo

FROM: Rossana D'Antonio
Land Development Division

RESPONSE TO NOTICE OF PREPARATION
PROJECT NOS. R2006-03643, 44, 47, AND 52
VIA MARINA AND MARQUESAS WAY
COUNTY UNINCORPORATED AREA
MARINA DEL REY

We reviewed the Notice of Preparation for an Environmental Impact Report (EIR) for Project Nos. R2006-03643, 44, 47, and 52 for the Neptune Marina Apartments and Anchorage. The following comments are for your consideration:

Environmental Safety

Construction projects with a total value of over $100,000 and demolition and grading projects in the County's unincorporated areas are required to recycle or reuse 50 percent of the construction and demolition debris generated per the County's Construction and Demolition Debris Recycling and Reuse Ordinance. A Recycling and Reuse Plan must be submitted to and approved by our Environmental Programs Division before a construction, demolition, or grading permit may be issued.

The California Solid Waste Reuse and Recycling Access Act of 1991, as amended, requires each "development project" to provide an adequate storage area for collection and removal of recyclable materials.

The Los Angeles County Building Code, Section 110.4 requires that buildings or structures adjacent to or within 200 feet (60.96 m) of active, abandoned or idle oil or gas well(s) be provided with methane gas protection systems. Our records indicate this project site contains or lies within 200 feet of active, abandoned or idle oil or gas wells. This issue should be addressed and mitigation measures provided. Our Environmental Programs Division must be contacted for issuance of necessary permits

Should any operation within the subject project include the construction, installation, modification or removal of underground storage tanks, industrial waste treatment or disposal facilities, and/or storm water treatment facilities, our Environmental Programs Division must be contacted for required approvals and operating permits.

Sewer

The County of Los Angeles Department of Public Works Consolidated Sewer Maintenance District is responsible for the operation and maintenance of the local sewers within Marina del Rey. Although the proposed project will create capacity problems due to increase in population, the sewer capacity study and upgrade plans prepared by our Design Division for the area, if implemented, would adequately address the sewer capacity issues. The EIR should cite the above study titled "Maximum Build-Out Development Parcels" as a mitigation measure for the anticipated sewer capacity problems.

Water

This project is located in the service area of Los Angeles County Waterworks District's Marina Del Rey Water System. Pursuant to SB-610, a water supply assessment for the proposed development should be prepared and incorporated in the EIR. Water system requirements for the project will be determined when the applicant requests water service.

Geotechnical

All the geotechnical issues discussed in the Initial Study and Notice of Preparation should be addressed in the EIR. The project site is located within a mapped potentially liquefiable area, per the State of California Seismic Hazard Zone Map, Venice Quadrangle. Geotechnical reports evaluating the project including the proposed high rise building and anchorage, and recommending mitigation measures for the geotechnical hazards should be included in the EIR.

Traffic

Neptune Marina Apartments and Anchorange is estimated to generate a net increase of approximately 1,017 vehicle trips daily, with 92 and 85 vehicle trips during the a.m. and p.m. peak hours, respectively. Neptune Marina Apartments is estimated to generate approximately 499 vehicle trips daily, with 44 and 41 vehicle trips during the a.m. and p.m. peak hours, respectively. Woodfin Suite Hotel/Timeshare Resort is estimated to

generate approximately 1,588 vehicle trips daily with 117 and 102 vehicle trips during the a.m. and p.m. peak hours, respectively. The three projects combined are estimated to generate a net increase of approximately 3,104 daily vehicle trips, with 253 and 228 vehicle trips during the a.m. and p.m. peak hours, respectively.

We agree with the environmental assessment in the Notice of Preparation that the project may have significant impact to County and County/City roadways and intersections in the area. We would like the opportunity to review the related environmental documents and traffic study upon their completion. The County's methodology shall be used when evaluating the County and/or County/City intersections. The applicant must confer with Caltrans, City of Los Angeles, and Culver City in order to select the methodology to use when determining the impact to the freeways and the transportation circulation system within their respective jurisdictions. The traffic impact study shall also address the cumulative impacts generated by this and nearby developments by including the level of service analysis for the affected roadways, intersections, and freeway facilities. Upon identifying impact, the traffic study must identify feasible mitigation measures. Our Traffic Impact Analysis Report Guidelines may be obtained on the Department's website at http://ladpw.org/Traffic.

If you have any questions or require additional information, please contact Conal McNamara at (626) 458-4948.

CM:ca
P:\CEQA\NeptuneMarinaApartmentsandAnchorage

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • www.aqmd.gov

RECEIVED
APR 02 2007

March 28, 2007

Mr. Rick Kuo
County of Los Angeles
Department of Regional Planning
320 West Temple Street, Room 1348
Los Angeles, CA 90012

Dear Mr. Kuo:

Notice of Preparation of a Draft Environmental Impact Report for The Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project

The South Coast Air Quality Management District (SCAQMD) appreciates the opportunity to comment on the above-mentioned document. The SCAQMD's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the Draft Environmental Impact Report (EIR). Please send the SCAQMD a copy of the Draft EIR upon its completion. **In addition, please send with the Draft EIR all appendices or technical documents related to the air quality analysis and electronic versions of all air quality modeling and health risk assessment files. Without all files and supporting air quality documentation, the SCAQMD will be unable to complete its review of the air quality analysis in a timely manner. Any delays in providing all supporting air quality documentation will require additional time for review beyond the end of the comment period.**

Air Quality Analysis

The SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. Alternatively, the lead agency may wish to consider using the California Air Resources Board (CARB) approved URBEMIS 2002 Model. This model is available on the SCAQMD Website at: www.aqmd.gov/ceqa/models.html.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips should be included in the analysis.

The SCAQMD has developed a methodology for calculating PM2.5 emissions from construction and operational activities and processes. In connection with developing PM2.5 calculation methodologies, the SCAQMD has also developed both regional and localized significance thresholds. The SCAQMD requests that the lead agency quantify PM2.5 emissions and compare the results to the recommended PM2.5 significance thresholds. Guidance for

calculating PM2.5 emissions and PM2.5 significance thresholds can be found at the following internet address: http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html.

In addition to analyzing regional air quality impacts the SCAQMD recommends calculating localized air quality impacts and comparing the results to localized significance thresholds (LSTs). LST's can be used in addition to the recommended regional significance thresholds as a second indication of air quality impacts when preparing a CEQA document. Therefore, when preparing the air quality analysis for the proposed project, it is recommended that the lead agency perform a localized significance analysis by either using the LSTs developed by the SCAQMD or performing dispersion modeling as necessary. Guidance for performing a localized air quality analysis can be found at http://www.aqmd.gov/ceqa/handbook/LST/LST.html.

It is recommended that lead agencies for projects generating or attracting vehicular trips, especially heavy-duty diesel-fueled vehicles, perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis") can be found on the SCAQMD's CEQA webpages at the following internet address: http://www.aqmd.gov/ceqa/handbook/mobile_toxic/mobile_toxic.html. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutants should also be included.

Mitigation Measures

In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the SCAQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additional mitigation measures can be found on the SCAQMD's CEQA webpages at the following internet address: www.aqmd.gov/ceqa/handbook/mitigation/MM_intro.html Additionally, SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required. Other measures to reduce air quality impacts from land use projects can be found in the SCAQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. This document can be found at the following internet address: http://www.aqmd.gov/prdas/aqguide/aqguide.html. In addition, guidance on siting incompatible land uses can be found in the California Air Resources Board's Air Quality and Land Use Handbook: A Community Perspective, which can be found at the following internet address: http://www.arb.ca.gov/ch/handbook.pdf. Pursuant to state CEQA Guidelines §15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed.

Data Sources

SCAQMD rules and relevant air quality reports and data are available by calling the SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's World Wide Web Homepage (http://www.aqmd.gov).

The SCAQMD is willing to work with the Lead Agency to ensure that project-related emissions are accurately identified, categorized, and evaluated. Please call Charles Blankson, Ph.D., Air Quality Specialist, CEQA Section, at (909) 396-3304 if you have any questions regarding this letter.

Sincerely,

Steve Smith

Steve Smith, Ph.D.
Program Supervisor, CEQA Section
Planning, Rule Development and Area Sources

SS:CB:li
LAC070323-01LI
Control Number

tom

County of Los Angeles
Sheriff's Department Headquarters
4700 Ramona Boulevard
Monterey Park, California 91754-2169

Leroy D. Baca, Sheriff

April 19, 2007

Gary T.K. Tse, Director
Facilities Planning Bureau
Los Angeles County Sheriff's Department
1000 South Fremont Avenue
Building A-9 East, 5th Floor, North
Alhambra, California 91803

RECEIVED
APR 19 2007
#194
FACILITIES PLANNING BUREAU
ADMINISTRATIVE SERVICES DIVISION

Dear Director Tse:

RE: NOTICE OF PREPARATION
THE NEPTUNE MARINA APARTMENTS AND ANCHORAGE/WOODFIN SUITE HOTEL AND TIMESHARE RESORT PROJECT

Pursuant to your request, the following is a response to the Notice of Preparation for the proposed Neptune Marina Apartments and Anchorage/Woodfin Suite Horel and Timeshare Resort Project. This response is based upon the limited information provided by Impact Sciences, Inc. regarding the proposed project.

- Service Area for the Marina del Rey Sheriff's Station

The Marina del Rey Sheriff's Station provides primary law enforcement services for the unincorporated areas of Marina del Rey, Ladera Heights, Windsor Hills, and View Park. The station also provides marine law enforcement services in the Marina del Rey harbor and the Los Angeles County Maritime Region in general. The Marina del Rey Sheriff's Station does not routinely operate in the incorporated areas. However, Sheriff's personnel will occasionally assist neighboring law enforcement agencies when requested and in the event of an emergency.

- Staffing, Allocation of Personnel, Populations Served, Ratio of Deputies to the Population

Marina del Rey presently has 70 sworn employees and 20 professional staff employees assigned to the station. 18 are supervisors and/or managers, 6 are

Orig subj file cc: Gary, Adrianne, Tom o/ny attach.

detectives, 3 are assigned to special operations, and 14 are assigned to staff the harbor operation boats. The field deployment consists of four deputies on day shift and six deputies working the evening and graveyard shifts. Two of these deputies on each shift are assigned to the unincorporated area of Marina del Rey. Additionally, on all shifts there is an assigned field sergeant and a two person boat crew deployed in the harbor.

The 2000 census noted approximately 26,000 permanent residents in the communities patrolled by the station (Marina-8,176, Ladera Heights-6,568, View Park-Windsor Hills-10,958). The Marina del Rey community also attracts a large working and tourist population. Consequently, the current deputy to population ratio varies greatly as a result of the daily and the seasonal influx of visitors traversing the community area.

- Current Emergent and Routine Response Times to the Proposed Project Sites

During the period of January 1, 2006, through January 1, 2007, Marina del Rey Station personnel responded to a total of 1,669 calls for service in the reporting district encompassing the project area, and the calls are classified as follows: 41 calls were designated as emergent with an average response time of 6.1 minutes. 231 calls were designated as priority calls with an average response time of 6.7minutes, and 1,397 calls were designated as routine calls with an average response time of 18.3 minutes.

- Types and Number of Calls for Service Currently Received for the Project Site and Project Area

The following statistics are specific to the reporting district encompassing the project during the periods of January 1, 2006, through January 1, 2007. 46 % of the calls received were for disturbances (i.e., family disputes, loud music, loud vehicles, party calls, drunk persons, etc.), 13 % of the calls were received for theft related incidents (i.e., bike thefts, vehicle thefts, grand theft property, burglaries, etc.), 1 % of the calls were received for traffic related incidents, and 1% of the calls were received for vandalism.

- Relationship of the Harbor Patrol to the Sheriff's Department

In 1984, the Sheriff's Department merged with the Harbor Patrol and assumed all harbor patrol functions. Boat operations are run by Marina del Rey Sheriff's Station personnel.

- Project Affect on Harbor Patrol Operations

Based on the information provided by Impact Sciences, Inc., in September 2004, specifically that no public (visitor) or commercial slips are currently proposed for the project and that each anchorage will have sewage pump-out hook-ups for tenants only, we do not foresee an appreciable increase in the calls for service for harbor operations. Marina del Rey harbor is currently dealing with a problem wherein a number of vessels in somewhat poor condition have been evicted from slips and their owners have no permanent berths for their vessels. The four hour tie-up zone at Burton Chase Park exemplifies the problems these boaters create. They continuously abuse the purpose of the facility and increase the need for law enforcement intervention by violating County ordinances and necessitating boat impounds. If Neptune Marina and Anchorage offers public anchorage and facilities similar problems can be anticipated; and would negatively impact the current workload managed by the harbor patrol.

- Uses Proposed That Would Create new or Unique Types of Law Enforcement Requirements or Special On or Off-Site Law Enforcement problems

The proposed uses (residential units, private marina and a hotel) are not new or unique to the area. Anticipated increases in traffic congestion and calls for service are addressed in the next section.

- Specific Department Concerns regarding Construction or Operation of Neptune Marina and Woodfin Suite Hotel Project That Should be Addressed in the Draft EIR

Of the disturbance calls we have received, 35% of those calls were complaints from citizens regarding construction traffic and noise from the numerous construction projects in the area. During construction, the builder and contractor should be held responsible for any violations of the County of Los Angeles ordinances pertaining to construction noise (refer to Title 12, Chapters 12.08 & 12.12 Los Angeles County Code).

During construction and after the completion of the project there should be ample access for emergency vehicles and access for Sheriff's vehicles conducting routine patrol. Several of the existing apartment complexes in the Marina del Rey Station area have made it extremely difficult for patrol vehicles to gain access into the

parking lots or other areas (e.g., no gate access). Without adequate access, response times are extended and the ability of deputies to provide proactive policing and efficient crime suppression is diminished.

The schematics and project description do not provide enough detailed information for the Department to make specific recommendations in design that might enhance crime prevention. The Department offers for the project designers' review "Attachment A," generic design considerations for "apartment/condominium complexes" and "parks or open spaces."

The proposed project replaces an existing 136 unit apartment complex with 526 apartment units and up to 288 hotel and vacation ownership suites. Considering the net increase in residential units, as well as the fact that the project will be increasing the total number of hotel rooms in Marina del Rey by close to 30%, the impact on traffic and population density in the marina is of significant concern. The census of 2000 placed the permanent resident population in Marina del Rey at 8,176: the proposed project would probably increase that population by 10% or more.

The Department can anticipate reduced response times and an increase in the calls for service based upon heavier traffic and a denser population in the area. An increase in calls for service proportional to the increase in population is a reasonable projection. The Station presently assigns only two one deputy patrol cars in the Marina del Rey area per shift. The anticipated increase in calls for service may not, in and of itself, require the permanent assignment of additional patrol cars to Marina del Rey; however, this project taken as an aggregate with the other redevelopment projects ongoing and planned in the marina would put a significant strain on the station's resources and may necessitate additional deputy staffing.[1]

Although it appears a considerable number of parking spaces are included in the plan, the parking situation will also be exacerbated if these spaces are insufficient in number or impractical in location.

The purview for traffic planning lies with the Department of Public Works (in conjunction with the Department of Beaches and Harbors). Impact Sciences should contact Mr. William Winter of the Department of Public Works Traffic and Lighting Division, 900 S. Freemont Street, Alhambra 91803 (626-300-4700) for that department's input. Furthermore, the California Highway Patrol provides contractual traffic enforcement services to the unincorporated areas of the County, including Marina del Rey. Their input would be of value. (CHP West L.A. Division services the

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[1]The Station, as a matter of officer safety and service mandates, cannot shuffle east end cars to patrol the marina. These cars have their own communities to police, and must already respond to backup requests from the marina cars, and handle marina priority and emergent calls when the marina cars are unavailable (due to other calls, bookings, hospital runs, etc.), and vice versa.

area: 6300 Bristol Parkway, Culver City 90230, 310-642-3939.) Major thoroughfares leading into Marina del Rey, Lincoln Boulevard and Washington Boulevard, are areas within LAPD Pacific Division's jurisdiction, and will also be impacted by increased traffic. (LAPD Pacific Division, 12312 Culver Blvd., Los Angeles 90066, (310) 391-7515.

- What Mitigation is Suggested / Required for This Project

Suggested and/or required mitigation cannot be determined at this time. Based on projected population increases, there may be a necessity to increase Sheriff's Department personnel staffing levels to maintain existing service levels.

- What Fees Would Be Applicable to This Project

According to the Department's Administrative Services Division, Financial Programs unit, no Department fees are currently applicable to this project.

- Department's Ability to Serve the Project

Looking only at this individual project, Marina del Rey Station would be able to serve it; however, the Department of Beaches and Harbors has provided the station with proposed increases in total apartment units and hotel rooms for the Marina del Rey redevelopment, which will be ongoing for the next five to ten years. Including the Woodfin Project, 1,674 additional apartments are proposed, and 788 additional hotel rooms. At some point, as future redevelopment projects approach these totals and the population in the marina correspondingly grows, an increase in deputy staffing and support staff to deal with increased demands for service (and attendant response time degradation) may be necessary.

Marina del Rey Station's physical facility is small and operating at maximum capacity, in relation to staffing accommodations. If additional personnel are assigned to the station, additional space will have to be acquired. Commercial space in the marina area is considered premium real estate and would involve a substantial fiscal commitment and resources. As such, the necessity to increase staffing levels as a result of this project and future redevelopments could significantly impact the Station operations.

In light of the recent terror events of September 11th, and the Hurricane Katrina disaster, the emergency management community now fully recognizes the need to integrate evacuation procedures into a variety of response protocols. Lessons learned revealed that in the event of a catastrophic emergency, the probability exists

that there may be limited and/or insufficient public safety resources to accommodate the demands necessary to safely evacuate a 19 story hotel complex. As such, we recommend the project manager consider incorporating mass transit capabilities within the parameters of this development's fiscal administration and planning. Future mitigating plans may include strategies such as the implementation of Contraflow Traffic System, the use of wireless or reverse 911 technologies for situations such as advanced tsunami warnings, and traffic flow surveillance (webcams/GPS) to alert evacuees of the most effective exit routes.

If you have any additional questions, please contact my Operations Lieutenant, Roderick Kusch, at (310) 482-6091.

Sincerely,

LEROY D. BACA, SHERIFF

Mary D. Campbell RK

Mary D. Campbell, Captain
Commander,
Marina del Rey Station

Attachment "A"

I. APARTMENT/CONDOMINIUM COMPLEX

This guideline covers a variety of types of apartments from the small building with only a few units to the large complex encompassing several apartment buildings. This includes the multi-storied apartments as well as the sprawling garden variety.

WHAT TO LOOK FOR

The following list considers six major components of an apartment complex in which design considerations can play an important part in crime prevention. For each component, a list of questions is presented:

A. Street Patterns and Lot Plans

1. Have large complexes of apartments eliminated all but essential thoroughfares through the apartment areas without reducing fire suppression capabilities?
2. In the large apartment complexes, are the apartment buildings set back sufficiently from the perimeter streets to deter the casual passerby from entering the complex area?
3. Do street patterns and lot plans maximize social deterrents to crime by enhancing neighborhood observation and recognition?
4. Are the apartments situated on the lots to facilitate patrol observation and allow patrol access to all sides of the apartments?
5. Are the apartments arranged on the site with adequate access streets to enable the police to respond quickly in an emergency?
6. Are streets well lighted?

B. Parking

1. Is an off-street garage parking area available for tenants and some spaces for visitors to reduce on-street parking to a minimum?
2. Is the tenant off-street parking area in a secure place, with an access control device which limits entrance and exit from the area to authorized tenants only?
3. Is this well lighted?
4. Are technological devices needed in the parking area, such as CCTV and sound devices to provide adequate security?

Attachment "A"

5. Is the parking area situated in a manner that it does not provide access to any of the apartments other than for authorized persons?

C. <u>Structural</u>

1. Are all the entrances clearly visible to patrols or neighbors.

2. Are the number of entrances at a minimum and, where possible, require passage through some central point such as the lobby where a clerk could be on duty?
3. Can entrances to the building from the parking structure be tightly secured?
4. Is there adequate lighting at the entrances?
5. Are unobservable windows kept to a minimum, especially on the first floor?
6. Are the stairwells open and able to be observed at all times from public areas?
7. Could the elevator use a shaft that would be observable from a public area - such as a glass shaft on the outside of the building?
8. Is the elevator equipped with a security alarm button that would sound a silent alarm and automatically send the elevator to the first floor?
9. for the smaller apartment building, do the apartments open onto a central court and face one another without unduly increasing the noise factor?
10. Are the number of units per building relatively limited to facilitate a sense of community and mutual observations?
11. Are storage areas outside of tenants' apartments required? If so, are they located in a secure area, i.e. somewhere remote and not visible from an adjacent street?
12. Does each apartment have their own storage area with access limited to their use only? Are storage ares secure?
13. Is there need for a service entrance? Is it located to provide selective access and not to create an entrance way for criminals into the complex?

D. <u>Walkways</u>

1. Are the walkways situated to generate enough traffic to provide a deterrent by virtue of the number of people using or observing the walkway at all times?
2. Are they routed past areas where the public is likely to congregate?

3. Are they wide enough to permit clear observation?
4. Are they sufficiently straight to provide adequate observation?
5. If they will be utilized at night, are they adequately lighted?
6. Have the walkways been landscaped in a manner as to provide minimum concealment for would-be attackers?
7. Are there access roads nearby so that emergency vehicles can get relatively close to any point on the walkways?
8. Are there any unnecessary indentations which would provide hiding places for would-be assailants?

E. Landscaping

1. Is the landscaping of the type and situated in locations so as to maximize observation while providing the desired degree of aesthetics?
2. Is the lighting used in the landscaping both for security and aesthetics?
3. Are walls planned only where they would create a desirable buffer? Then are they sufficiently high to deter circumvention? Are they situated in a manner so as not to provide concealment for a would-be attacker? Would it be feasible to use a chain link fence instead?

F. Miscellaneous

1. In those apartments which are clustered, has the developer provided recreational or other community facilities that would encourage neighbors becoming acquainted with one another? Are these areas located in places where they will receive a maximum amount of observation from the tenants?
2. If the apartments are located adjacent to a commercial zone, a school, etc., is there some buffer between them such as a large expanse of park land or high wall?
3. Has the developer included provisions for intrusion alarm systems?

II. PARKS OR OPEN SPACES

This guideline covers the factors to consider in the planning and design of a wide variety of public park areas and open spaces ranging from the small, compact park in a commercial area through the vast regional parks. The park layouts may range from highly structured and very formalized usages, e.g. tennis courts, baseball diamonds, shuffleboard courts, etc., to less formal areas for picnics, nature trails and just open expanses.

Attachment "A"

The crime potential for these areas can range across the entire spectrum of anti-social behavior, from petty vandalism through grievous assaults and mass disturbances. Physical planners and law enforcement personnel should be involved in the early stages of planning and design to introduce suggestions for physical features which might serve to prevent the commission of crimes and/or increase the ability of law enforcement agencies to respond in the event of a crime.

WHAT TO LOOK FOR

The following list considers six major components of a public park or open space in which physical features might make a significant contribution to the prevention or deterrence of crime. The questions are designed to illuminate the crime prevention possibilities.

A. Street Patterns and Park Layout

1. Are adjoining streets planned to permit observation of park areas by regular police units or special park patrols?
2. Can an access street be provided through the park without destroying the character of the park? If full access for all types of vehicular traffic would be destructive, is it possible for occasional patrol and emergency vehicles?
3. Does the proposed park require the closing of a major street with potential problems for other patrol activities?
4. Can the high volume park activities be located close to the patrol observation points?
5. Can buildings be located close to access roads to permit maximum observation?
6. Can access roads be provided to reservoirs and similar "targets" to permit maximum patrol observations?
7, Can access, or patrol roads, be laid out to permit efficient patrol and maximum observation of major activities, buildings, equipment storage areas, reservoirs and other possible crime "targets" ?

B. Parking

1. Can off-street parking be situated so that it can be readily observed from patrol and so that it does not obscure patrol observation of other park areas?
2. Is parking provided in a secure, well-lighted area? Is the parking for night activities located adjacent to the activity

centers to reduce isolation? Is there adequate lighting of these areas?

3. Are parking stalls laid out to improve, not hinder, patrol observations?

C. Buildings

1. Are buildings located near regularly patrolled streets and in areas of high activity? Are the number of entrances held to a minimum? Are entrances observable from patrol units? Are there means of gaining access to the roof? Can windows be reduced to a minimum without impairing park-like qualities? Are buildings well lighted?
2. Are restrooms located on the perimeter of the park or adjacent to patrolled streets? Can the entrances be seen from the street? Are entrances unobstructed without blind walls and small access ways? Are restrooms well lighted inside and out? Are lighting fixtures tamper-proof?

D. Storage Areas

1. Are storage areas located on perimeters and close to patrolled roads to permit maximum observation by regular patrol units?
2. Is parking provided for equipment away from buildings and fueling facilities so that unauthorized vehicles can be readily observed by patrol units?
3. Is area well lighted?
4. Does landscaping permit places of concealment from patrol units?
5. Can chain link fencing be used instead of block walls?

E. Walkways

1. Are they wide enough to permit clear observation?
2. Are they adequately lighted if to be used at night?
3. Does adjacent landscaping provide concealment opportunities?
4. Can walkways be routed through area where there are usually some people to reduce isolation?

Attachment "A"

F. Recreational Equipment

1. Can recreational equipment be located close to other activity centers to reduce isolation?
2. Can it be located close to patrolled roads?
3. Can it be secured at night?
4. Can the area be lighted at night?

Regional Allocation of Police Services
Statistical Code Summaries by Reporting Districts
From 01/01/2006 To 01/01/2007

STATION TOTALS

	Total	2760																
Part I Activity																		
Criminal Homicide	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Forcible Rape	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Robbery	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aggravated Assault	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Burglary	44	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Larceny Theft	144	144	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Theft GTA	43	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arson	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total	246	246	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Part II Activity																		
Forgery	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fraud and NSF Checks	31	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sex Offenses Felonies	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sex Offenses Misdemean	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Aggravated Assault	21	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Weapons Laws	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offenses Against Famil	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Narcotics	28	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Liquor Laws	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drunk - Alcohol/Drugs	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Disorderly Conduct	740	740	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vagrancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gambling																		
Drunk Driving - Veh/Bo	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle and Boating La	21	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vandalism	51	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Warrants	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Receiving Stolen Prope	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Off Without Mo	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Off With Money	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Felonies, Misc	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Misdemeanors, Misc	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total	1024	1024	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Criminal Activity																		
Persons Missing or Fou	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Juvenile, Non-criminal	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

County of Los Angeles
Sheriff's Department Headquarters
4700 Ramona Boulevard
Monterey Park, California 91754-2169

LEROY D. BACA, SHERIFF

May 8, 2007

RECEIVED
MAY 15 2007

Mr. Paul McCarthy
Impact Analysis Section
Los Angeles County
Department of Regional Planning.
320 West Temple Street
Los Angeles, California 90012

Dear Mr. McCarthy:

REVIEW OF ENVIRONMENTAL DOCUMENT
NOTICE OF PREPARATION
THE NEPTUNE MARINA APARTMENTS AND ANCHORAGE/WOODFIN SUITE HOTEL AND TIMESHARE RESORT PROJECT

This is in response to your Notice of Preparation (NOP) dated March 22, 2007, requesting information and comments from the Marina del Rey Sheriff's Station regarding the Notice of Preparation of an Environmental Impact Report for the Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project. For our comments, please review the attached questionnaire and responses provided by Captain Mary D. Campbell.

In summary, the Station has provided specific statistics on staffing and call responses, in answer to the questionnaire. Several areas of concern are highlighted in Captain Campbell's response including adequate provision for emergency access to the new facilities, increases in calls for service and longer response times, construction traffic and noise, and limited resources for evacuating a high-rise hotel complex. While this project by itself does not specifically create any additional requirements for the Station, it may have a cumulative impact on call and [illegible]

Should you have any additional questions regarding this matter, please contact Mr. Tom Bellizia, of my staff at (626) 300-3021.

Sincerely,

LEROY D. BACA, SHERIFF

Gary Tse by

Gary T. K. Tse, Director
Facilities Planning Bureau

APPENDIX 5.1

Geotechnical Reports

APPENDIX 5.10

Solid Waste Generation for Parcels 10R and FF

Neptune Marina Apartments and Anchorage Project
Existing Solid Waste Generation - No Recycling

Land Use	Quantity	Units	Generation Rate (1)		Total Waste Generated	
			(tpy)	(lbs./day)	(tpy)	(lbs./day)
Residential Units						
Multi-Family	136	du	1.1700	6.41	159	872
Boat Slips	198	slips			0	
				Totals	159	872

du = dwelling unit; sq.ft. - square feet; tpy = tons per year; lbs. = pounds
(1) The solid waste daily generation rates in tons per year are derived from the Ventura County Solid Waste Management Department's Guidelines for Preparation of Environmental Assessments for Solid Waste Impacts. These figures do not reflect any recycling activities on the part of the generator.

Prepared by Impact Sciences, Inc.
5/2/05

Neptune Marina Phase II
Project Solid Waste Generation - No Recycling

Land Use	Quantity	Units	Generation Rate (1)		Total Waste Generated	
			(tpy)	(lbs./day)	(tpy)	(lbs./day)
Neptune Marina Phase II						
Proposed						
Apartments	126	du	1.1700	6.41	147	808
				Totals	**147**	**808**

du = dwelling unit; sq.ft. - square feet; tpy = tons per year; lbs. = pounds
(1) The solid waste daily generation rates in tons per year are derived from the Ventura County Solid Waste Management Department's Guidelines for Preparation of Environmental Assessments for Solid Waste Impacts. These figures do not reflect any recycling activities on the part of the generator.
(2) Includes Promenade.

Prepared by Impact Sciences, Inc.
5/2/05

Neptune Marina Apartments and Anchorage Project
Project Solid Waste Generation - No Recycling

Land Use	Quantity	Units	Generation Rate (1)		Total Waste Generated	
			(tpy)	(lbs./day)	(tpy)	(lbs./day)
Neptune Marina						
Proposed						
Apartments	400	du	1.1700	6.41	468	2,564
Boat Slips	161	slips				
Project Total					468	2,564
Existing						
Apartments	136	du	1.1700	6.41	159	872
Boat Slips	198	slips				
Existing Total					159	
Net						
Aparments	264	du	1.1700	6.41	309	1,692
Boat Slips	-37	slips				
Park (2)		acres	0.2000	1.10	0	0
				Totals	**309**	**1,692**

du = dwelling unit; sq.ft. - square feet; tpy = tons per year; lbs. = pounds
(1) The solid waste daily generation rates in tons per year are derived from the Ventura County Solid Waste Management Department's Guidelines for Preparation of Environmental Assessments for Solid Waste Impacts. These figures do not reflect any recycling activities on the part of the generator.
(2) Includes Promenade.

Prepared by Impact Sciences, Inc.
5/2/05

Neptune Marina Apartments and Anchorage and Neptune Marina Phase II
Cumulative Plus Project Solid Waste Generation - No Recycling

Land Use	Quantity	Units	Generation Rate (tpy) (1)	Generation Rate (lbs./day)	Total Waste Generated (tpy)	Total Waste Generated (lbs./day)
Neptune Marina						
Aparments	264	du	1.1700	6.41	309	1,692
Boat Slips	-37	slips				
Subtotal					309	1,692
Neptune Marina Phase II						
Aparments	126	du	1.1700	6.41	147	808
Proposed Projects						
Residential Units:						
Single Family Detached	0	du	2.0400	11.18	0	0
Multi-Family or Attached (2)	4,122	du	1.1700	6.41	4,823	26,426
HotelMotel (3)	421	room	0.3650	2.00	154	842
Commercial	146,068	sq. ft.	0.0024	0.01	351	1,921
Restaurant	11,063	sq. ft.	0.0108	0.06	119	655
Office	197,058	sq. ft.	0.0014	0.01	276	1,512
Boat Slips	439	slips				
Subtotal					5,722	31,355
				Totals	**6,179**	**33,856**

Note: Numbers may not total exactly due to rounding.
du = dwelling unit; sq.ft. - square feet; tpy = tons per year; lbs. = pounds
(1) The solid waste daily generation rates in tons per year are derived from the Ventura County Solid Waste Management Department's Guidelines for Preparation of Environmental Assessments for Solid Waste Impacts, unless otherwise noted. These figures do not reflect any recycling activities on the part of the generator.
(2) Includes senior care facilities.
(3) California Integrated Waste Management Website, November 2002, which cites SWANA Technical Bulletin 85-6, Recovery Sciences 1987 and Matrix Management Group "Best Management Practices Analysis for Solid Waste."
(2) Includes senior care facilities.

Prepared by Impact Sciences, Inc.
5/2/05

GEOTECHNICAL RECOMMENDATIONS
NEPTUNE MARINA APARTMENTS
PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT
PARCELS "10R" AND "FF"
MARQUESAS WAY AND ADMIRALTY WAY
MARINA DEL REY AREA OF LOS ANGELES, CALIFORNIA

Prepared for:

LEGACY PARTNERS RESIDENTIAL, INC.
30 Executive Park, Suite 100
Irvine, CA 91614

Prepared by:

GROUP DELTA CONSULTANTS, INC.
2291 W. 205th Street, Suite 105
Torrance, California 90501
Tel. (310) 320-5100
Fax (310) 320-2118

GDC Project No. L-618
September 29, 2005

GROUP DELTA CONSULTANTS

Geotechnical Engineering

Geology

HydroGeology

Earthquake Engineering

Materials Testing & Inspection

Forensic Services

September 29, 2005

Legacy Partners Residential, Inc.
30 Executive Park, Suite 100
Irvine, CA 92614-4724

Attention: Mr. John Santry

Subject: **Geotechnical Recommendations**
Proposed Residential Apartment Development
Parcels "10R" and "FF"
Marquesas Way and Admiralty Way
Marina del Rey area of Los Angeles, California

Mr. John Santry:

Group Delta Consultants (GDC) is pleased to submit this geotechnical report for the proposed residential apartment development located at Parcels "10R" and "FF", Marquesas Way and Admiralty Way, Marina del Rey area of Los Angeles, California.

We appreciate the opportunity to provide geotechnical services for this project. Should you have any questions regarding this report, or if we can be of further service, please call us at 310 320-5100.

Sincerely,
GROUP DELTA CONSULTANTS, INC.

Michael Reader, G.E. #2259
Vice President

Ying Liu
Project Engineer

Distribution: Addressee (6)

L-618 Report Final.doc

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GEOTECHNICAL RECOMMENDATIONS
PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT
PARCELS "10R" AND "FF", MARQUESAS WAY AND ADMIRALTY WAY
MARINA DEL REY AREA OF LOS ANGELES, CALIFORNIA

1.0 INTRODUCTION

This report presents our geotechnical recommendations for development of the proposed residential apartment development project, which consists of a 4-story wood framed apartment building over a 2-level concrete parking structure with one level being subterranean. The site is located on Parcels "10R" and "FF", Marquesas Way and Admiralty Way, Marina del Rey area of Los Angeles, California. Figure 1 shows the site location.

1.1 Project Description

Parcel "10R" is an "L" shaped parcel located at the northwest corner of Basin B. Overall it measures approximately 1350 feet by 450 feet, and is currently occupied by existing apartments and parking lots. Parcel FF is a rectangular shaped parcel located at the southwest corner of Basin C. Overall, the site measures approximately 600 feet by 150 feet, and is currently used as parking lots. These structures will be demolished and removed to make room for the proposed construction. The subject site slopes gently 1 to 2 degree from Marquesas Way in the middle toward Basin B and Basin C to the south and north, and from Via Marina to the east toward Basin B. The basins are protected by sea walls that are about 10 feet in height and are supported on timber piles. The existing sea walls were recently retrofitted by installing 24-inch diameter caissons about 3 to 10 ft behind the face of the sea wall and then anchoring the sea wall to the caissons by tieback anchors.

1.2 Objectives and Scope of Work

The objective of this report is to provide site-specific geotechnical recommendations for the design and construction of the proposed structures. We performed the following general scope of work in order to fulfill the objectives of our services:

- Review of existing Geotechnical Report conducted for the subject site by Bagahi Engineering Inc., and other available geotechnical reports for projects adjacent to the subject site;

- Review of published geologic and geotechnical maps and reports pertaining to the site area;

- Conduct six CPT soundings on the subject site to supplement the existing data and to evaluate subsurface conditions;

- Perform site-specific geotechnical analyses to develop recommendations for foundation design and construction of the proposed structures; and

- Preparation of this report.

2.0 GEOTECHNICAL INVESTIGATION

2.1 Previous Geotechnical Investigation

The subject site was previously investigated by LeRoy Crandall and Associates in 1968, Leighton and Associates in 1999, and Bagahi Engineering Inc. in 2005. Leighton performed 4 borings on Parcel "10R" to a maximum depth of 56 ft, and performed laboratory tests on soil sample from their borings. Bagahi Engineering Inc. performed 8 borings and 7 CPT soundings for Parcel "10R", and 3 borings and 2 CPT soundings for Parcel "FF", and performed laboratory tests on selected soil samples from their borings. The depth of their investigation ranged from 50 to 60 ft for borings and 45 to 75 ft for CPT soundings. The details of the above-mentioned field exploration and laboratory testing results can be found in the Geotechnical Report prepared by Bagahi Engineering Inc. for the Legacy Partners, dated March 3, 2005. The boring and CPT sounding locations are shown in Figure 2. The key laboratory testing results are summarized in Table 1.

2.2 Current Field Exploration

On June 09, 2005, GDC performed six CPT soundings for the subject project site, two on Parcel "FF" and four on Parcel "10R'. The CPT soundings were performed to depths ranging from approximately 80 feet to 100 feet below the ground surface. The CPT sounding was performed in general accordance with ASTM D 3441 (ASTM, 1998). The CPT locations are shown in Figure 2, and the exploration logs are presented in Appendix A.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Subsurface Conditions

The surface of the site (Approx. El. +7.5 to +12 ft) contains man-made improvements consisting of pavement, curbing, sidewalk, buried utilities, and residential buildings. Below the improvements, the subject site is underlain by fills, hydraulic fills and native deposits predominantly consisting of sands, sandy silts and silty sands, interbedded with silty clay, clayey silts and some gravels, to the maximum explored depth of 100 ft. Generalized geotechnical cross-sections (Section A-A' to C-C') through the subject site are shown in Figure 3 through Figure 9. The generalized soil layering is listed below.

Layer No. 1: Fill and Hydraulic Fill (SP)

This layer extends from the existing grade to about EL. + 1 to -2.5 feet. This layer consists of medium dense to dense sand. The upper 6 inches of this layer is comprised of a pavement section of asphalt, concrete over gravel.

Layer No. 2: Native: Clayey Silt and Silty Clay (ML-CL)

Layer 2 is comprised of soft to firm, clayey silt and silty clay, extending from about EL. +1 and –2.5 feet to about EL -2.5 to -4.5 feet. The CPT tip resistance ranges between 6 to 20 tsf. The undrained shear strength estimated from CPT ranged 0.3 to 1 tsf.

Layer No. 3: Silty Sand and Sand Silt (SM)

Layer 3 extends from EL. -2.5 to -4.5 feet to about EL. -10 to -16 feet. This layer consists of silty sand and sand silt. The CPT tip resistance for this layer is generally below 100 tsf. The CPT sleeve friction is generally below 0.6 tsf. This layer is generally liquefiable.

Layer No. 4: Sand (SP)

A layer of dense sand is present below layer No. 3 with thickness varying from 4 to 8 feet. The CPT tip resistance ranges between 100 to more than 150 tsf. This layer does not uniformly extend throughout the subject site.

Layer No. 5: Silty Clay and Clayey Silt (ML-CL)

A layer of firm to stiff silty clay and clayey silt is present below layer No. 4 to the El. of -24 to -30 ft. The average CPT tip resistance is about 20 tsf. The average CPT sleeve friction is 1.2 tsf.

Layer No. 6: Sand (SP)

A layer of dense sand is present below layer No. 5 to the El. of -40 to -50 ft. The average CPT tip resistance is about 250 tsf. The average CPT sleeve friction is 2.2 tsf. This layer generally extends throughout the project site with varying layer thickness, except at a few locations where it is absent as indicated by CPT logs,

Layer No. 7: Sand, Silty Sand and Sandy Silt (SP-SM)

Interbedded dense sand and medium dense to dense silty sand and sandy silt exists below Layer No. 6.

3.2 Groundwater

Groundwater elevation at the project is tide dependant. Bagahi Engineering installed groundwater monitoring wells during their field exploration, and monitored groundwater fluctuations over a period of a month. They reported that the groundwater elevations varied between +3.5 to -1.0 MSL across the site. LAWGIBB Group conducted a field exploration project for a project site right next to the subject site, and reported a groundwater elevation of 0 to 3 MSL. For design purposes, the groundwater level at the subject site is considered to be at El. +5 .0 MSL.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 General

Based on the findings of our study, field exploration and engineering analysis, it is our opinion that potential adverse conditions at the project site, i.e., liquefaction induced settlement and lateral spreading, can be mitigated to an acceptable level by a properly designed foundation. The details of our recommendations to mitigate the above-mentioned seismic hazards are discussed in the following sections.

4.2 Potential Seismic Hazards

Potential geologic and seismic hazards for any site include ground rupture, slope instability, lateral spreading, subsidence, liquefaction, seismic compaction, and settlements tsunamis/ and seismic shaking.

4.2.1 Ground Surface Rupture

The site is not located within an Alquist-Priolo Earthquake Fault Zone. No known active faults are mapped as crossing the site or projecting towards the site in the geologic literature reviewed. Therefore, the possibility of ground surface fault rupture at the site is considered low. The closest active faults are the Inglewood Fault segment within the Newport-Inglewood Fault Zone and the Santa Monica fault, to the northeast and north of the site. Both of them are located at a distance of about 5 miles from the project site and are capable of generating magnitude 7.0 to 7.3 earthquakes, respectively. Palos Verdes Fault is located about 6 miles to the southwest and is capable of magnitude 7.0 earthquake. Therefore, ground rupture due to faulting is not considered a significant hazard at the site.

4.2.2 Probabilistic Seismic Hazard Analysis

The Probabilistic Seismic Hazard Maps provided by California Geologic Survey (http://www.consrv.ca.gov/CGS/rghm/pshamap/pshamap.asp) indicates that the PGA for a mean return period of 475 years is 0.45 g, for alluvium at the subject project area. The USGS Seismic Hazard Deaggregation maps indicate that for the same return period, the PGA for soft rock is about 0.41 g. The mean earthquake magnitude is reported as 6.65. In this report, a mean PGA of 0.50 and magnitude of 7.1, for 10 percent probability of being exceeded in 50 years, is used. The USGS probabilistic seismic hazard maps for the subject project site are presented in Appendix B.

4.2.3 Liquefaction Potential

Liquefaction involves the sudden loss in strength of a saturated, cohesionless soil (predominantly sand) caused by the build-up of pore water pressure during cyclic loading, such as produced by an earthquake. This increase in pore water pressure can temporarily transform the soil into a fluid mass, resulting in vertical settlement and can also cause lateral ground deformations. Typically, liquefaction occurs in areas where there are loose sands and the depth to groundwater is less than 50 feet from the surface. Seismic shaking can also cause soil compaction and ground settlement without liquefaction occurring, including settlement of dry sands above the water table.

The on-site soils primarily consist of loose to medium dense and dense silty sands and sandy silts, with thin layers of silty clay and clayey silts interbedded. The ground water generally varies between El. -1.0 to +3.5 ft.

To assess the potential for liquefaction of subsurface soils at the site, we used the simplified liquefaction analysis procedure recommended by NCEER (Youd and Idriss, 1997, 2001). We evaluated the liquefaction potential at the site using equivalent SPT blow counts from the CPT data at 15 locations to a depth of 50 ft. CPT data were used primarily because they provide a continuous measurement of blow counts and accurate stratigraphy of the site. Our analysis indicates that there is a continuous liquefiable sand layer from El. -2.5 to El. -16 ft with layer thickness varying from 5 to 10 ft. Below this layer, some liquefiable sandy material exist at varying depths with layer thickness generally less than 3 feet, and none of them are continuous throughout the site.

For estimating the resulting ground settlements, we used the method proposed by Tokimatsu and Seed (1987). Our analysis indicates that the amount of settlement that would likely occur is 1 to 4 inches. Considering the overall site variability and depth of the liquefiable layers, we estimate the differential settlements due to seismic-induced liquefaction to be on the order of 2 inches or less.

The liquefiable soil layers and liquefaction induced settlements are summarized in Table 2. The detailed liquefaction analyses are presented in Appendix C.

4.2.4 Lateral Spreading

Under cyclic loading, lateral spreading can occur on gently sloping ground or on virtually flat ground adjacent to bodies of water. For the subject site, the presence of a continuous liquefiable soil layer indicates that under severe earthquakes, if the sea wall fails, the site may subject to lateral spreading and experience permanent ground deformation. We evaluated the potential for lateral spreading at the site using computer program PCSTABL5M and based on the screening analysis outlined in SP 117 – Guidelines for Analyzing and Mitigating Landslide Hazards in California. Two cross-sections, i.e., cross-section C-C' and B-B' are analyzed to assess the lateral spreading potential toward Basin C and Basin B. The sea walls are not treated as structural elements to resist lateral spreading. Both circular and block searching methods are conducted with different searching radius. Four scenarios, including 1) existing condition, 2) building perimeter improved by a 11 ft wide soil-cement mixed wall, 3) subject site improved by 8 rows of stone columns at seawall side, and 4) eight rows of stone columns combined with the ground treatment effect as a result of pile installation, are analyzed. The result indicates that the displacement caused by lateral spreading can be reduced to less than one inch by using 8 rows of stone columns combined with the ground treatment effect by pile installation. The details of the analysis are presented in Appendix D. The key findings are listed in Table 3.

4.2.5 Other Seismic Hazards

All low-lying areas along California's coast are subject to potentially tsunami inundation. Tsunamis are long-period waves generated primarily from distant and local offshore earthquakes, landslides, or volcanic eruptions. The magnitude of the potential hazard is a function of the coastline configuration, sea floor topography, individual wave characteristics, and distance and direction from the source.

Two tsunamis, induced by the 1960 Chile Earthquake, caused damage in the Los Angeles and Long Beach harbors. In 1960, waves up to 5 feet in height occurred in Cerritos Channel, and currents up to 12 knots were reported.

Fortunately, the majority of the Southern California coastal areas do not have a significant potential to be inundated as a result of tsunamis. This is because that the predominant faults in Southern California are strike-slip faults, which generate predominantly horizontal motions; and most of the earthquake epicenters are on land (Landers and Lockridge, 1989).

A 5-ft run-up for a 100-year tsunami and an 8-ft run-up for a 500-year tsunami are predicted near the Marina Del Rey area (Ziony, Editor, 1985). The ground surface at the site generally ranges from El. +7.5 to El. + 12 ft. If the tsunami coincides with high tides, the basement of the building and the underground parking will be flooded.

4.2.6 Seismic Site Coefficients

The site is located in Seismic Zone 4. For seismic analysis in accordance with the provisions of the Uniform Building Code (UBC, 1997), we recommend the following seismic design parameters:

Parameters	**Value**	**Reference**
Seismic Zone Factor	0.4	Table 16 I
Soil Profile Type	S_D	Table 16 J
Seismic Source Type	B	Table 16 U
Seismic Coefficient, Na	1.00	Table 16 S
Seismic Coefficient, Nv	1.12	Table 16 T
Seismic Coefficient, Cv	0.72	Table 16 R
Seismic Coefficient, Ca	0.44	Table 16 Q

The response spectra constructed in accordance with Figure 16.3 of UBC 1997 may be used for the analyses. The Structural Engineer should evaluate the appropriate seismic criteria for the building design.

4.3 Foundations

As mentioned in the introduction, the proposed residential apartment development project consists of 4-story wood framed apartment buildings over a 2-level concrete parking structure with one level being subterranean. A fairly continuous liquefiable sandy material exists at the subject site, with layer bottom El. of approximately -10 to – 16 ft and layer thickness varying from 5 to 10 ft. As a result, in addition to carrying the vertical load imposed by the proposed structure, the foundation should also be able to resist liquefaction induced settlement and displacement caused by lateral spreading. We propose two alternatives to mitigate lateral spreading, and recommend that the proposed structure to be supported on pile foundation to cope with liquefaction induced settlement.

4.3.1 Lateral Spreading Mitigation: Stone Columns

As discussed previously, under severe seismic events, if the sea wall fails, the subject site may experience significant displacement due to lateral spreading. Our analysis indicates that for a threshold displacement of 5 cm (0.2 inches), the yield acceleration for the site is 0.23 g (SP 117), the factor of safety for this yield acceleration is about 1 and the computed lateral spreading is 3.8 inches. By installing 8 rows of stone columns parallel to the sea wall side, for the same yield acceleration, the factor of safety can be improved to 1.26 and lateral spreading movement can be limited to 1 inch.

Stone columns can be installed by Vibro-replacement method, which utilized a large downhole vibrator to penetrate to the full length of treatment. After penetrating to the design depth, the vibrator is withdrawn and crashed rock is filled, either from the ground surface through the void created by the vibration, or from the bottom of the vibrator (bottom-feed technique) as the vibrator is drawn. The advantages of this technique are two fold: 1) it densifies the adjacent granular soils, as is the case for the subject site; and 2) it creates a relative dense stone column and provides passages for excessive pore water pressure to dissipate. The ground improvement, in terms of shear strength increase for slope stability analysis, can be measured by the so-called Average Strength Parameters Method (Abramson et al., 2002). It is recommended that before the mass productions begins, the soil densification effect be tested on site by installing stone columns in a 30 x 30 ft^2 test area and conducting CPT soundings before and after the installation of stone columns to verify the improvement.

Three feet diameter stone columns can be placed at 8 ft spacing (center to center) with a triangular layout. The layer out of stone columns is presented in Appendix D. The stone columns may be terminated within the silty clay layer, at El. approx. -20 ft. This is for the benefit of ground water control, as penetrating through this clay layer can result in direct connection to the underlying sand layer, which could be a confined aquifer due to the confinement of the overlying clay layer. Stone columns penetrating into this dense sand layer could result in considerably larger volumes of water into the excavation. The stone columns can be cut off 2 ft below the lowest basement floor slab and sealed with lean concrete, for groundwater control purposes.

4.3.2 Lateral Spreading Mitigation: Soil-cement Mixed Gravity Walls

The lateral spreading may also be mitigated by constructing an in-situ soil-cement mixed gravity walls along the perimeter of the proposed structure. The soil-cement wall can be constructed by forming two rows of 5.5 ft diameter cylindrical soil-cement mixed columns. The uniaxial compression strength of the soil-cement can be taken as 50 to 75 psi. Our analysis (Table 3) indicates that the factor of safety can be increased to 1.36 and the lateral displacements can be controlled under 0.8 inches. In addition to the effect of mitigating lateral spreading, the soil-cement gravity wall also serves as a temporary support for excavation and a ground water barrier.

4.3.3 Pile Foundation: Auger Pressure Grouted Displacement Piles

Seventeen inch diameter Auger Pressure Grouted Displacement Piles (APGD) may be used to support the structural loads. The pile length is recommended to be 54 feet. The allowable vertical bearing capacity of single pile can be taken as 140 kips, with a factor of safety of 2 for side friction and 3 for end bearing. We recommend that piles be installed with minimum 3 diameters center-to-center spacing. For piles with 3 diameters center-to-center spacing, no reduction in axial capacity is required. Liquefaction downdrag is estimated to be 40 kips. The factor of safety with seismic down drag is about 1.75. The calculations are documented in Appendix E. Allowable uplift capacity of single piles, estimated from the allowable skin friction, can be taken as 30 kips. We estimate that the total settlement of proposed structures supported on APGD piles, under static and seismic loading, to be less than 1 inch. The lateral forces and maximum bending moment due to seismic loading are calculated using LPILE, assuming free-head pile with allowable pile head deflection of 1 inch, which is the case as indicated by lateral spreading analysis. Our analysis indicates that the seismic forces acting on the pile is about 8400 lbs, modeled as uniformly distributed force / in from pile head to 10.5 feet below. The maximum bending moment is 86 ft-kips. The design lateral capacity of single pile, under static conditions, can be taken as 15 kips for 1 inch allowable pile head deflection, for free head condition subjected to shear at pile head (Appendix E). This deflection is in addition to the 1" anticipated for seismic movement of the site.

It is recommended that pile loading tests being conducted on indicator piles to refine the allowable vertical bearing capacity.

The point of fixity can be determined by the formula recommended by Davisson and Robinson (1965):

$L_S = 1.8 \times \sqrt[5]{\frac{EI}{n_h}}$; Where EI is the flexural stiffness of the pile and n_k is the coefficient of subgrade modulus;

For the proposed 17 inch diameter APGD pile at the subject site, the point of fixity is 6.5 ft below finished grade.

4.3.4 Pile Foundation: Driven Concrete Piles

The proposed structure may also be supported on 14 inch wide driven concrete piles, provided that proper noise control makes this type of construction feasible. The IHC Model SC – 75 Hydraulic Hammer, with a maximum rated energy of 75 kNm (57,148 ft-kip), a ram weight of 5.7 tons, and a maximum weight of hammer with ram in air of 9.8 tons, may be used for pile driving. The hydraulic hammers are generally more efficient and quieter than the diesel hammers and operated at a nominal efficiency of 95 % or greater. The GDC's previous indicator pile testing indicated that the driving resistance for piles using the IHC hammer was generally similar to that using the Delmag D36-32 diesel hammer (GDC, 2004).

A layer of dense sand is present between El. – 25 to – 30 ft to the El. of -40 to -50 ft. The average CPT tip resistance is about 250 tsf. The average CPT sleeve friction is 2.2 tsf. This layer may be used as end bearing layer. However, this layer does not extend exclusively throughout the site or the layer thickness is too thin to support the vertical load, as indicated by CPT logs G-06, C-06, C-01, G-02. For these location, the piles need to be penetrated to El. -56 ft to mobilize sufficient side frictions. The same bearing capacities as that of the APGD piles may be used for driven concrete piles. We estimate that the total settlement of proposed structures supported on 14 inch square driven concrete piles, under static and seismic loading, to be less than 1 inch.

Prior to ordering the production piles, we recommend that at least ten indicator piles be driven at the subject site. Based on the results of the indicator piles, pile driving criteria for the production piles will be established by wave equation analysis (GRL-WEAP).

4.3.5 Structural Slab

Because liquefaction induced settlement will result in settlement beneath the lowest basement level floor slab, we recommend the lowest basement level floor be structurally supported on piles.

4.3.6 Basement Walls and Retaining Walls

4.3.6.1 Basement Walls

Permanent basement walls will be required around the building exterior. The perimeter of the building area will be supported by temporary shoring during excavation. The permanent basement walls will later replace the temporary shoring, which may be left in place or removed as required by the County.

Restrained walls such as basement walls should be designed for lateral pressures shown in Figure 6. For strip loading imposed by adjacent footings, the increment of lateral earth pressure should be evaluated on a case by case basis. Normal traffic loads can be modeled as 2 ft of soil surcharge or 240 psf vertical pressure. For rigid wall, lateral pressure coefficient will be 40% of 240 or a uniform pressure of 96 psf. This does not consider cranes or other heavy equipment.

We recommend that all retaining walls be backfilled with non-expansive granular soils (Plasticity Index less than 15). On-site clays should not be used for wall backfill. A 2-ft thick cap consisting of onsite clayey material should be used to minimize infiltration of surface water. The finish surface should be graded to drain away from the basement walls.

Heavy compaction equipment operating adjacent to retaining walls can cause excessively high lateral soil pressures to be exerted on the wall. Therefore, soils within 5 feet of the wall should either be compacted with hand operated equipment or designed to withstand compaction pressure from heavy equipment. All walls should be constructed with a properly designed drainage system to prevent buildup of hydrostatic pressures behind the wall or the wall should be designed for full hydrostatic pressure. Design water level for lateral pressure should be taken as El. + 5.0 feet. Basement walls or walls with architectural facades or coverings should be properly waterproofed to minimize moisture transmission through the walls. Typical wall backfill recommendations are shown in Figure 7.

4.3.6.2 Minor Retaining Walls

Minor retaining walls for hardscape around the building exterior (if used) may be supported near the finish grade on spread footings. Footings may be designed using an allowable bearing pressure of 1.5 ksf. The upper 12 inches of wall footing subgrade should be scarified, moisture conditioned as required, and compacted to a minimum of 90% relative compaction in accordance with ASTM D 1557-91.

Retaining wall footings on level ground should have a minimum embedment of 18-inches below finish grade. Retaining walls founded on a 2:1 slope should have a minimum embedment of 36-inches below finish grade above the slopeward edge of footing.

We recommend that retaining walls be backfilled with non-expansive granular soils with a PI less than 15 and percent passing No. 200 sieve of less than 15 percent. A 2-ft thick cap consisting of less pervious onsite materials should be used to minimize infiltration of surface water. The finish surface should be graded to drain away from the proposed structures. Heavy compaction equipment operating adjacent to retaining walls can cause excessively high lateral soil pressures to be exerted on the wall. Therefore, soils within 5 feet of the wall should either be compacted with hand operated equipment or designed to withstand compaction pressure from heavy equipment.

Cantilevered walls, which are free to move laterally at least ½ in. for each 10-ft height, may be designed for an equivalent fluid pressure of 38 pcf (with level backfill) or 45 pcf (2:1 sloping backfill). Walls restrained at the top with level backfill should be designed for an equivalent fluid pressure of 55 pcf.

4.3.7 Miscellaneous at-grade structures

Minor non-habitable structures at-grade may be supported on spread footings. Footings may be designed using an allowable bearing pressure of 1.0 ksf. The upper 24 inches of the footing subgrade should be removed, moisture conditioned as required, and compacted to a minimum of 95% relative compaction in accordance with ASTM D 1557-91, and the grading section of our report.

Due to the non-uniform deposition characteristics of the hydraulic fill, to avoid damage caused by different settlement, the proposed "big bathroom" may be supported on pile foundation, tipped at El. -35 ft.

4.3.8 Temporary Excavations

General

The excavation for removals under buildings and pavements will generally extend to a depth up to 12 feet (EL. +0.0). Temporary excavations should be readily accomplished by conventional heavy excavation equipment such as scrapers, loaders, dozers and excavators. Because the groundwater varies between EL. -1.0 to El. +5.0, proper dewatering or ground water cut off should be considered for excavation.

Surcharge loads, such as vehicular traffic, heavy construction equipment, and stockpiled materials, should be kept away from the top of temporary excavations a horizontal distance at least equal to the depth of excavation. Surface drainage should be controlled and prevented from running down the slope face, and ponding water should not be allowed within the excavation. Construction equipment and foot traffic should be kept off excavation slopes to minimize sloughing. Even with the implementation of the above recommendations, some sloughing of slopes and unstable soil zones may still occur within temporary excavations, and workmen should be adequately protected.

All excavation slopes and shoring systems should meet the minimum requirements of the Occupational Safety and Health (OSHA) Standards. Maintaining safe and stable slopes on excavations is the responsibility of the Contractor and will depend on the nature of the soils and groundwater conditions encountered and his method of excavation. Excavations during construction should be carried out in such a manner that failure or ground movement will not occur. The Contractor should perform any additional studies deemed necessary to supplement the information contained in this report for the purpose of planning and executing his excavation plan.

Shored Excavations

The maximum proposed excavation is about 12 feet deep. An open excavation with 1 vertical to 1.5 horizontal slope may be adopted. The ground water elevation that most likely to occur is El. +4 ft, as that was the highest water level recorded during a month. Proper dewatering system will be required to lower the water table at least 2 feet below the bottom of the excavation.

We recommend that sheet piles to be used as a mean of temporary shoring and ground water cut-off, the length of the sheet piles should be not less than 20 feet. This is based on an open excavation to El. +5 ft. The maximum deflection for such sheet piles is expected to be less than 1 inch. The amount of water entering the excavation is expected to be small and can likely be handled by pumping from sump pumps.

If solider piles and lagging is to be used, the slope may be open excavated to a depth of 7 ft at 1:1.25 (V:H), which is about 1.5 ft above the water level. The resulting shoring depth is 5 ft. An equivalent fluid pressure of 50 pcf, resulted from active earth pressure may be used. The hydrostatic water pressure should also be considered in shoring calculation.

Soldier piles may consist of steel H-beams placed inside a drilled and cast-in-place concrete pile. Structural concrete should be used below the bottom of excavation and lean concrete above, so the concrete can be chipped out to place the lagging. Piles should be 2 feet in diameter and installed on about 8-foot centers. Lagging will be required to support/retain any sandy and unstable soils. Proper dewatering system will be required to lower the water table at least 2 feet below the bottom of the excavation.

Where shoring supports adjacent structures, the deflection of the top of shoring shall be limited to ¼ inches at any time during any construction stage or final shoring configuration.

The calculations for temporary shoring are presented in Appendix F.

Monitoring Of Shoring

To guard against damage claims, a survey-monitoring program should be implemented to measure shoring displacements during construction. Group Delta Consultants, Inc. should review the shoring displacement data to verify that the vertical and lateral movements are within tolerable limits. In addition, a condition survey of the adjacent buildings should be performed. Existing foundations within 10 ft of the top of the shoring may move laterally and settle up to ½ inch and may cause some distress in the existing foundations / slabs. The need to underpin the buildings or accept minor damage to miscellaneous buildings should be evaluated based on the economics of providing underpinning and repairing minor damage due to settlement.

4.3.9 Constructibility

In general, temporary shoring should be used for construction excavations. Excavations that extend below an imaginary plane inclined at 45 degrees below the edge of any existing site foundations or utilities shall be properly shored to maintain support of the adjacent structures. The Contractor shall be responsible for the design of the shoring and dewatering (if necessary). All excavation and shoring systems shall meet the minimum requirements of the Occupational Safety and Health (OSHA) standards. In general, conventional soil-excavation equipment such as loaders, dozers or excavators may be used for excavations.

The ground water elevation that most likely to occur duration excavation is about El. +4 ft. As the bottom of the excavation is about El. + 0.0 ft, up to 4 ft of the excavation will be below the ground water level. If sheet pile or soil- cement mixed wall are to be used, only limited ground water is expected to infiltrate into the excavation. If open excavation or solider piles and lagging are to be adopted, Proper dewatering system will be required to lower the water table at least 2 feet below the bottom of the excavation.

A layer of geogrid and 12 to 18 inches of properly compacted gravel base should be placed at the bottom of the excavation to provide a working base for construction and to facilitate construction.

For ground water control purpose, it is recommended that the top of the stone column to be sealed by concrete plug.

4.4 Soil Corrosivity

The Soil Corrosivity test was performed by Bagahi Engineering (Bagahi, 2005). Four samples from different depths were tested. The results indicate that the test sample had a water-soluble sulfate content of as high as 4,126 ppm, and a soluble chloride content of 252 ppm to 15683 ppm. The sulfate results indicate that the sulfate exposure is severe. According to the UBC- Uniform Building Code, Table 19A-A-4, Type V cement and a water-cement ratio of 0.45 should be used for design of concrete in contact with near-surface native materials.

4.5 Expansion Potential

The near surface soil at the subject site is predominantly granular hydraulic fill and has low expansion potential. Expansion test should be performed for any imported fill. Also, at the completion of grading, if silty subgrade soils are encountered, expansion index test should be performed to verify expansion potential.

4.6 Pavement Design and Concrete Flatwork

Bagahi Engineering (2005) performed "R"- value test on a sample from near surface soils. The R-value determined from their test was 65. Considering the non-uniformity of the near surface fill, a lower R-value of 40 may be used in design. For traffic index of 5.5 and a subgrade R-value of 40, the asphalt concrete pavement may be designed as 3 inches AC surface over 6 inches of aggregate base. The upper 24-inches of subgrade supporting pavements should be compacted to at least 95 percent relative compaction (ASTM D1557-1990). For PCC pavements in areas of some truck traffic, we recommend a pavement section of 6 in PCC over 12 inch of aggregate base.

Concrete Flatwork should be supported on 24 inches properly placed compacted fill, moisture conditioned to between 0 to 2 percent wet of the optimum moisture content, and compacted to at least 90 percent relative compaction as determined by ASTM D1557-91.

To reduce the potential for cracking, the concrete Flatwork such as side walks, should have a minimum thickness of 4 inches with weakened plan joints at intervals of less than 5 feet in both directions. Reinforced slab may be considered as determined by the structural engineer.

4.7 Demolition

Prior to the start of grading, demolition will be required to remove the existing improvements, including buildings, slabs, foundations, basements, retaining walls, fences and pavements. It is not known to what extent basements and other buried structures and/or tanks or septic systems may be present. It should also be anticipated that the buried remnants of other historic construction could also be encountered anywhere on the site.

Any soils loosened or disturbed during the demolition should be removed to the limits determined by the project Geotechnical Engineer. Any void created from the demolition should be properly backfilled as described in Section 4.9 of this project.

The Civil Engineer should identify the presence and location of all existing utilities on the property. Precautions should be taken to remove, relocate or protect existing utilities, as appropriate.

4.8 Removals

The buildings are proposed to be supported on piles and the floor slab will be a structural slab. Up to 12 feet of hydraulic fill was encountered in this exploration. It should be anticipated that the presence of fill could be extensive and locally deeper. Any old fill should be considered to be uncertified and should not be used for support of the planned structures, walls, or pavements. Therefore, any existing fill must be removed and replaced with properly compacted fill.

4.9 Earthwork

All grading should conform to the requirements of the County of Los Angeles Grading Division and the general grading recommendations outlined below.

1. The grading contractor is responsible for notifying the project Geotechnical Engineer of a pre-grading meeting prior to the start of grading operations and anytime that the operations are resumed after an interruption.

2. Prior to the start of earthwork the existing improvements will require demolition, as discussed in Section 4.4. Existing utilities should be removed, relocated or protected, as appropriate.

3. The bottoms of completed excavations should be observed by the project Geotechnical Engineer, while it is proof-rolled with loaded equipment. Any loose or yielding soils should be over-excavated and recompacted to the limits determined by the project Geotechnical Engineer.

4. Basement walls should be backfilled with non-expansive granular soils with a Plastic Index (PI) of less than 15 and with less than 15 percent fines (clay/silt) passing the No. 200 sieve, and compacted to at least 95 percent of the maximum dry density determined by ASTM D 1557-91. In addition, a drainage system should also be provided behind the walls, which may require the use of pervious backfill material.

5. All earthwork and grading should be performed under the observation of the project Geotechnical Engineer. Compaction testing of the fill soils shall be performed at the discretion of the project Geotechnical Engineer. Testing should be performed for approximately every 2 feet in fill thickness or 500 cubic yards of fill placed, whichever occurs first. If specified compaction is not achieved, additional compactive effort, moisture conditioning, and/or removal and recompaction of the fill soils will be required.

6. All materials used for asphalt concrete and base shall conform to the 2000 "Green Book" or the equivalent, and shall be compacted to at least 95 percent relative compaction.

7. If, in the opinion of the Geotechnical Engineer, Contractor, or Owner, an unsafe condition is created or encountered during grading, all work in the area shall be stopped until measures can be taken to mitigate the unsafe condition. An unsafe condition shall be considered any condition that creates a danger to workers, on-site structures, on-site construction, or any off-site properties or persons.

5.0 POST INVESTIGATION SERVICES

We recommend that final project plans and specifications should be reviewed by GDC to confirm that the full intent of the recommendations presented in this report have been properly applied to the design. During construction, all earthwork should be observed and tested by GDC, including site preparation, excavations, placement of compacted fill and backfill, and installation of drainage systems.

6.0 LIMITATIONS

This investigation was performed in accordance with generally accepted geotechnical engineering principles and practice. The professional engineering work and judgments presented in this report meet the standard of care of our profession at this time. No other warranty, expressed or implied, is made. This report has been prepared for the Olson Company, and their design consultants. It may not contain sufficient information for other parties or other purposes, and should not be used for other projects or other purposes without review and approval by GDC.

The recommendations for this project, to a high degree, are dependent upon proper quality control of site grading, fill and backfill placement, and pile / stone column foundation installation. The recommendations are made contingent on the opportunity for GDC to observe the earthwork operations. This firm should be notified of any pertinent changes in the project, or if conditions are encountered in the field, which differ from those described herein. If parties other than GDC are engaged to provide such services, they must be notified that they will be required to assume complete responsibility for the geotechnical phase of the project, and must either concur with the recommendations in this report or provide alternate recommendations.

7.0 REFERENCES

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Recommended Procedures for Implementation of DMG Special Publication 117: Guidelines for Analyzing and Mitigating Liquefaction in California, Southern California Earthquake Center, 1999.

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Tokimatsu, Kohji, and Seed, H.B., " Evaluation of Settlements in Sands Due to Earthquake Shaking," Journal of Geotechnical Engineering, Vol. 113, No. 8, Proc. Paper No. 21706, August 1987.

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Table 1: Summary of Previous Laboratory Testing Results

Boring No.	Depth (ft)	Direct Shear		Consolidation		Fc (%)	Liquid Limit	Soil Type
		c (psf)	∅ (°)	C_r / 1+e_0	C_c / 1+e_0			
L-1	10					8		
	15	552	28					SP
	38					18		
L-2A	15					36		
	20					5		
	30			0.029	0.055			
	35					18		
L-3	5					4		
	15					7		
B-1	20			0.02	0.05			SM
	35						17	ML
B-2	30	150	22	0.043	0.116			SC
B-3	20	75	29	0.011	0.023			SC
	35					2		
B-4	25						56	ML
	30	100	19	0.025	0.116			ML
B-5	20			0.011	0.043			SM
B-6	30	270	15	0.033	0.075			SM
	35						22	

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Table 2: Summary of Liquefiable Soil Layers and Liquefaction Induced Settlements

CPT No.	Liquefiable Layer 1				Liquefiable Layer 2				Liquefiable Layer 3				Liquefiable Layer 4				Liquefiable Layer 5				Total
	Top Elv.	Bott.	Thck	Settl	Top Elv.	Bott.	Thck	Settl	Top Elv.	Bott.	Thck	Settl	Top Elv.	Bott.	Thck	Settl	Top Elv.	Bott.	Thck	Settl	Settl.
	(ft)	Elv. (ft)	(ft)	(in)	(ft)	Elv. (ft)	(ft)	(in)	(ft)	Elv. (ft)	(ft)	(in)	(ft)	Elv. (ft)	(ft)	(in)	(ft)	Elv. (ft)	(ft)	(in)	(in)
G-01	4.5	1.5	3	0.328	-3.5	-11.5	8	1.34					-19.5	-22.5	3	0.59	-42.5	-43.5	1	0.139	2.78
C-08					-6.2	-10.2	4	0.763									-40.7	-43.7	3	0.49	1.87
G-02									-8	-11	3	0.448					-36	-38	2	0.265	1.43
C-07					-2.7	-12.6	9.9	2.139					-23.4	-27.3	3.9	1.195					3.47
G-03	4	2	2	0.271	-2	-11	9	1.419	-21	-24	3	0.458	-31	-35	4	0.673					3.21
C-01	-5.8	-9.7	3.9	0.674	-15.6	-17.6	2	0.29	-22.5	-24.5	2	0.315	-28.4	-32.3	3.9	0.553	-39.2	-41.2	2	0.23	2.35
C-09					-5.8	-11.7	5.9	0.763													1.68
C-04					-5.8	-15.6	9.8	1.618	-22.5	-25.4	2.9	0.475									2.26
G-06	5	2	3	0.086	-2	-9	7	0.863					-32	-34	2	0.309					1.51
G-04					-8	-11	3	0.448					-36	-38	2	0.265					1.43
G-05					-6.5	-17.5	11	1.558					-28	-30	2	0.28					2.45
C-02					-12.2	-17.1	4.9	0.584													1.15
C-03					-3.2	-16.1	12.9	1.84													1.88
C-05					-3.7	-11.7	8	1.218	-17.6	-19.5	1.9	0.37									1.73
C-06	1.3	-0.7	2	0.153	-4.7	-12.6	7.9	1.37	-18.5	-20.5	1.97	0.35	-29.3	-34.3	5	0.771					2.89
Min.					-12.2	-17.6	2	0.29													1.15
Max.					-2	-9	12.9	2.139													3.47
Avg.					-4.7	-13.23	7.379	1.158													2.13933

Table 3: Lateral Spreading Analysis Result

Cross-Section C-C'				
Method of Mitigation	Factor of Safety		Displacement (in)	
	Before Treatment	After Treatment	Before Treatment	After Treatment
11' Soil -cement Mixed Wall		1.47		0.4
8 Rows Stone Column	1.02	1.29	3.8	0.9
Cross-Section G-G'				
Method of Mitigation	Factor of Safety		Displacement (in)	
	Before Treatment	After Treatment	Before Treatment	After Treatment
11' Soil -cement Mixed Wall		1.36		0.8
8 Rows Stone Column	1.01	1.26	3.8	1.1

Note: Considering the pile effect will reduce the lateral displacement to less than 1 inch

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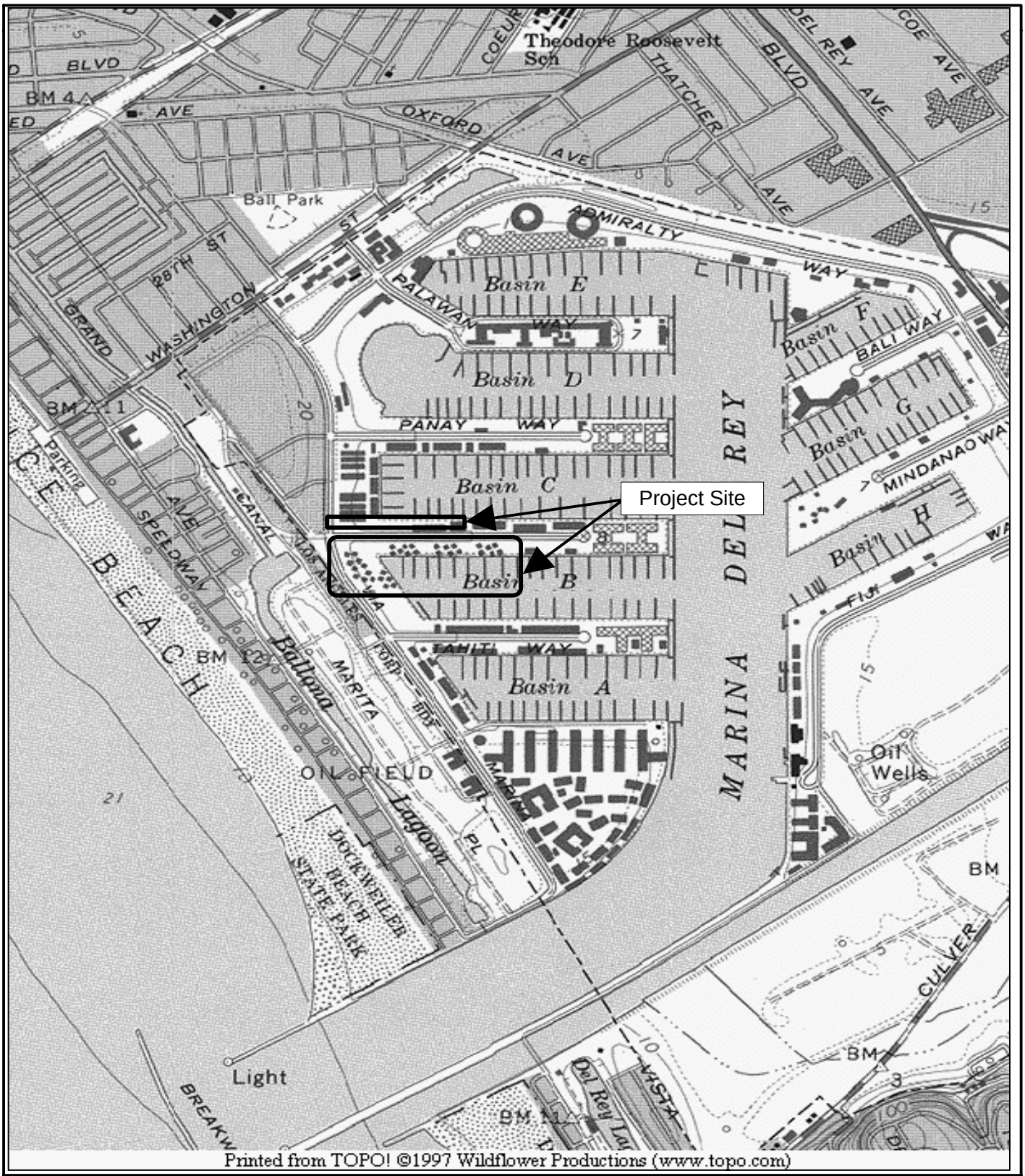
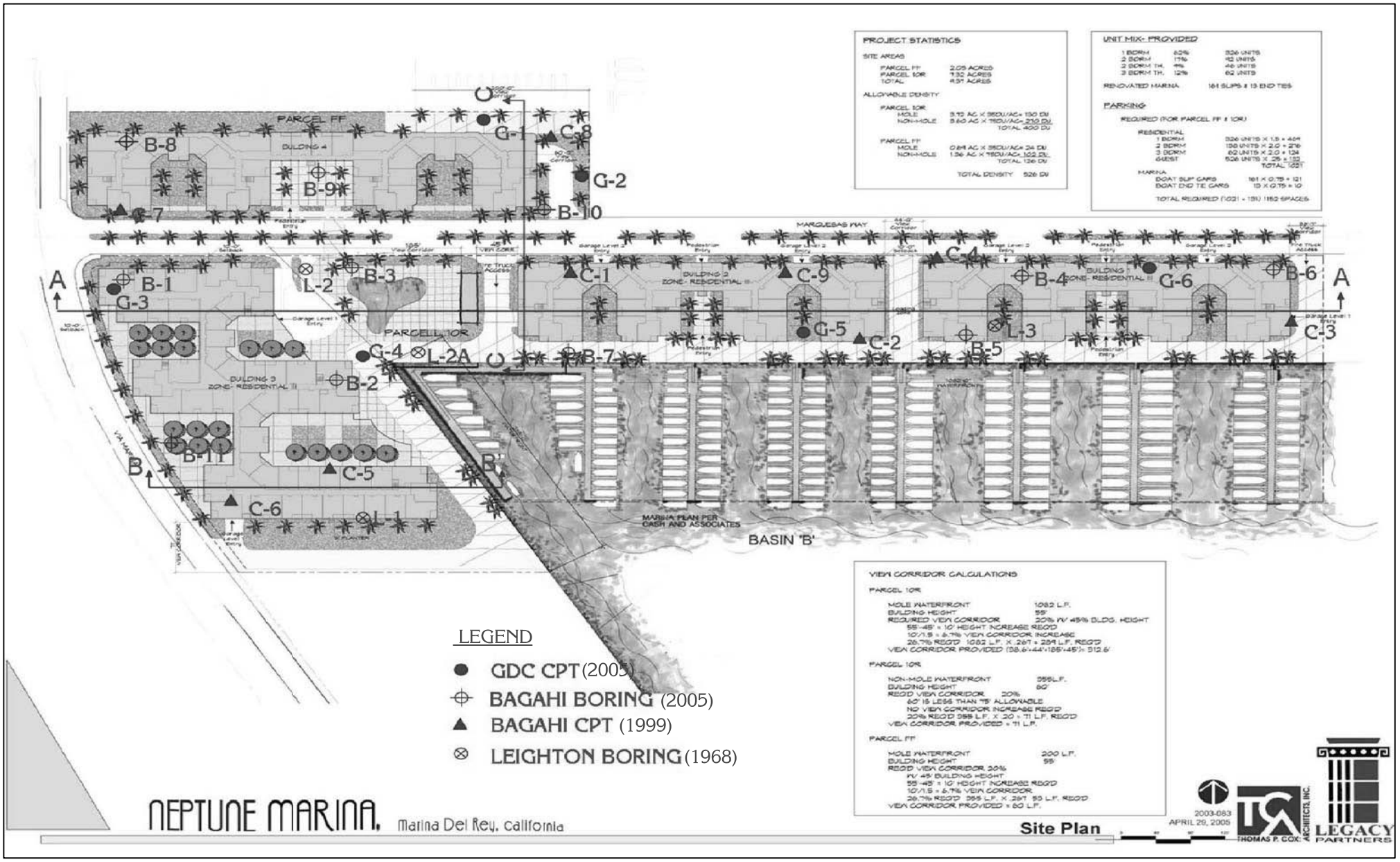


VICINITY MAP

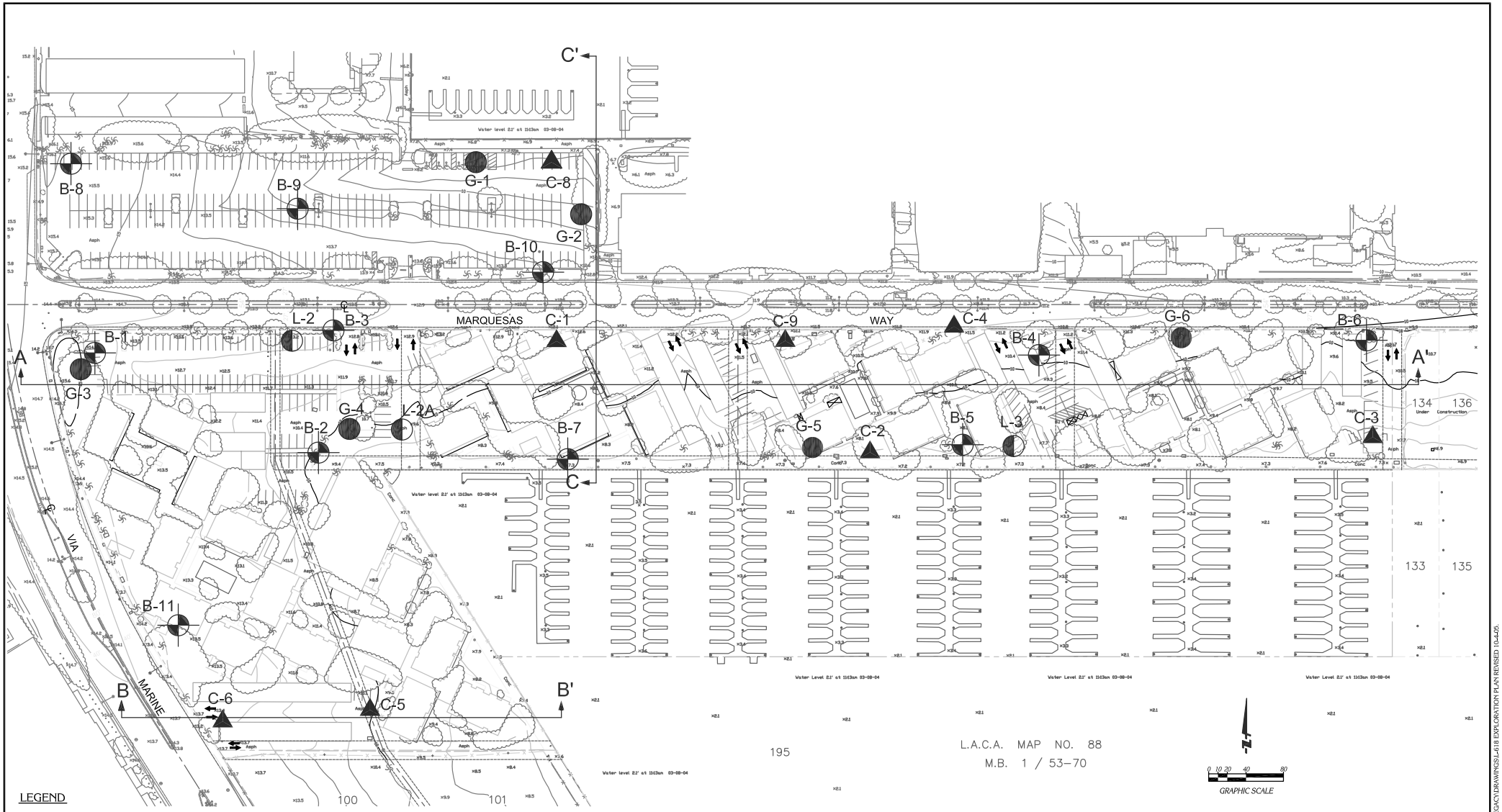
Group Delta Consultants, Inc.

Project Number: L-618
Project Name: Neptune Marina
Date: 08/03/2005

Figure 1



DATE: 08/17/05	DRAWN BY: T Ybarra		GROUP DELTA CONSULTANTS, INC. 2291 W. 205th Street Suite 105 Torrance, CA.90501	Conceptual Exploration Plan Legacy Partners - Neptune Marina Marina Del Rey, California	PROJECT NUMBER: L-618
REVISED: 10/11/05	APPROVED BY: M Reader				SCALE: As Shown
REVISED:					FIGURE NUMBER: 2



LEGEND

- GDC CPT (2005)
- BAGAHI BORING (2005)
- BAGAHI CPT (1999)
- LEIGHTON BORING (1968)

Reference: Drawing prepared by, Fusco Engineering, titled, " Improvement Plat ALTA/ACSM Title Survey, Sheet 2 of 2, dated 3-31-04

DATE: 5-13-05	DRAWN BY: T. Ybarra	GROUP DELTA CONSULTANTS, INC 2291 W. 205th Street Suite 105 Torrance, CA. 90501	EXPLORATION PLAN
REVISION:	APPROVED BY: M. Reader		Legacy Parnters Residental - Neptune Marina Apts. Marina Del Rey, CA
REVISION:			

PROJECT NUMBER: L-618
SCALE: AS SHOWN
FIGURE NUMBER: 2A

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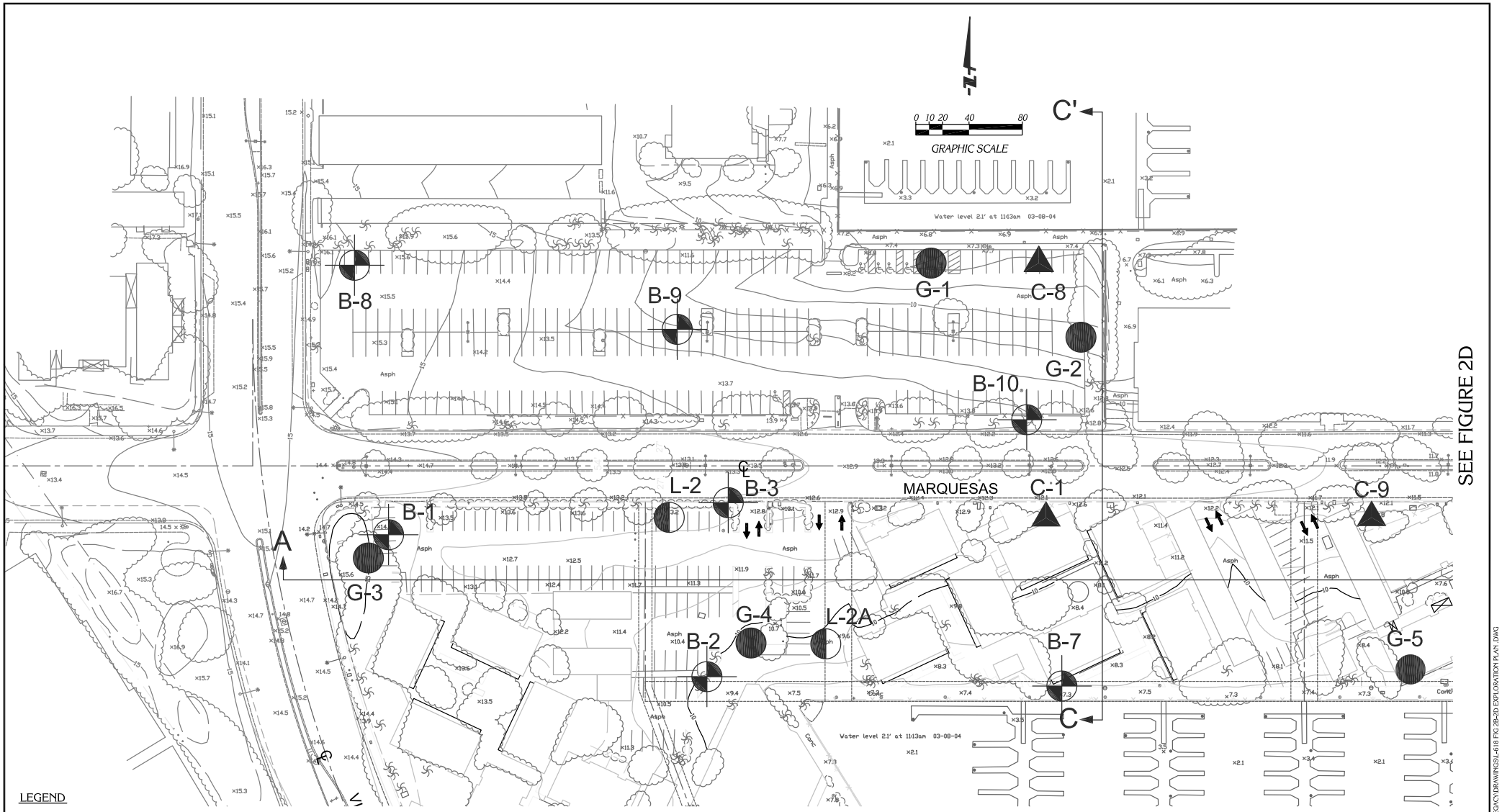


LEGEND

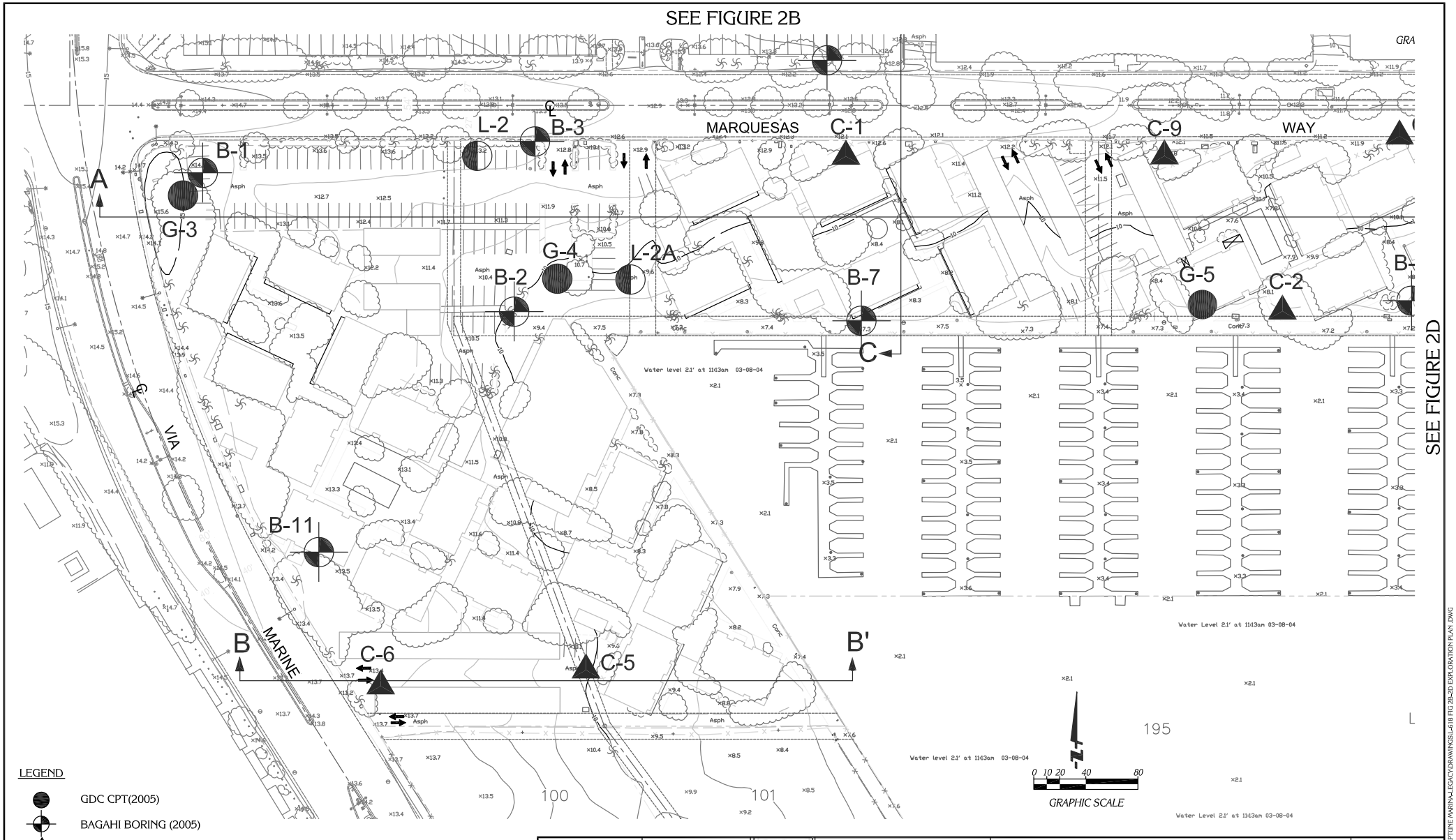
- GDC CPT(2005)
- BAGAHI BORING (2005)
- BAGAHI CPT (1999)
- LEIGHTON BORING (1968)

Reference: Drawing prepared by, Fusco Engineering, titled, " Improvement Plat ALTA/ACSM Title Survey, Sheet 2 of 2, dated 3-31-04

DATE: 5-13-05	DRAWN BY: T. Ybarra	GROUP DELTA CONSULTANTS, INC 2291 W. 205th Street Suite 105 Torrance, CA. 90501	EXPLORATION PLAN
REVISION:	APPROVED BY: M. Reader		Legacy Parnters Residental - Neptune Marina Apts. Marina Del Rey, CA
REVISION:			

PROJECT NUMBER: L-618
SCALE: AS SHOWN
FIGURE NUMBER: 2B

N:\PROJECTS\600-699\L-618 NEPTUNE MARINA-LEGACY\DRAWINGS\L-618 FIG 2B-2D EXPLORATION PLAN .DWG



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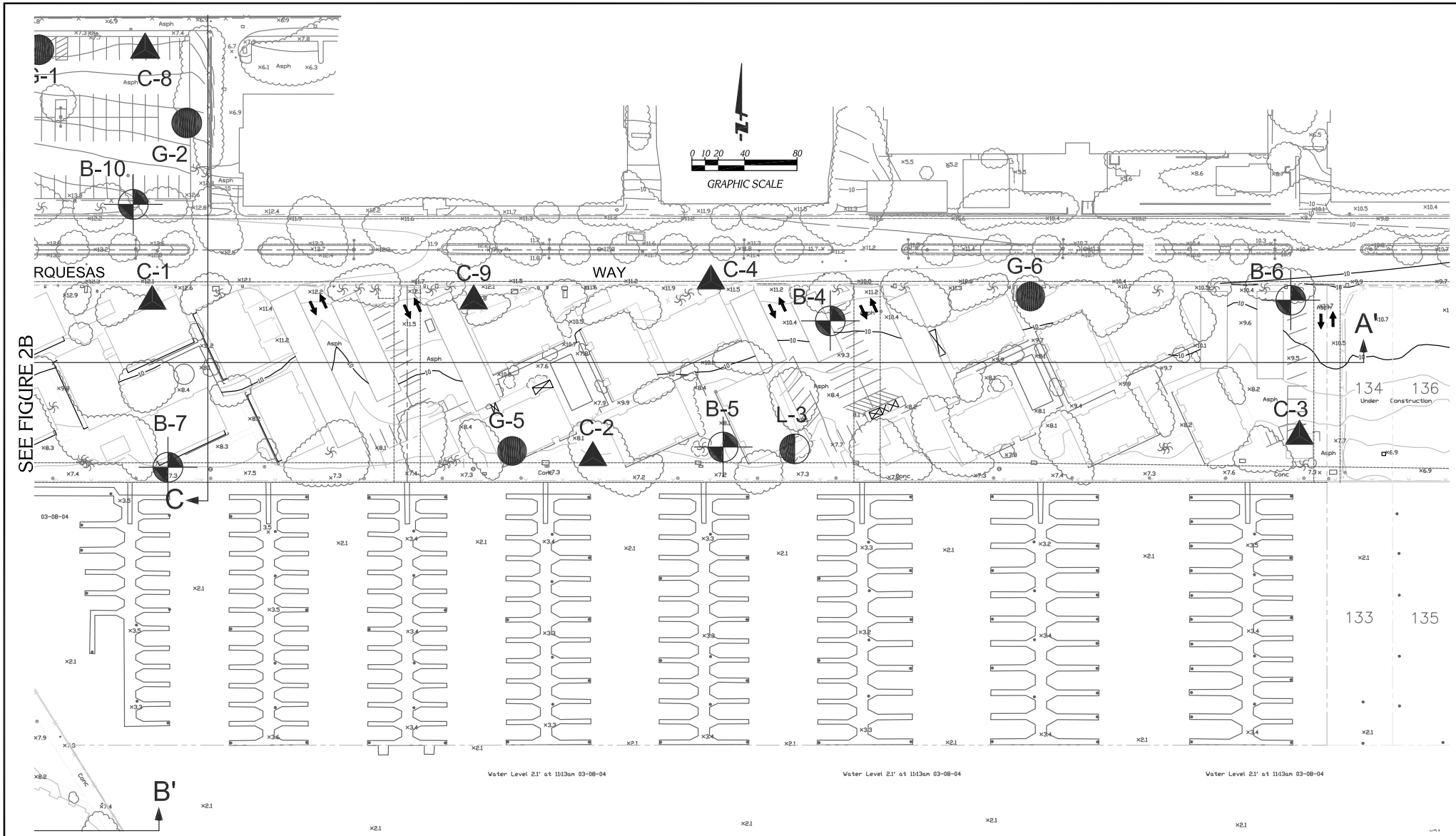
- GDC CPT(2005)
- BAGAHI BORING (2005)
- BAGAHI CPT (1999)
- LEIGHTON BORING (1968)

Reference: Drawing prepared by, Fusco Engineering, titled, " Improvement Plat ALTA/ACSM Title Survery, Sheet 2 of 2, dated 3-31-04

DATE: 5-13-05	DRAWN BY: T. Ybarra	GROUP DELTA CONSULTANTS, INC 2291 W. 205th Street Suite 105 Torrance, CA. 90501	EXPLORATION PLAN	PROJECT NUMBER: L-618
REVISION:	APPROVED BY: M. Reader		Legacy Parnters Residental - Neptune Marina Apts. Marina Del Rey, CA	SCALE: AS SHOWN
REVISION:				FIGURE NUMBER: 2C

N:\PROJECTS\600\-699\L-618 NEPTUNE MARINA-LEGACY\DRAWINGS\L-618 FIG 2B-2D EXPLORATION PLAN .DWG



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- GDC CPT(2005)
- BAGAHI BORING (2005)
- BAGAHI CPT (1999)
- LEIGHTON BORING (1968)

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DATE: 5-13-05	DRAWN BY: T. Ybarra	GROUP DELTA CONSULTANTS, INC 2291 W. 205th Street Suite 105 Torrance, CA. 90501	EXPLORATION PLAN
REVISION:	APPROVED BY: M. Reader		Legacy Parnters Residental - Neptune Marina Apts. Marina Del Rey, CA
REVISION:			

PROJECT NUMBER: L-618
SCALE: AS SHOWN
FIGURE NUMBER: 2D

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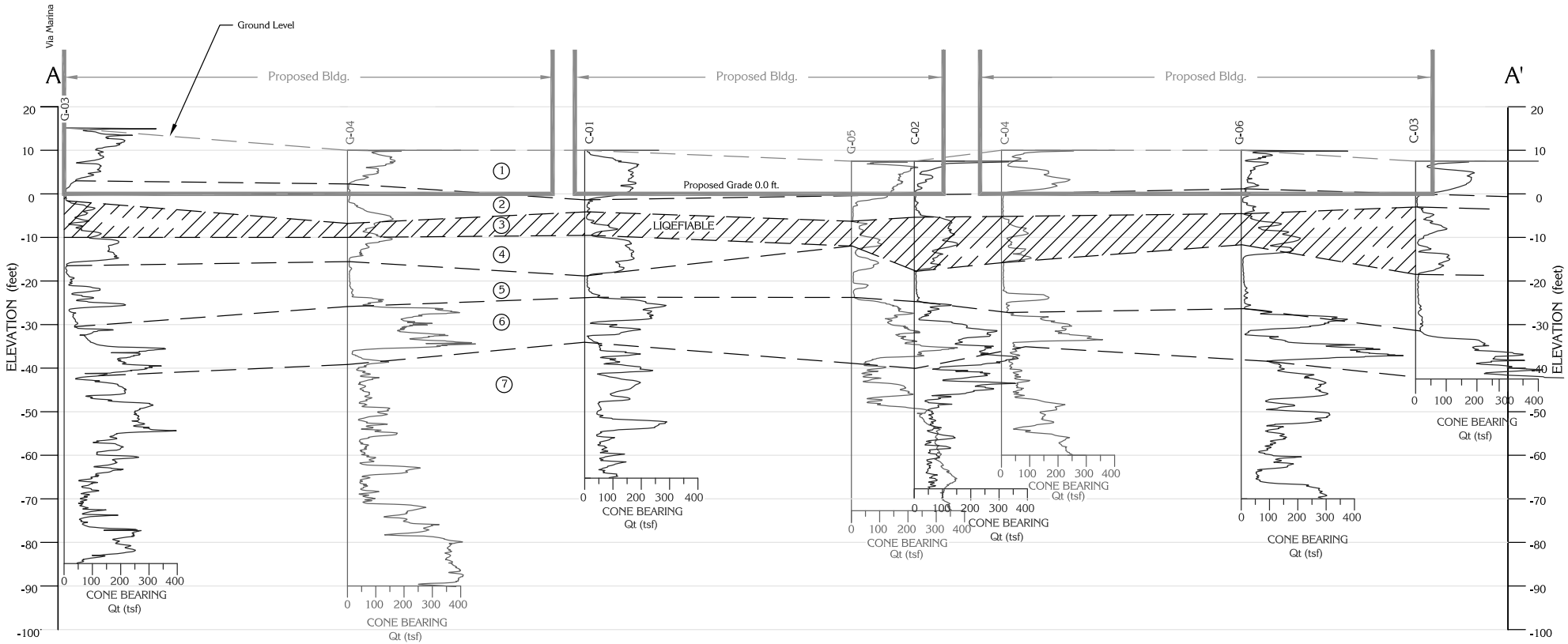

LEGEND

1. Fill & Hydraulic Fill (SP)
2. Native: Clayey Silt & Silty Clay (ML/CL)
3. Silty Sand & Sandy Silty (SM)
4. Sand (SP)
5. Silty Clay & Clayey Silt (CL/ML)
6. Sand (SP)
7. Sand, Silty Sand & Sandy Silt (SP/SM)

Cross Section A-A

Legacy Partners - Neptune Marina
Marina Del Rey, California

Group Delta Consultants, Inc.

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Torrance, CA
Phone: (310) 320-5100
Fax: (310) 320-2118

Drawn By:	T Ybarra
Approved By:	M Reader
Date:	7/1/05
Revised:	
Scale:	V: 1" = 25' H: 1" = 15'
Project Number:	L-618
Figure Number:	3

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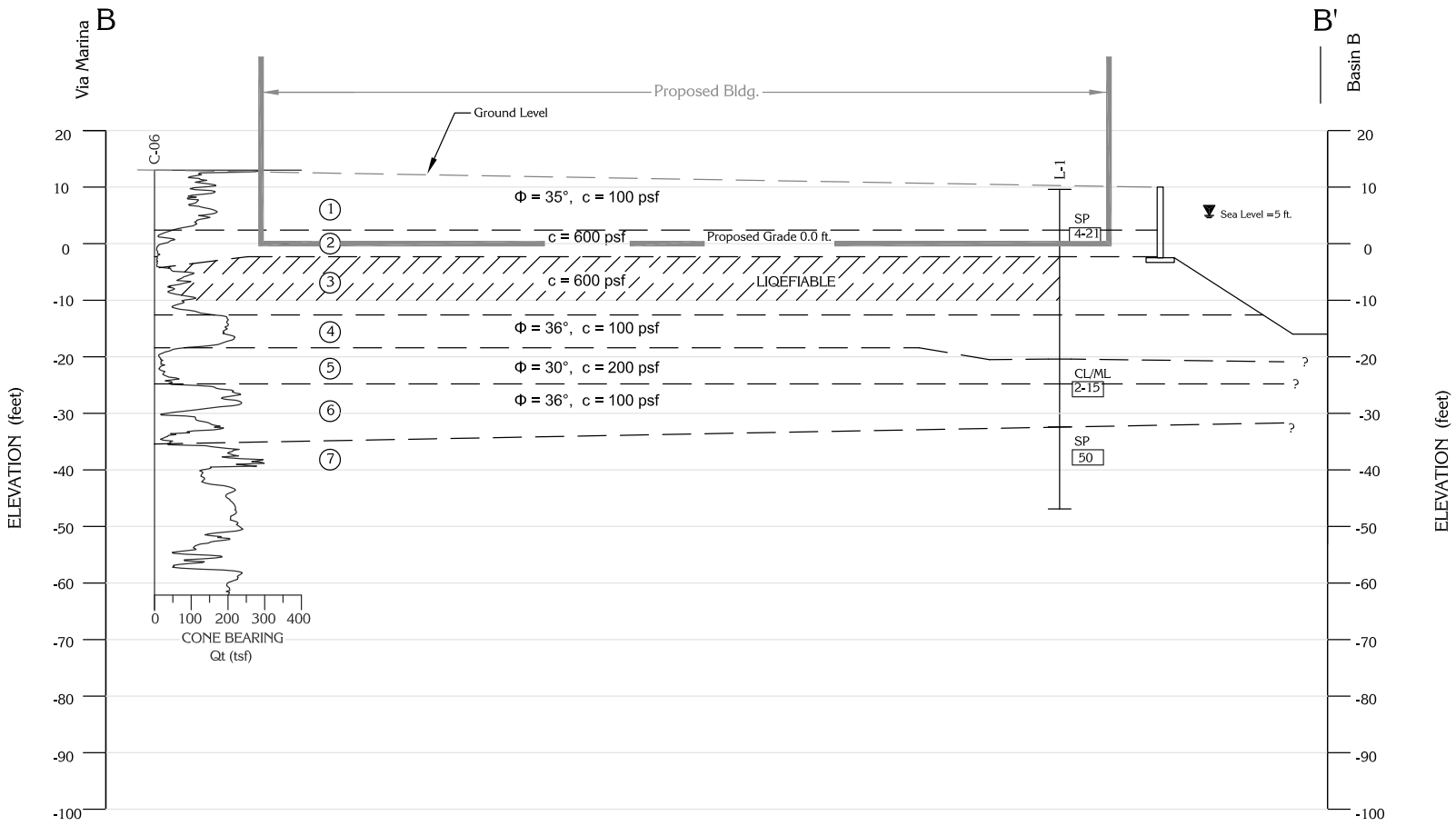

LEGEND

1. Fill & Hydraulic Fill (SP)
2. Native: Clayey Silt & Silty Clay (ML/CL)
3. Silty Sand & Sandy Silty (SM)
4. Sand (SP)
5. Silty Clay & Clayey Silt (CL/ML)
6. Sand (SP)
7. Sand, Silty Sand & Sandy Silt (SP/SM)

Cross Section B-B

Legacy Partners - Neptune Marina
Marina Del Rey, California

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Drawn By:	T Ybarra
Approved By:	M Reader
Date:	7/1/05
Revised:	
Scale:	V: 1" = 20' H: 1" = 20'
Project Number:	L-618
Figure Number:	4

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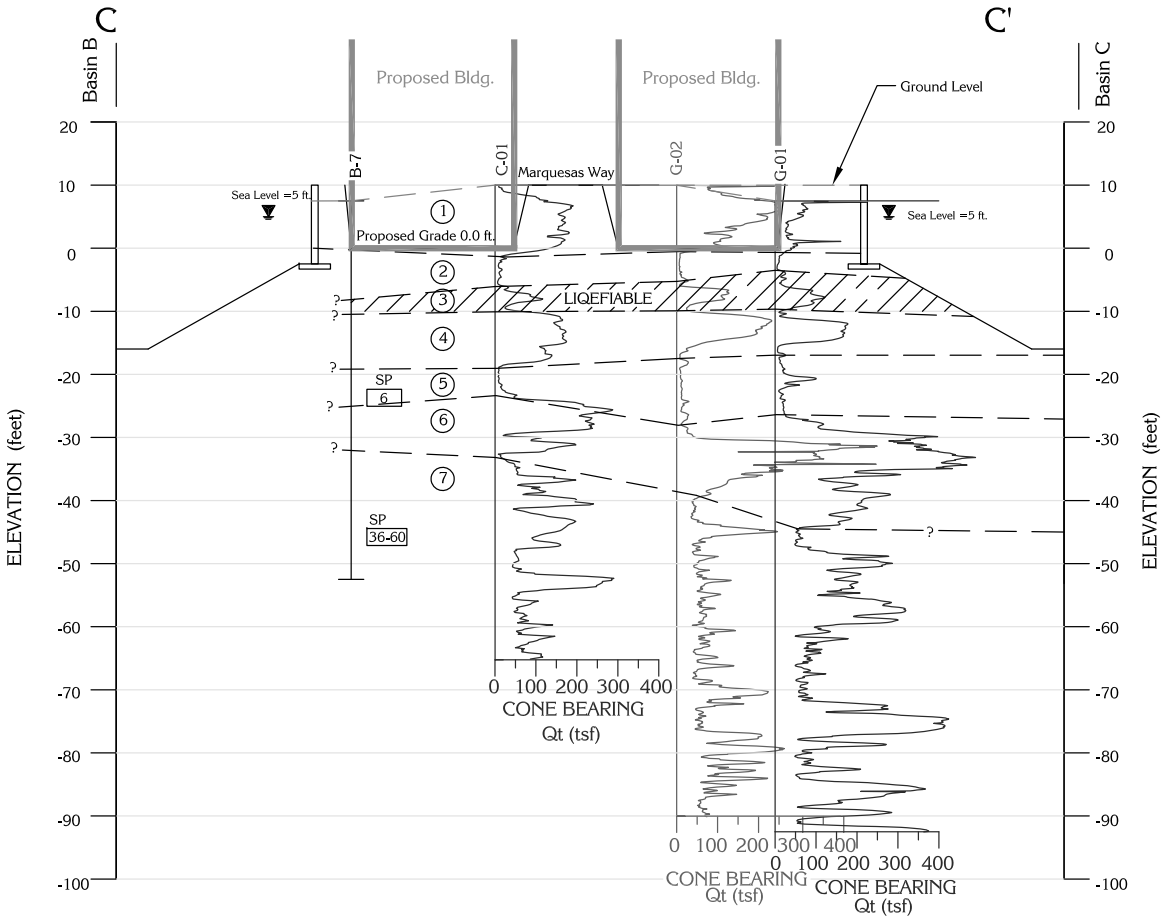

LEGEND

1. Fill & Hydraulic Fill (SP)
2. Native: Clayey Silt & Silty Clay (ML/CL)
3. Silty Sand & Sandy Silty (SM)
4. Sand (SP)
5. Silty Clay & Clayey Silt (CL/ML)
6. Sand (SP)
7. Sand, Silty Sand & Sandy Silt (SP/SM)

Cross Section C-C

Legacy Partners - Neptune Marina
Marina Del Rey, California

Group Delta Consultants, Inc.

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Drawn By:	T Ybarra
Approved By:	M Reader
Date:	7/1/05
Revised:	
Scale:	V: 1" = 20' H: 1" = 10'
Project Number:	L-618
Figure Number:	5

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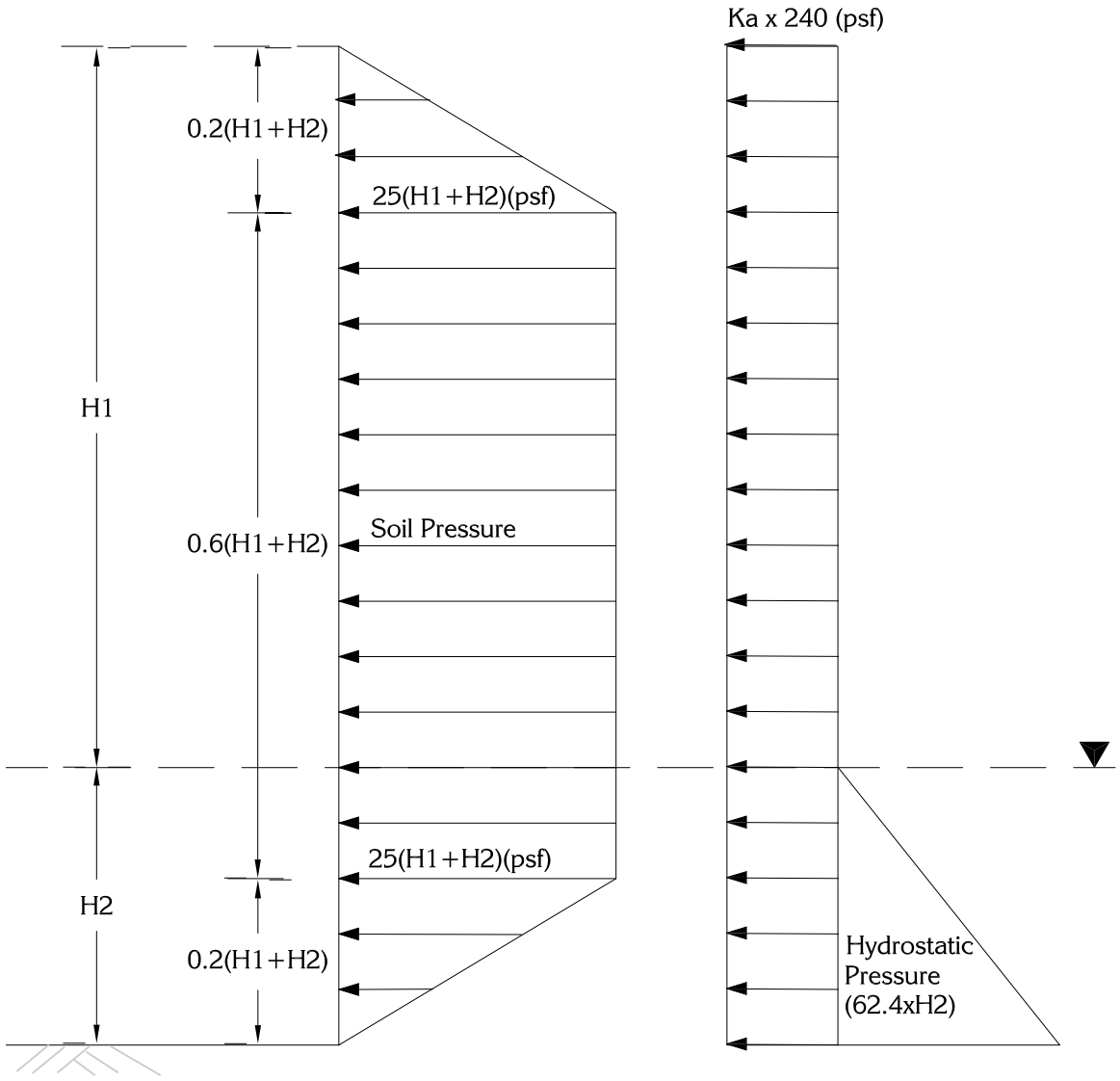


Soil Pressure

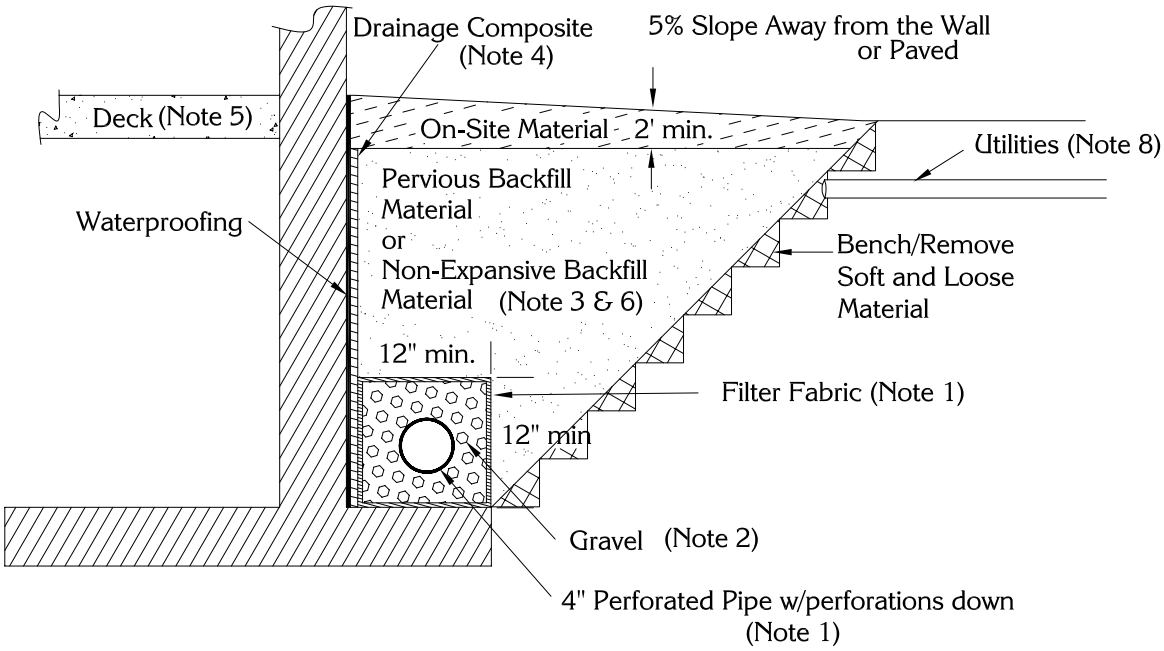
Traffic Surcharge

NOTES

1. THESE PRESSURE ARE APPLICABLE FOR RIGID BASEMENT WALL OR BRACED SHORING

2. SURCHARGE PRESSURE IS BASED ON 2 FT. OF SOIL LOAD. SURCHARGE FOR BUILDINGS OR OTHER EQUIPMENT SHOULD BE EVALUATED ON A CASE-BY-CASE BASIS.

LATERAL PRESSURE FOR BASEMENT WALL			
Neptune Marina Apts Marina Del Rey, CA		PROJECT NUMBER:	L-618
		DATE:	09/02/05
SCALE: Not To Scale	DRAWN BY: Y. LIU	REVISED:	
	APPROVED BY: M Reader	FIGURE:	6
GROUP DELTA CONSULTANTS, INC.			



NOTES

1) Perforated pipe should be an ASTM standard Acrylonitrile Butadiene Styrene (ABS), Polyvinyl Chloride (PVC), or Polyethylene (PE) with a 0.25% slope for drainage and wrapped with a filter fabric (Mirafi 140 or equivalent).

2) Gravel - 3/8" or 3/4" gravel

3) If no drainage composite is used, Pervious Backfill material should be used above the gravel zone. Pervious Material should be meet Public Works Standard (Greenbook 2000, 3.0.0-3.5.2) as follows:

100% passing 3/4"
80-100% passing 3/8"
0-8% passing -100 sieve
0-3% passing -200 sieve

4) If a drainage composite is used, non expansive backfill material may be used above the gravel zone. Drainage Composite Material should be MiraDrain 6000 material or equivalent. Backfill should have an EI<30 and conform to Group Delta Grading and Backfill Recommendations.

5) If the wall is supported by the deck, no backfill shall be placed before the deck is constructed and a structural engineer's approval is given.

6) No heavy equipment or compaction equipment should be used above the perforated pipe, or within 8 feet of the wall. Only hand compaction equipment should be used above adjacent to the walls.

7) Pipe shall be designed and within specifications to the attached City of Los Angeles memo dated 05/20/96.

8) Utility Laterals - Remove loose material and hand compact backfill or use 2-sack sand/cement slurry.

BASEMENT WALL BACKFILL

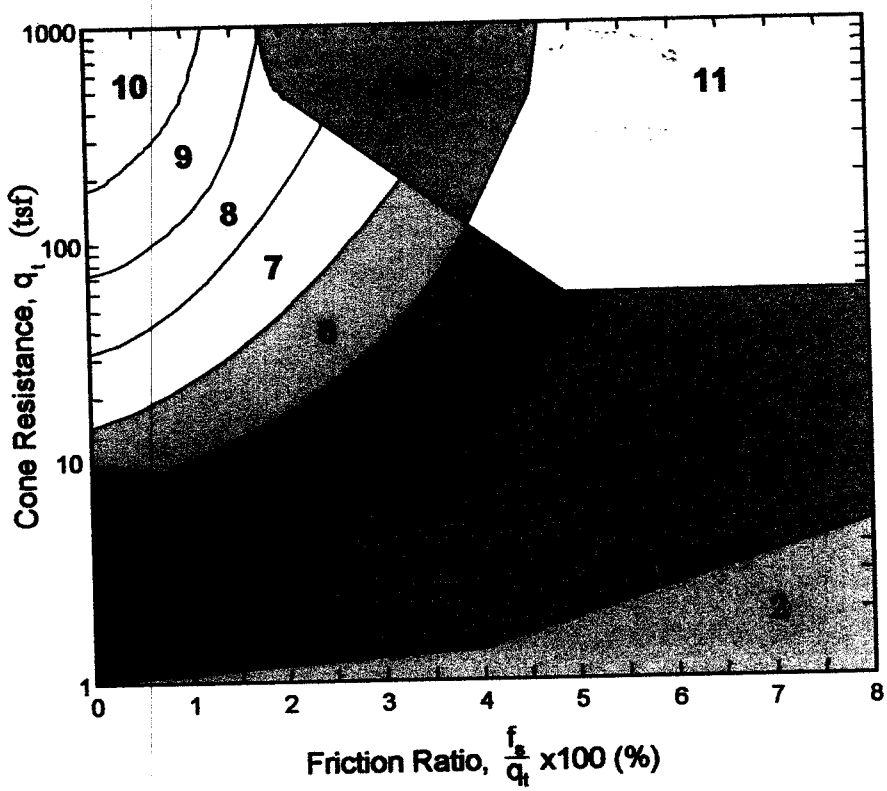
Legacy Partners - Nepturne Marina Marina Del Rey , California		PROJECT NUMBER:	L-618
		DATE:	8/3/05
SCALE: Not To Scale	DRAWN BY: T Ybarra	REVISED:	
	APPROVED BY: M Reader	FIGURE:	7

GROUP DELTA CONSULTANTS, INC.

APPENDIX A
Field Investigation

GROUP DELTA CONSULTANTS

CPT Soil Behavior Type Legend
(Robertson et al. 1986)



Zone	Soil Behavior Type
1	Sensitive, Fine Grained
2	Organic Material
3	Clay
4	Silty Clay to Clay
5	Clayey Silt to Silty Clay (Silt Mix)
6	Sandy Silt to Clayey Silt
7	Silty Sand to Sandy Silt (Sand Mix)
8	Sand to Silty Sand
9	Sand
10	Gravelly Sand to Sand
11	Very Stiff Fine Grained*
12	Sand to Clayey Sand*

*Overconsolidated or cemented

Kehoe Testing & Engineering
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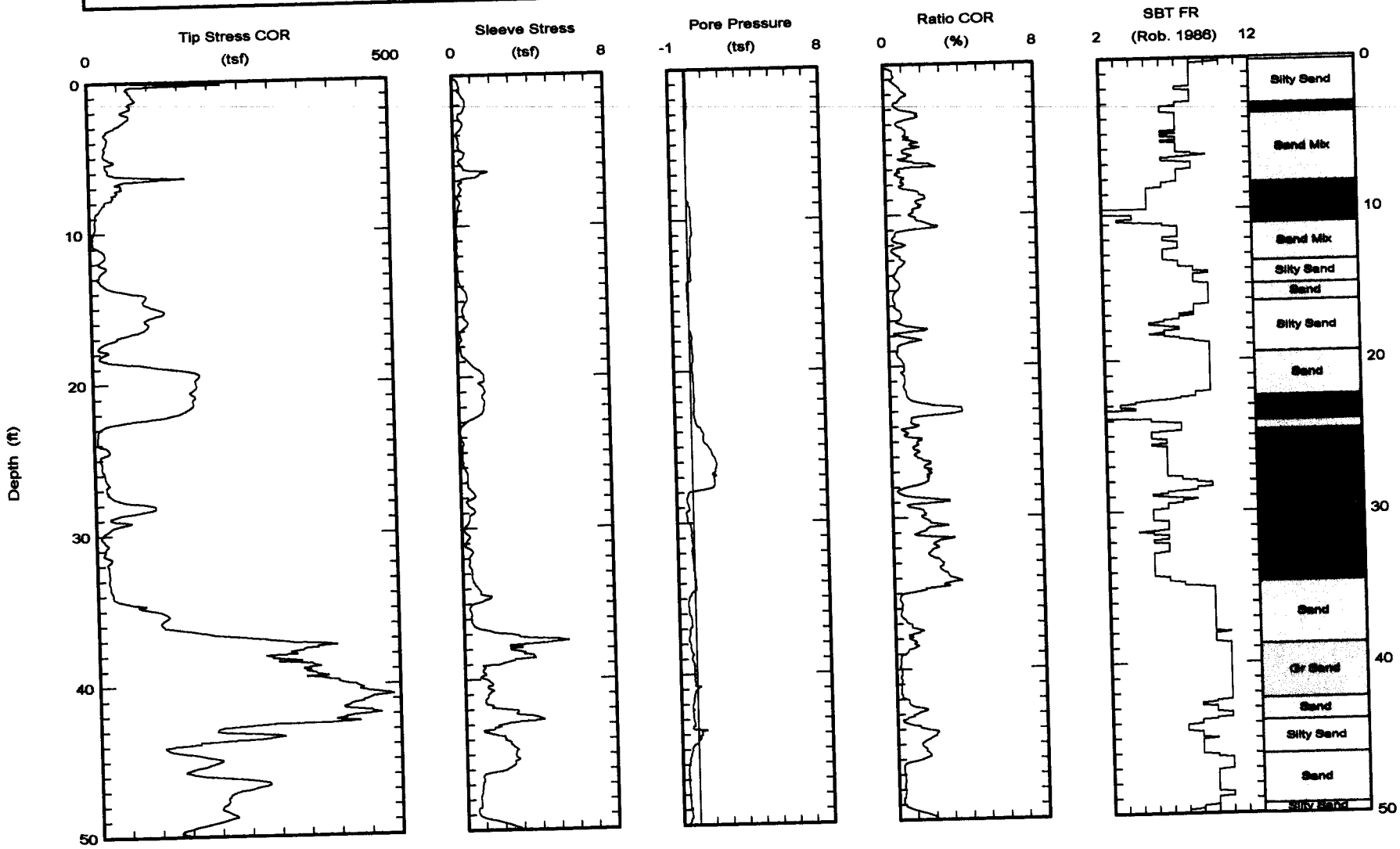
skehoe@msn.com

CPT Data
30 ton rig

Date: 09/Jun/2005
Test ID: CPT-' G-1
Project: MarinaDelRey

Client: Group Delta Consultants
Job Site: Neptune Marino Apts



Maximum depth: 100.02 (ft)
Page 1 of 3

Test ID: CPT-1
File: Z08U0505C.ECP

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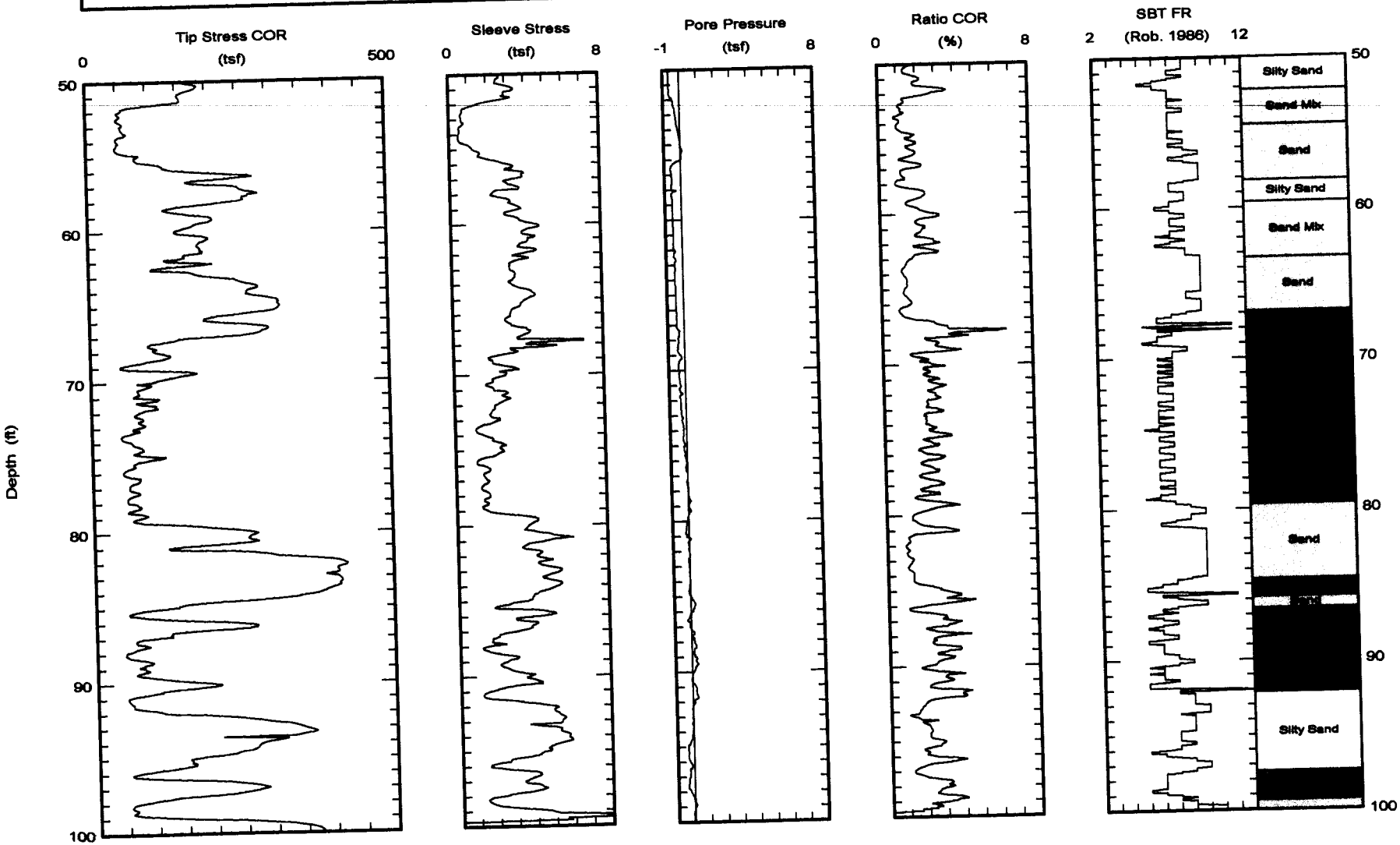
CPT Data
30 ton rig

Date: 09/Jun/2005
Test ID: CPT- G-1
Project: MarinaDelRey

Client: Group Delta Consultants
Job Site: Neptune Marino Apts



Maximum depth: 100.02 (ft)

Test ID: CPT-1
File: Z08U0505C.ECP

Boring No.: G-01

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
0.5	80	0.27	0.34	125	63	63	0.98	0.00	8	19	29	134	9E+09	50
1.5	72	0.53	0.73	125	188	188	1.33	1.60	8	17	26	106	9E+09	50
2.5	60	0.48	0.80	125	313	313	1.44	6.05	8	14	21	87	9E+09	45
3.5	33	0.40	1.22	120	435	435	1.81	21.97	7	10	15	57	9E+09	41
4.5	27	0.29	1.04	120	555	555	1.83	22.76	7	9	14	45	9E+09	39
5.5	33	0.45	1.38	120	675	675	1.97	28.53	7	10	15	47	9E+09	39
6.5	71	0.99	1.40	120	795	795	1.85	23.66	7	23	35	74	9E+09	41
7.5	42	0.34	0.79	120	916	916	1.72	18.18	7	13	20	51	9E+09	37
8.5	17	0.24	1.35	120	1036	1017	2.24	39.95	6	7	11	9.00E+09	1.13E+00	9.00E+09
9.5	10	0.15	1.58	120	1156	1075	2.50	51.29	5	5	8	9.00E+09	6.03E-01	9.00E+09
10.5	6	0.11	1.83	120	1276	1132	2.74	61.42	4	4	6	9.00E+09	3.56E-01	9.00E+09
11.5	21	0.11	0.51	120	1396	1190	1.85	23.53	7	7	10	18	9E+09	31
12.5	19	0.10	0.49	120	1516	1247	1.88	24.89	7	6	9	14	9E+09	31
13.5	27	0.16	0.58	120	1636	1305	1.83	22.96	7	9	13	26	9E+09	33
14.5	88	0.48	0.55	125	1758	1365	1.47	7.29	8	21	28	71	9E+09	39
15.5	106	0.38	0.36	125	1884	1428	1.24	0.00	9	20	26	77	9E+09	41
16.5	78	0.45	0.58	125	2009	1490	1.55	10.84	8	19	24	64	9E+09	39
17.5	23	0.16	0.69	120	2131	1551	2.01	30.58	7	7	9	16	9E+09	31
18.5	41	0.27	0.65	120	2251	1608	1.82	22.16	7	13	15	37	9E+09	33
19.5	166	1.02	0.61	125	2374	1668	1.41	5.11	9	32	37	91	9E+09	43
20.5	169	1.32	0.78	125	2499	1731	1.54	10.46	9	32	36	90	9E+09	43
21.5	162	1.34	0.83	125	2624	1794	1.58	12.32	9	31	34	88	9E+09	41
22.5	70	1.04	1.49	120	2747	1854	2.07	32.89	7	22	23	55	9E+09	37
23.5	7	0.13	1.90	120	2867	1911	2.94	69.63	4	4	4	9.00E+09	3.49E-01	9.00E+09
24.5	18	0.16	0.93	120	2987	1969	2.31	42.99	6	7	7	9.00E+09	1.07E+00	9.00E+09
25.5	13	0.17	1.32	120	3107	2027	2.56	53.80	6	5	5	9.00E+09	7.46E-01	9.00E+09
26.5	20	0.37	1.85	120	3227	2084	2.56	53.77	6	8	8	9.00E+09	1.20E+00	9.00E+09
27.5	36	0.58	1.62	120	3347	2142	2.33	43.81	7	11	10	26	9E+09	31
28.5	67	0.53	0.79	125	3470	2202	1.84	23.36	8	16	15	49	9E+09	35
29.5	31	0.41	1.31	120	3592	2262	2.30	42.75	7	10	9	19	9E+09	28
30.5	14	0.28	2.03	120	3712	2320	2.76	62.10	5	7	6	9.00E+09	8.09E-01	9.00E+09
31.5	18	0.40	2.23	120	3832	2377	2.72	60.29	5	9	8	9.00E+09	1.08E+00	9.00E+09
32.5	20	0.45	2.19	120	3952	2435	2.68	58.65	6	8	7	9.00E+09	1.23E+00	9.00E+09
33.5	22	0.61	2.73	125	4075	2495	2.75	61.65	5	11	9	9.00E+09	1.35E+00	9.00E+09
34.5	50	1.09	2.18	125	4200	2558	2.42	47.62	6	19	16	9.00E+09	3.20E+00	9.00E+09
35.5	109	0.42	0.38	125	4325	2620	1.45	6.57	9	21	17	65	9E+09	37
36.5	179	0.88	0.49	125	4450	2683	1.41	4.85	9	34	27	83	9E+09	39
37.5	339	3.48	1.03	125	4575	2746	1.64	14.52	9	65	51	108	9E+09	43
38.5	327	3.05	0.93	125	4700	2808	1.60	12.83	9	63	49	106	9E+09	43

Boring No.: G-01

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
39.5	381	1.07	0.28	130	4828	2873	0.98	0.00	10	61	46	111	9E+09	43
40.5	453	1.35	0.30	130	4958	2941	0.97	0.00	10	72	54	117	9E+09	45
41.5	432	1.29	0.30	130	5088	3009	0.98	0.00	10	69	50	115	9E+09	45
42.5	326	3.11	0.95	125	5216	3074	1.62	13.99	9	62	45	104	9E+09	43
43.5	227	1.60	0.71	125	5341	3136	1.56	11.16	9	43	30	89	9E+09	41
44.5	151	2.52	1.67	125	5466	3199	2.07	32.98	8	36	25	73	9E+09	37
45.5	166	2.57	1.55	125	5591	3262	2.02	30.67	8	40	27	76	9E+09	39
46.5	247	1.14	0.46	125	5716	3324	1.35	2.51	9	47	32	91	9E+09	41
47.5	215	0.79	0.37	125	5841	3387	1.30	0.27	9	41	27	85	9E+09	39
48.5	211	0.69	0.33	125	5966	3450	1.27	0.00	9	40	26	84	9E+09	39
49.5	159	1.74	1.10	125	6091	3512	1.88	24.86	9	30	19	73	9E+09	37
50.5	172	2.79	1.63	125	6216	3575	2.05	32.29	8	41	26	75	9E+09	37
51.5	114	2.73	2.39	120	6339	3635	2.34	44.46	7	36	23	59	9E+09	35
52.5	56	0.76	1.36	120	6459	3693	2.29	42.10	7	18	11	31	9E+09	31
53.5	58	0.63	1.09	120	6579	3750	2.19	37.92	7	18	11	32	9E+09	31
54.5	59	0.81	1.37	120	6699	3808	2.28	41.86	7	19	12	33	9E+09	31
55.5	115	2.05	1.79	120	6819	3866	2.22	39.18	7	37	22	58	9E+09	35
56.5	216	3.53	1.63	125	6942	3926	2.03	31.09	8	52	31	82	9E+09	39
57.5	264	2.95	1.12	125	7067	3988	1.80	21.47	9	51	30	90	9E+09	39
58.5	169	3.13	1.85	125	7192	4051	2.15	36.36	8	40	23	72	9E+09	37
59.5	184	3.46	1.88	125	7317	4114	2.14	36.03	8	44	25	75	9E+09	37
60.5	182	4.20	2.31	120	7440	4174	2.25	40.60	7	58	33	74	9E+09	37
61.5	170	3.96	2.34	120	7560	4231	2.27	41.59	7	54	30	71	9E+09	37
62.5	163	3.31	2.02	120	7680	4289	2.21	39.08	7	52	29	70	9E+09	37
63.5	260	3.25	1.25	125	7802	4349	1.88	24.72	9	50	27	87	9E+09	39
64.5	296	3.97	1.34	125	7927	4412	1.89	25.14	9	57	31	92	9E+09	39
65.5	254	3.43	1.35	125	8053	4474	1.93	26.82	9	49	26	86	9E+09	39
66.5	276	3.11	1.12	125	8178	4537	1.82	22.35	9	53	28	89	9E+09	39
67.5	126	4.32	3.43	125	8303	4600	2.55	53.21	6	48	25	9.00E+09	8.14E+00	9.00E+09
68.5	100	3.06	3.06	125	8428	4662	2.55	53.44	6	38	20	9.00E+09	6.39E+00	9.00E+09
69.5	126	2.64	2.09	120	8550	4722	2.32	43.39	7	40	21	58	9E+09	35
70.5	83	2.08	2.49	125	8673	4783	2.51	51.68	6	32	16	9.00E+09	5.27E+00	9.00E+09
71.5	97	2.61	2.68	125	8798	4845	2.51	51.52	6	37	19	9.00E+09	6.20E+00	9.00E+09
72.5	81	2.08	2.57	125	8923	4908	2.54	52.97	6	31	16	9.00E+09	5.11E+00	9.00E+09
73.5	61	1.47	2.39	125	9048	4970	2.59	55.19	6	23	12	9.00E+09	3.79E+00	9.00E+09
74.5	84	2.27	2.71	125	9173	5033	2.56	53.89	6	32	16	9.00E+09	5.27E+00	9.00E+09
75.5	72	1.71	2.37	125	9298	5096	2.55	53.17	6	28	14	9.00E+09	4.52E+00	9.00E+09
76.5	68	1.64	2.43	125	9424	5158	2.58	54.74	6	26	13	9.00E+09	4.19E+00	9.00E+09
77.5	65	1.57	2.42	125	9549	5221	2.60	55.26	6	25	13	9.00E+09	4.01E+00	9.00E+09

Boring No.: G-01

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
78.5	75	1.57	2.09	120	9671	5281	2.49	50.85	7	24	12	35	9E+09	28
79.5	158	3.54	2.24	120	9791	5339	2.32	43.67	7	51	26	64	9E+09	35
80.5	245	4.55	1.86	125	9914	5399	2.13	35.60	8	59	30	80	9E+09	37
81.5	292	4.08	1.40	125	10039	5461	1.96	28.16	9	56	28	87	9E+09	39
82.5	409	4.75	1.16	125	10164	5524	1.79	21.25	9	78	39	100	9E+09	41
83.5	404	5.09	1.26	125	10289	5587	1.84	23.20	9	77	39	99	9E+09	41
84.5	249	4.34	1.74	125	10414	5649	2.11	34.56	8	60	30	80	9E+09	37
85.5	104	3.51	3.38	125	10539	5712	2.64	57.24	6	40	20	9.00E+09	6.57E+00	9.00E+09
86.5	192	3.71	1.93	125	10664	5775	2.22	39.42	8	46	23	70	9E+09	35
87.5	69	2.13	3.07	125	10789	5837	2.72	60.41	6	27	14	9.00E+09	4.26E+00	9.00E+09
88.5	72	2.13	2.97	125	10915	5900	2.70	59.54	6	27	14	9.00E+09	4.41E+00	9.00E+09
89.5	105	2.77	2.64	125	11040	5963	2.54	52.73	6	40	20	9.00E+09	6.62E+00	9.00E+09
90.5	123	3.20	2.61	120	11162	6023	2.49	50.78	7	39	20	51	9E+09	33
91.5	70	2.34	3.32	125	11285	6083	2.76	62.25	6	27	14	9.00E+09	4.32E+00	9.00E+09
92.5	272	5.23	1.92	125	11410	6146	2.16	36.56	8	65	33	82	9E+09	37
93.5	320	5.17	1.62	125	11535	6208	2.04	31.50	8	77	39	88	9E+09	39
94.5	236	5.22	2.21	120	11658	6268	2.26	41.01	7	75	38	76	9E+09	37
95.5	136	3.04	2.23	120	11778	6326	2.40	47.08	7	44	22	54	9E+09	33
96.5	172	3.33	1.93	120	11898	6384	2.28	41.73	7	55	28	63	9E+09	35
97.5	178	3.69	2.07	120	12018	6441	2.30	42.82	7	57	29	64	9E+09	35
98.5	69	2.18	3.18	125	12140	6501	2.77	62.64	6	26	13	9.00E+09	4.17E+00	9.00E+09
99.5	311	4.40	1.41	125	12265	6564	1.99	29.50	9	60	30	85	9E+09	37
100.5	363	0.00	0.00	130	12393	6629	#######	#######	10	9.00E+09	9.00E+09	91	9E+09	39

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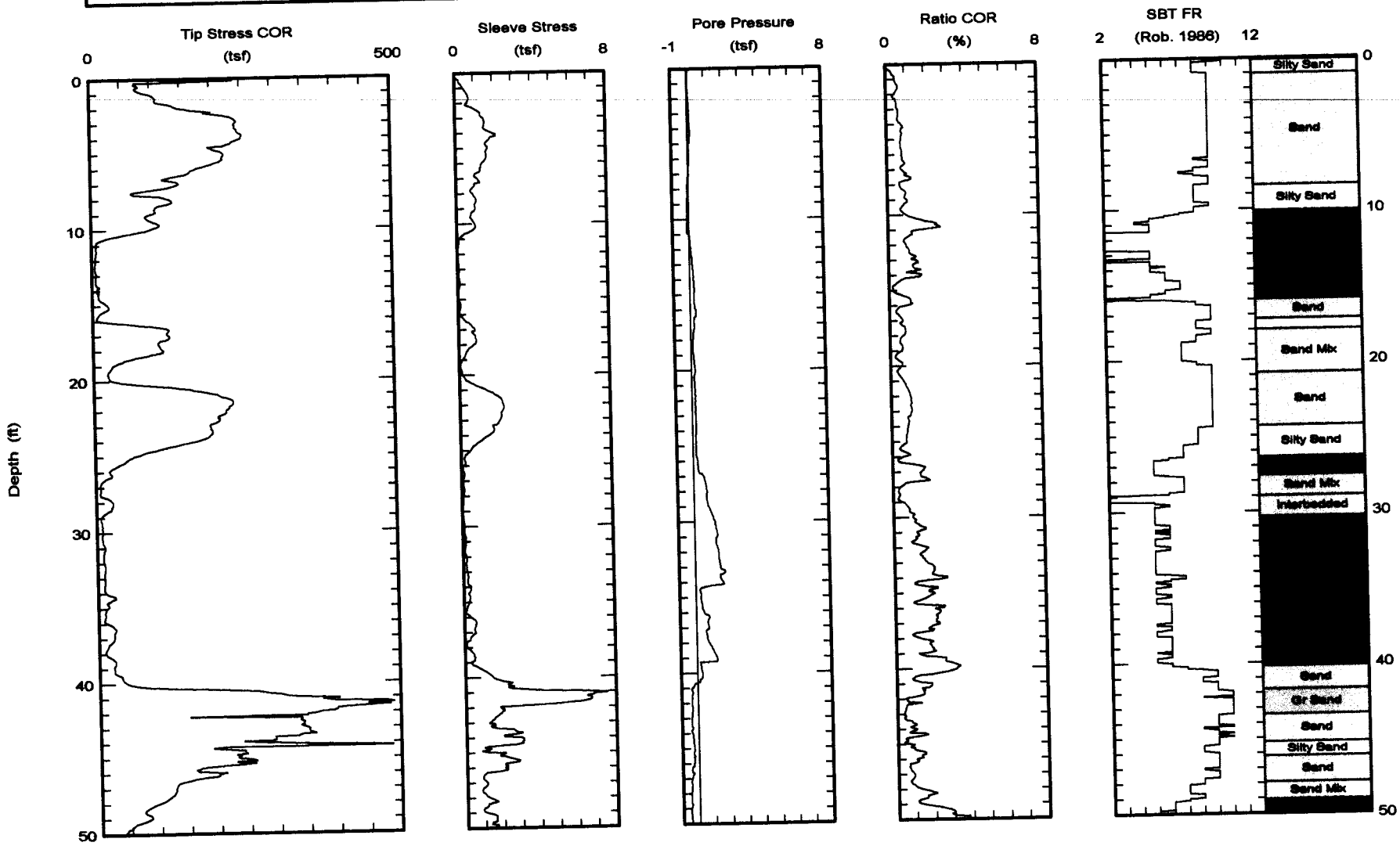
CPT Data
30 ton rig

Date: 09/Jun/2005
Test ID: CPT- G-2
Project: MarinaDelRey

Client: Group Delta Consultants
Job Site: Neptune Marino Apts



Maximum depth: 100.10 (ft)
Page 1 of 3

Test ID: CPT-2
File: Z08U0506C.ECP

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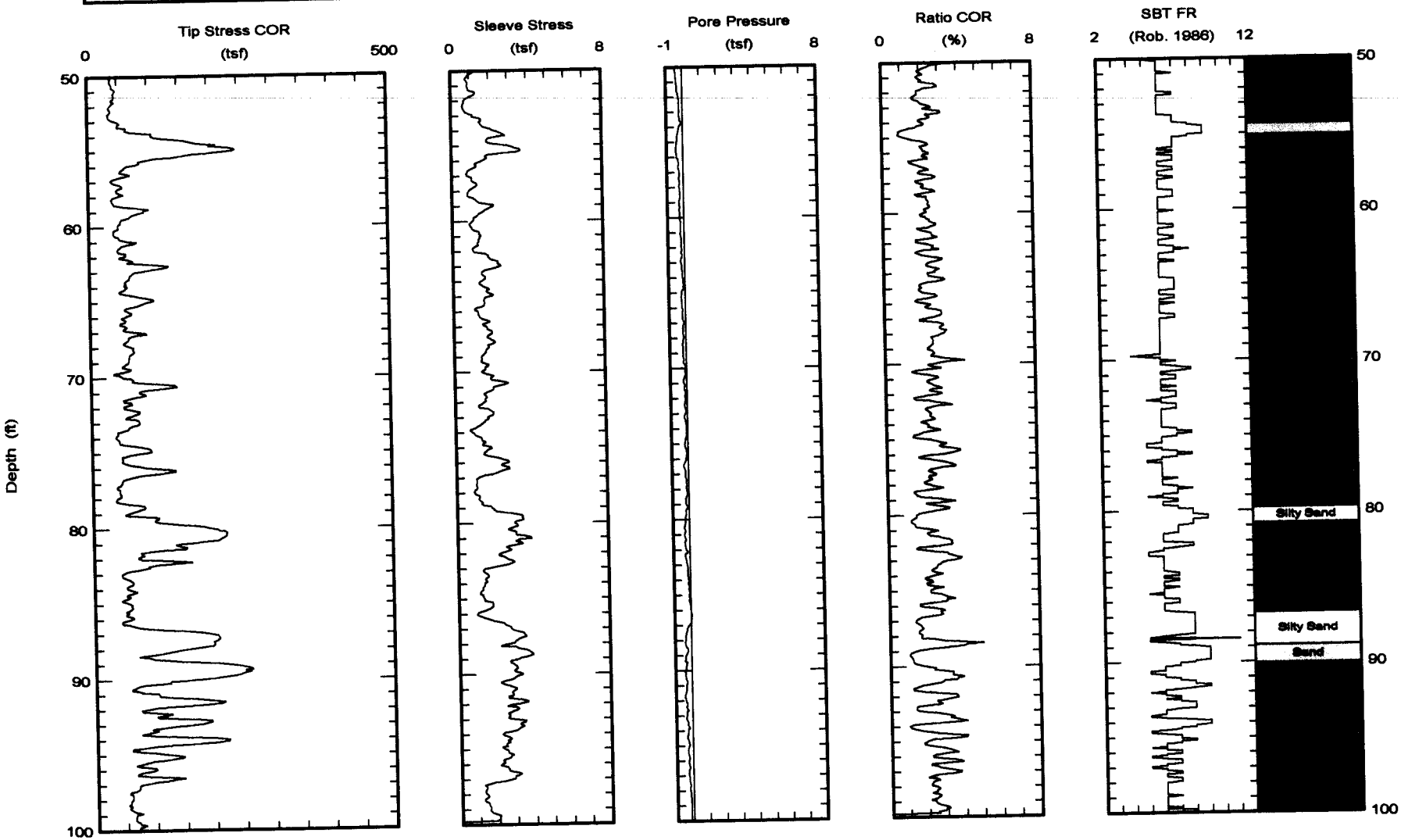
CPT Data
30 ton rig

Date: 09/Jun/2005
Test ID: CPT-2 G-2
Project: MarinaDelRey

Client: Group Delta Consultants
Job Site: Neptune Marino Apts



Maximum depth: 100.10 (ft)

Test ID: CPT-2
File: Z09U0506C.ECP

Boring No.: G-02

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
0.5	93	0.22	0.23	125	63	63	0.83	0.00	9	18	27	139	9E+09	50
1.5	119	0.68	0.57	125	188	188	1.18	0.00	9	23	35	125	9E+09	50
2.5	214	1.10	0.51	125	313	313	1.13	0.00	9	41	62	137	9E+09	50
3.5	246	1.60	0.65	125	438	438	1.26	0.00	9	47	71	135	9E+09	50
4.5	224	1.81	0.81	125	563	563	1.39	3.88	9	43	65	126	9E+09	50
5.5	209	1.61	0.77	125	688	688	1.37	3.31	9	40	60	119	9E+09	47
6.5	147	1.22	0.82	125	813	813	1.46	7.10	9	28	42	102	9E+09	45
7.5	108	0.99	0.92	125	938	938	1.59	12.49	8	26	39	86	9E+09	43
8.5	116	1.02	0.88	125	1063	1045	1.57	11.79	8	28	42	8.70E+01	9.00E+09	4.30E+01
9.5	101	0.86	0.86	125	1188	1107	1.60	12.90	8	24	36	8.00E+01	9.00E+09	4.10E+01
10.5	36	0.62	1.69	120	1311	1167	2.17	37.28	7	12	18	4.00E+01	9.00E+09	3.50E+01
11.5	8	0.08	1.07	120	1431	1225	2.47	50.10	5	4	6	9E+09	0.471	9E+09
12.5	7	0.08	1.21	110	1546	1278	2.59	55.12	1	3	4	9E+09	0.397	9E+09
13.5	8	0.11	1.39	120	1661	1330	2.59	55.13	5	4	5	9E+09	0.482	9E+09
14.5	14	0.07	0.49	120	1781	1388	2.03	31.39	6	5	7	9E+09	0.883	9E+09
15.5	17	0.12	0.70	120	1901	1446	2.11	34.74	6	6	8	9E+09	1.036	9E+09
16.5	89	0.48	0.53	125	2024	1506	1.48	7.74	8	21	26	69	9E+09	39
17.5	116	0.88	0.76	125	2149	1568	1.59	12.47	8	28	34	78	9E+09	41
18.5	73	0.45	0.61	125	2274	1631	1.61	13.54	8	18	21	60	9E+09	37
19.5	27	0.12	0.46	120	2397	1691	1.85	23.56	7	9	10	20	9E+09	31
20.5	131	0.68	0.52	125	2519	1751	1.41	4.77	9	25	28	80	9E+09	41
21.5	225	2.02	0.90	125	2644	1814	1.57	11.51	9	43	46	101	9E+09	43
22.5	209	2.26	1.08	125	2769	1876	1.68	16.40	9	40	42	97	9E+09	43
23.5	192	1.84	0.96	125	2894	1939	1.64	14.70	9	37	38	9.30E+01	9.00E+09	4.30E+01
24.5	115	0.96	0.84	125	3020	2002	1.69	16.93	8	27	27	7.20E+01	9.00E+09	3.90E+01
25.5	41	0.25	0.62	120	3142	2062	1.88	24.83	7	13	13	3.20E+01	9.00E+09	3.30E+01
26.5	16	0.13	0.81	120	3262	2120	2.32	43.47	6	6	6	9.00E+09	9.66E-01	9.00E+09
27.5	14	0.14	0.96	120	3382	2177	2.44	48.73	6	5	5	9E+09	0.817	9E+09
28.5	21	0.07	0.34	120	3502	2235	1.96	28.40	7	7	6	4	9E+09	28
29.5	9	0.08	0.90	120	3622	2292	2.61	55.88	5	4	4	9E+09	0.488	9E+09
30.5	11	0.14	1.35	120	3742	2350	2.71	59.94	5	5	4	9.00E+09	5.70E-01	9.00E+09
31.5	12	0.15	1.27	120	3862	2408	2.66	57.98	5	6	5	9.00E+09	6.32E-01	9.00E+09
32.5	13	0.20	1.58	120	3983	2465	2.72	60.42	5	6	5	9.00E+09	6.94E-01	9.00E+09
33.5	12	0.27	2.18	120	4103	2523	2.86	66.47	5	6	5	9.00E+09	6.74E-01	9.00E+09
34.5	21	0.34	1.63	125	4225	2583	2.56	53.69	6	8	7	9.00E+09	1.26E+00	9.00E+09
35.5	12	0.21	1.73	120	4348	2643	2.80	63.73	5	6	5	9E+09	0.667	9E+09
36.5	26	0.58	2.25	125	4470	2703	2.64	57.28	6	10	8	9E+09	1.56	9E+09
37.5	17	0.30	1.73	120	4593	2763	2.68	58.72	6	7	5	9E+09	1.001	9E+09
38.5	23	0.42	1.84	125	4715	2823	2.61	56.04	6	9	7	9E+09	1.36	9E+09

Boring No.: G-02

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
39.5	34	0.94	2.74	125	4841	2886	2.66	58.11	6	13	10	9E+09	2.115	9E+09
40.5	197	2.67	1.36	125	4966	2949	1.89	25.40	8	47	35	85	9E+09	39
41.5	422	5.82	1.38	125	5091	3011	1.77	20.37	9	81	59	114	9E+09	43
42.5	326	1.74	0.53	130	5218	3076	1.33	1.63	10	52	37	104	9E+09	43
43.5	318	2.08	0.66	130	5348	3144	1.44	6.39	10	51	36	102	9E+09	43
44.5	271	2.04	0.75	125	5476	3209	1.55	10.92	9	52	36	96	9E+09	41
45.5	209	2.25	1.08	125	5601	3272	1.79	21.00	9	40	27	85	9E+09	39
46.5	153	1.23	0.80	125	5726	3335	1.73	18.61	9	29	20	73	9E+09	37
47.5	115	0.98	0.85	125	5851	3397	1.84	23.22	8	28	19	61	9E+09	35
48.5	80	1.17	1.46	120	5974	3457	2.19	38.02	7	26	17	47	9E+09	33
49.5	56	1.47	2.62	125	6097	3517	2.56	53.66	6	22	14	9E+09	3.551	9E+09
50.5	41	0.96	2.33	125	6222	3580	2.60	55.61	6	16	10	9E+09	2.53	9E+09
51.5	43	1.01	2.32	125	6347	3643	2.59	55.00	6	17	11	9E+09	2.68	9E+09
52.5	38	0.76	2.01	125	6472	3705	2.58	54.39	6	14	9	9E+09	2.306	9E+09
53.5	69	1.65	2.39	125	6597	3768	2.48	50.24	6	26	16	9E+09	4.39	9E+09
54.5	184	2.35	1.27	125	6722	3831	1.94	27.25	8	44	27	77	9E+09	37
55.5	129	2.64	2.04	120	6845	3891	2.25	40.56	7	41	25	63	9E+09	35
56.5	55	1.10	2.00	120	6965	3948	2.48	50.19	7	18	11	29	9E+09	28
57.5	51	1.13	2.21	125	7087	4009	2.55	53.31	6	19	11	9E+09	3.156	9E+09
58.5	57	1.23	2.16	125	7212	4071	2.51	51.62	6	22	13	9E+09	3.548	9E+09
59.5	65	1.55	2.38	125	7337	4134	2.52	51.95	6	25	14	9E+09	4.106	9E+09
60.5	48	1.16	2.41	125	7462	4196	2.62	56.22	6	18	10	9E+09	2.968	9E+09
61.5	59	1.31	2.21	125	7588	4259	2.52	52.06	6	23	13	9E+09	3.711	9E+09
62.5	94	2.06	2.20	120	7710	4319	2.40	46.76	7	30	17	48	9E+09	33
63.5	66	1.74	2.65	125	7833	4379	2.58	54.72	6	25	14	9E+09	4.11	9E+09
64.5	75	1.76	2.36	125	7958	4442	2.50	51.03	6	29	16	9E+09	4.705	9E+09
65.5	71	1.51	2.11	120	8080	4502	2.46	49.65	7	23	12	36	9E+09	31
66.5	58	1.54	2.64	125	8203	4562	2.63	56.60	6	22	12	9E+09	3.612	9E+09
67.5	69	1.89	2.74	125	8328	4625	2.60	55.33	6	26	14	9.00E+09	4.33E+00	9.00E+09
68.5	68	1.77	2.58	125	8453	4688	2.58	54.47	6	26	13	9.00E+09	4.29E+00	9.00E+09
69.5	54	1.56	2.87	125	8578	4750	2.70	59.58	6	21	11	9E+09	3.343	9E+09
70.5	97	2.16	2.23	120	8701	4810	2.42	47.78	7	31	16	4.70E+01	9.00E+09	3.30E+01
71.5	70	1.75	2.52	125	8823	4870	2.57	54.27	6	27	14	9.00E+09	4.35E+00	9.00E+09
72.5	72	1.68	2.34	125	8948	4933	2.54	52.72	6	27	14	9.00E+09	4.47E+00	9.00E+09
73.5	56	1.29	2.28	125	9074	4996	2.60	55.38	6	22	11	9.00E+09	3.46E+00	9.00E+09
74.5	73	1.40	1.91	120	9196	5056	2.45	48.90	7	23	12	3.50E+01	9.00E+09	2.80E+01
75.5	62	1.98	3.20	125	9319	5116	2.73	61.03	6	24	12	9.00E+09	3.80E+00	9.00E+09
76.5	88	2.21	2.50	125	9444	5179	2.52	52.05	6	34	17	9.00E+09	5.58E+00	9.00E+09
77.5	45	1.04	2.28	125	9569	5241	2.69	59.12	6	17	9	9.00E+09	2.71E+00	9.00E+09

Boring No.: G-02

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
78.5	64	1.31	2.04	120	9691	5301	2.53	52.37	7	21	11	29	9E+09	28
79.5	122	2.96	2.43	120	9811	5359	2.43	48.20	7	39	20	53	9E+09	33
80.5	211	3.13	1.48	125	9934	5419	2.06	32.52	8	50	25	74	9E+09	37
81.5	112	3.02	2.70	125	10059	5482	2.51	51.46	6	43	22	9E+09	7.129	9E+09
82.5	94	2.47	2.62	125	10184	5544	2.54	52.93	6	36	18	9E+09	5.957	9E+09
83.5	56	1.46	2.62	125	10309	5607	2.70	59.78	6	21	11	9E+09	3.373	9E+09
84.5	58	1.29	2.22	125	10434	5670	2.62	56.39	6	22	11	9E+09	3.505	9E+09
85.5	59	1.52	2.58	125	10560	5732	2.69	59.05	6	23	12	9.00E+09	3.57E+00	9.00E+09
86.5	93	1.94	2.09	120	10682	5792	2.46	49.31	7	30	15	41	9E+09	31
87.5	198	3.21	1.62	125	10805	5853	2.14	35.76	8	47	24	7.00E+01	9.00E+09	3.50E+01
88.5	124	3.35	2.69	120	10927	5913	2.50	51.10	7	40	20	5.20E+01	9.00E+09	3.30E+01
89.5	236	2.98	1.26	125	11050	5973	1.98	29.09	9	45	23	7.70E+01	9.00E+09	3.70E+01
90.5	92	2.72	2.95	125	11175	6035	2.63	56.57	6	35	18	9E+09	5.777	9E+09
91.5	155	2.98	1.92	120	11297	6096	2.29	42.19	7	50	25	6.00E+01	9.00E+09	3.30E+01
92.5	135	2.71	2.01	120	11418	6153	2.35	44.80	7	43	22	54	9E+09	33
93.5	126	3.03	2.41	120	11538	6211	2.46	49.30	7	40	20	52	9E+09	33
94.5	118	2.46	2.09	120	11658	6268	2.41	47.38	7	38	19	49	9E+09	31
95.5	102	2.45	2.39	120	11778	6326	2.52	51.81	7	33	17	43	9E+09	31
96.5	96	2.69	2.79	125	11900	6386	2.60	55.61	6	37	19	9E+09	6.034	9E+09
97.5	62	1.56	2.50	125	12025	6449	2.69	59.26	6	24	12	9E+09	3.769	9E+09
98.5	58	1.39	2.38	125	12150	6511	2.69	59.43	6	22	11	9.00E+09	3.49E+00	9.00E+09
99.5	68	1.49	2.18	120	12273	6572	2.61	55.78	7	22	11	27	9E+09	28
100.5	72	0.00	0.00	125	12396	6632	#######	#######	9	9.00E+09	9.00E+09	28	9E+09	28

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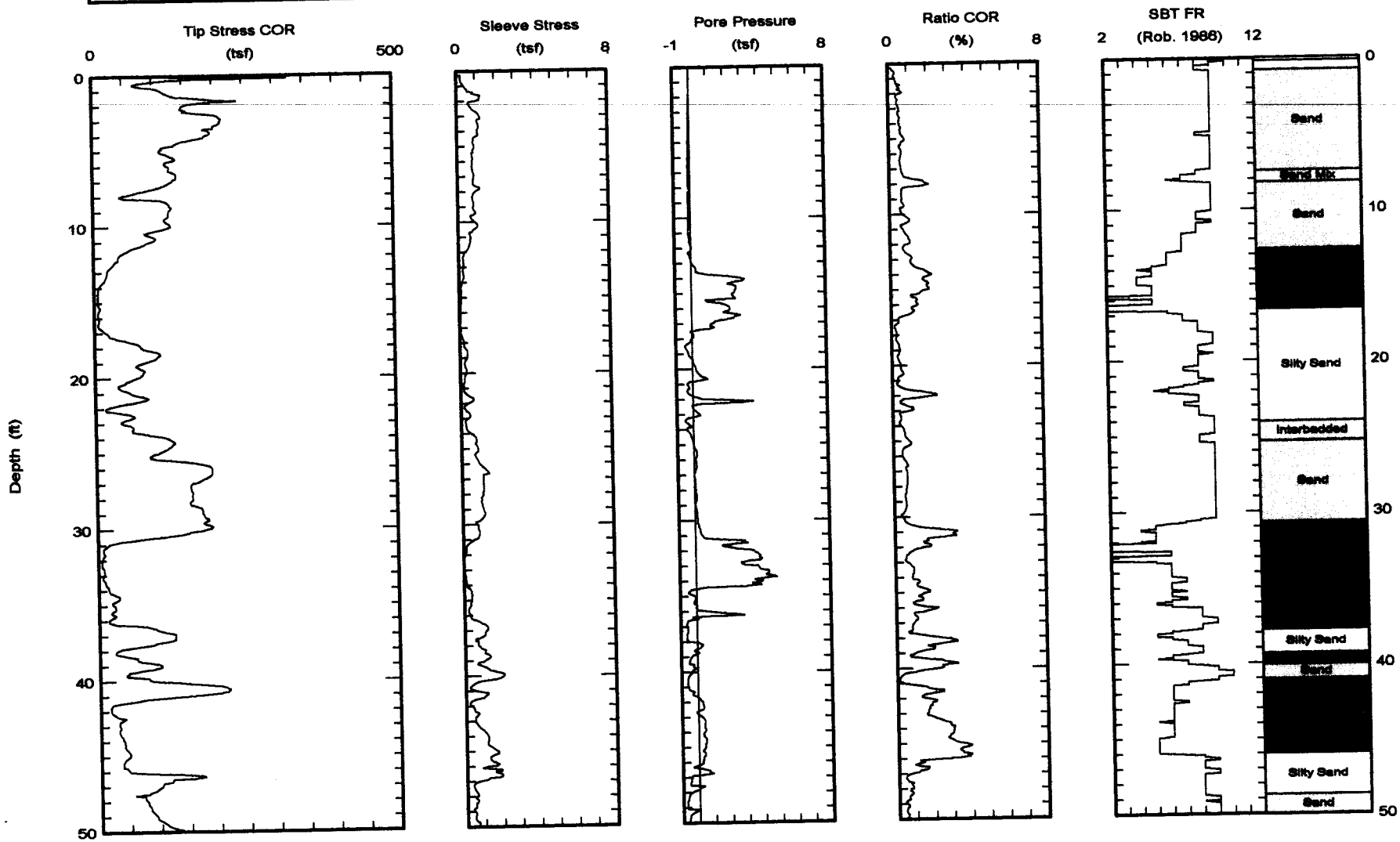
CPT Data
30 ton rig

Date: 09/Jun/2005
Test ID: CPT-G-3
Project: MarinaDelRey

Client: Group Delta Consultants
Job Site: Neptune Marino Apts



Maximum depth: 100.05 (ft)
Page 1 of 3

Test ID: CPT-3
File: Z08U0601C.ECP

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CPT Data
30 ton rig

Date: 09/Jun/2005
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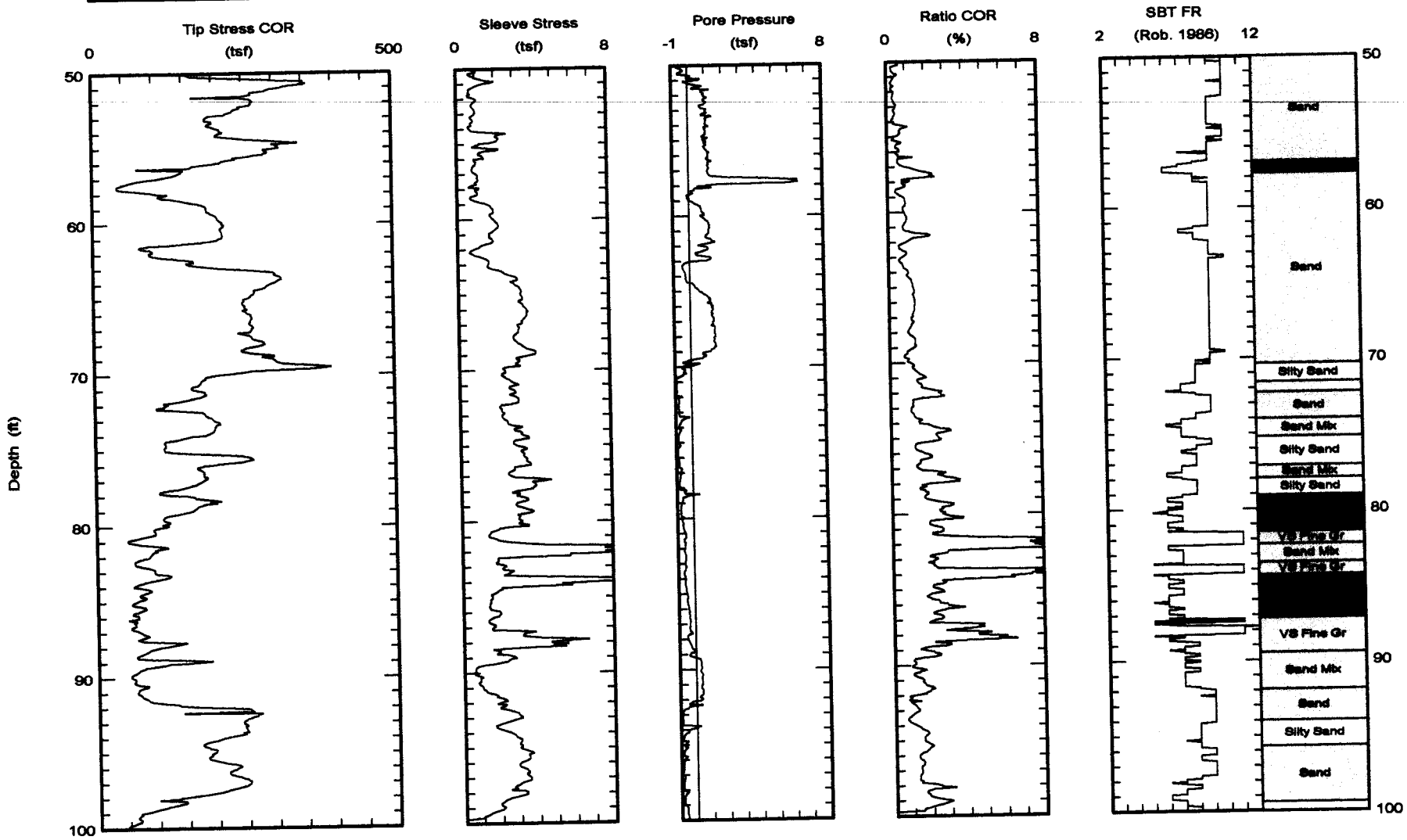

Maximum depth: 100.05 (ft)

Test ID: CPT-3
File: Z09U0601C.ECP

Boring No.: G-03

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
0.5	109	0.22	0.20	125	63	63	0.80	0.00	9	21	32	145	9E+09	50
1.5	160	0.90	0.56	125	188	188	1.20	0.00	9	31	47	137	9E+09	50
2.5	179	0.87	0.49	125	313	313	1.10	0.00	9	34	51	130	9E+09	50
3.5	201	1.14	0.57	125	438	438	1.18	0.00	9	38	57	127	9E+09	50
4.5	146	0.96	0.66	125	563	563	1.30	0.08	9	28	42	109	9E+09	47
5.5	124	0.84	0.68	125	688	688	1.36	2.62	9	24	36	99	9E+09	45
6.5	133	0.83	0.62	125	813	813	1.32	1.32	9	26	39	98	9E+09	45
7.5	97	0.94	0.97	125	938	938	1.63	14.41	8	23	35	82	9E+09	43
8.5	110	0.84	0.76	125	1063	1045	1.51	9.02	8	26	39	8.50E+01	9.00E+09	4.30E+01
9.5	124	0.82	0.67	125	1188	1107	1.43	5.75	9	24	36	8.80E+01	9.00E+09	4.30E+01
10.5	102	0.82	0.80	125	1313	1170	1.57	11.74	8	25	38	8.00E+01	9.00E+09	4.10E+01
11.5	62	0.57	0.91	125	1439	1233	1.76	19.83	8	15	22	59	9E+09	39
12.5	33	0.28	0.84	120	1561	1293	1.92	26.53	7	10	14	33	9E+09	33
13.5	17	0.24	1.39	120	1681	1350	2.34	44.58	6	6	8	9E+09	1.065	9E+09
14.5	7	0.14	1.89	120	1801	1408	2.78	63.02	4	5	7	9E+09	0.383	9E+09
15.5	8	0.10	1.35	120	1921	1466	2.64	57.18	5	4	5	9E+09	0.42	9E+09
16.5	10	0.08	0.81	120	2041	1523	2.37	45.76	6	4	5	9E+09	0.565	9E+09
17.5	50	0.14	0.27	125	2164	1583	1.43	5.99	8	12	14	45	9E+09	35
18.5	99	0.34	0.34	125	2289	1646	1.29	0.00	9	19	22	71	9E+09	39
19.5	77	0.30	0.39	125	2414	1709	1.44	6.00	8	18	20	60	9E+09	37
20.5	50	0.23	0.47	125	2539	1771	1.66	15.47	8	12	13	43	9E+09	35
21.5	59	0.42	0.71	125	2664	1834	1.78	20.63	8	14	15	49	9E+09	35
22.5	45	0.35	0.76	120	2787	1894	1.90	25.68	7	14	15	38	9E+09	33
23.5	74	0.31	0.42	125	2909	1954	1.52	9.43	8	18	18	5.60E+01	9.00E+09	3.70E+01
24.5	121	0.78	0.64	125	3035	2017	1.56	11.19	9	23	23	7.40E+01	9.00E+09	3.90E+01
25.5	133	0.82	0.62	125	3160	2079	1.52	9.76	9	26	25	7.70E+01	9.00E+09	3.90E+01
26.5	183	1.20	0.66	125	3285	2142	1.48	7.93	9	35	33	8.90E+01	9.00E+09	4.10E+01
27.5	158	1.15	0.72	125	3410	2205	1.57	11.70	9	30	28	83	9E+09	41
28.5	166	1.06	0.64	125	3535	2267	1.51	9.00	9	32	29	84	9E+09	41
29.5	183	1.03	0.56	125	3660	2330	1.43	5.73	9	35	31	87	9E+09	41
30.5	104	0.84	0.81	125	3785	2393	1.75	19.45	8	25	22	6.50E+01	9.00E+09	3.70E+01
31.5	11	0.25	2.34	120	3908	2453	2.94	69.73	5	5	4	9.00E+09	5.56E-01	9.00E+09
32.5	8	0.06	0.75	120	4028	2510	2.63	56.85	5	4	3	9.00E+09	3.87E-01	9.00E+09
33.5	12	0.11	0.92	120	4148	2568	2.55	53.35	6	5	4	9.00E+09	6.26E-01	9.00E+09
34.5	27	0.36	1.33	125	4270	2628	2.40	46.79	6	10	8	9.00E+09	1.66E+00	9.00E+09
35.5	25	0.31	1.27	125	4395	2691	2.42	47.84	6	9	7	9E+09	1.501	9E+09
36.5	75	0.84	1.11	125	4521	2753	2.02	30.89	8	18	14	49	9E+09	35
37.5	92	0.87	0.95	125	4646	2816	1.90	25.68	8	22	17	56	9E+09	35
38.5	60	1.11	1.85	120	4768	2876	2.32	43.67	7	19	14	40	9E+09	33

Boring No.: G-03

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
39.5	72	1.33	1.85	120	4888	2934	2.28	41.95	7	23	17	46	9E+09	33
40.5	185	0.81	0.44	125	5011	2994	1.38	3.82	9	35	26	82	9E+09	39
41.5	52	0.67	1.29	120	5133	3054	2.22	39.46	7	17	12	33	9E+09	31
42.5	30	0.53	1.76	125	5256	3114	2.54	52.80	6	11	8	9E+09	1.815	9E+09
43.5	34	0.85	2.50	125	5381	3177	2.65	57.72	6	13	9	9E+09	2.087	9E+09
44.5	43	1.26	2.93	125	5506	3239	2.66	57.96	6	17	12	9E+09	2.689	9E+09
45.5	41	1.48	3.61	125	5631	3302	2.77	62.82	5	20	14	9E+09	2.552	9E+09
46.5	119	1.47	1.24	125	5756	3365	2.00	29.97	8	28	19	63	9E+09	37
47.5	81	0.47	0.57	125	5881	3427	1.79	21.15	8	19	13	47	9E+09	33
48.5	83	0.48	0.58	125	6006	3490	1.80	21.34	8	20	13	48	9E+09	33
49.5	109	0.51	0.47	125	6132	3553	1.63	14.13	9	21	13	58	9E+09	35
50.5	274	1.16	0.42	130	6259	3618	1.31	0.65	10	44	28	93	9E+09	41
51.5	266	0.85	0.32	130	6389	3685	1.21	0.00	10	43	27	92	9E+09	41
52.5	235	0.94	0.40	125	6517	3751	1.34	1.98	9	45	28	87	9E+09	39
53.5	202	0.79	0.39	125	6642	3813	1.38	3.85	9	39	24	80	9E+09	39
54.5	270	1.79	0.66	125	6767	3876	1.54	10.24	9	52	31	91	9E+09	41
55.5	262	1.39	0.53	125	6892	3938	1.45	6.46	9	50	30	90	9E+09	39
56.5	145	0.91	0.63	125	7017	4001	1.69	16.93	9	28	16	66	9E+09	37
57.5	66	1.01	1.53	120	7140	4061	2.31	43.31	7	21	12	36	9E+09	31
58.5	149	0.99	0.67	125	7262	4121	1.72	17.93	9	29	17	67	9E+09	37
59.5	204	1.83	0.90	125	7388	4184	1.77	20.20	9	39	22	79	9E+09	39
60.5	216	1.99	0.92	125	7513	4247	1.77	20.19	9	41	23	81	9E+09	39
61.5	123	1.56	1.27	125	7638	4309	2.07	32.85	8	29	16	59	9E+09	35
62.5	152	1.20	0.79	125	7763	4372	1.80	21.68	9	29	16	66	9E+09	35
63.5	297	2.35	0.79	125	7888	4435	1.63	14.20	9	57	31	92	9E+09	39
64.5	273	3.17	1.16	125	8013	4497	1.84	23.00	9	52	28	89	9E+09	39
65.5	252	3.41	1.35	125	8138	4560	1.93	27.14	9	48	25	85	9E+09	39
66.5	263	3.52	1.34	125	8263	4622	1.92	26.69	9	50	26	86	9E+09	39
67.5	265	3.08	1.16	125	8388	4685	1.85	23.73	9	51	26	8.70E+01	9.00E+09	3.90E+01
68.5	271	3.56	1.31	125	8513	4748	1.91	26.18	9	52	27	8.70E+01	9.00E+09	3.90E+01
69.5	315	3.06	0.97	125	8638	4810	1.73	18.65	9	60	31	93	9E+09	39
70.5	179	2.58	1.44	125	8763	4873	2.06	32.48	8	43	22	7.00E+01	9.00E+09	3.70E+01
71.5	161	2.89	1.79	125	8889	4936	2.19	38.11	8	39	20	6.60E+01	9.00E+09	3.50E+01
72.5	155	2.47	1.59	125	9014	4998	2.15	36.36	8	37	19	6.40E+01	9.00E+09	3.50E+01
73.5	200	2.64	1.32	125	9139	5061	2.00	30.04	8	48	24	7.40E+01	9.00E+09	3.70E+01
74.5	126	3.18	2.51	120	9261	5121	2.42	47.95	7	40	20	5.60E+01	9.00E+09	3.30E+01
75.5	213	3.38	1.59	125	9384	5181	2.08	33.34	8	51	26	7.60E+01	9.00E+09	3.70E+01
76.5	180	3.02	1.68	125	9509	5244	2.15	36.33	8	43	22	6.90E+01	9.00E+09	3.50E+01
77.5	144	3.82	2.66	120	9632	5304	2.43	48.15	7	46	23	6.00E+01	9.00E+09	3.50E+01

Boring No.: G-03

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
78.5	179	3.14	1.76	125	9754	5364	2.18	37.52	8	43	22	68	9E+09	35
79.5	123	3.33	2.70	120	9877	5424	2.48	50.30	7	39	20	54	9E+09	33
80.5	86	2.31	2.68	125	9999	5484	2.58	54.37	6	33	17	9E+09	5.42	9E+09
81.5	91	4.77	5.24	135	10129	5552	2.88	67.27	11	87	44	9E+09	9E+09	9E+09
82.5	77	3.58	4.64	135	10264	5625	2.87	66.78	11	74	37	9E+09	9E+09	9E+09
83.5	94	4.21	4.49	135	10400	5697	2.80	64.09	11	90	45	9E+09	9E+09	9E+09
84.5	77	3.00	3.92	125	10530	5765	2.80	63.81	5	37	19	9E+09	4.756	9E+09
85.5	67	1.52	2.25	125	10655	5828	2.59	54.88	6	26	13	9.00E+09	4.14E+00	9.00E+09
86.5	62	1.65	2.68	125	10780	5890	2.70	59.50	6	24	12	9E+09	3.744	9E+09
87.5	97	3.63	3.75	125	10905	5953	2.72	60.56	5	46	23	9.00E+09	6.10E+00	9.00E+09
88.5	94	2.99	3.20	125	11030	6015	2.66	57.93	6	36	18	9.00E+09	5.87E+00	9.00E+09
89.5	83	1.49	1.79	120	11153	6076	2.44	48.42	7	27	14	3.60E+01	9.00E+09	2.80E+01
90.5	67	0.82	1.23	120	11273	6133	2.35	44.84	7	21	11	27	9E+09	28
91.5	96	1.61	1.67	120	11393	6191	2.37	45.50	7	31	16	4.10E+01	9.00E+09	3.10E+01
92.5	244	2.50	1.02	125	11515	6251	1.89	25.12	9	47	24	77	9E+09	37
93.5	241	2.11	0.88	125	11640	6314	1.82	22.43	9	46	23	76	9E+09	37
94.5	188	2.88	1.53	125	11765	6376	2.15	36.12	8	45	23	67	9E+09	35
95.5	203	3.31	1.63	125	11891	6439	2.16	36.60	8	49	25	69	9E+09	35
96.5	230	3.19	1.38	125	12016	6502	2.05	32.14	8	55	28	74	9E+09	37
97.5	209	3.05	1.46	125	12141	6564	2.10	34.36	8	50	25	70	9E+09	35
98.5	115	2.33	2.03	120	12263	6624	2.42	47.84	7	37	19	4.70E+01	9.00E+09	3.10E+01
99.5	61	1.00	1.64	120	12383	6682	2.53	52.50	7	20	10	22	9E+09	28
100.5	48	0.00	0.00	125	12506	6742	#######	#######	8	9.00E+09	9.00E+09	13	9E+09	28

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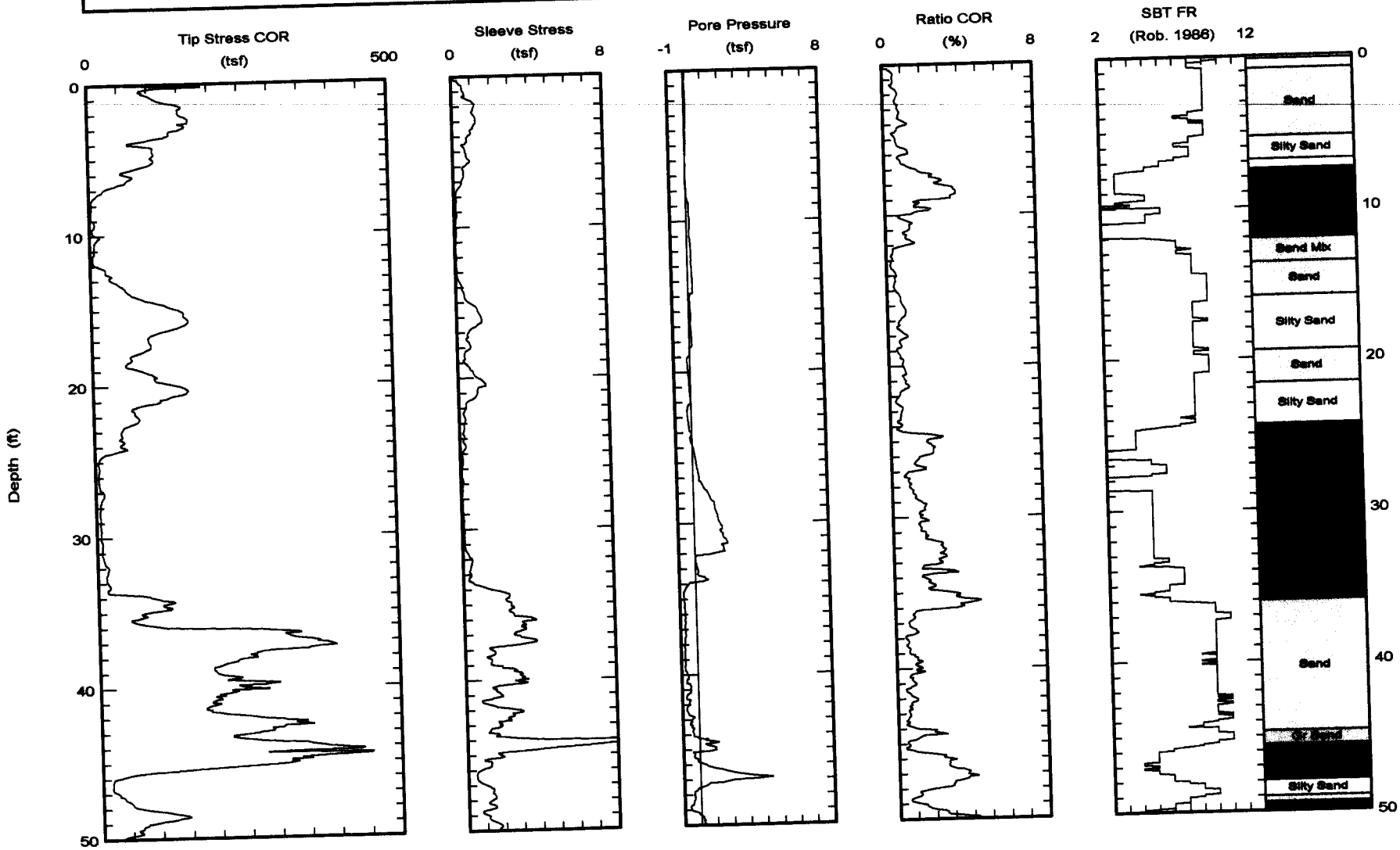
CPT Data
30 ton rig

Date: 09/Jun/2005
Test ID: CPT- G-4
Project: MarinaDelRey

Client: Group Delta Consultants
Job Site: Neptune Marino Apts



Maximum depth: 100.15 (ft)

Test ID: CPT-4
File: Z09U0503C.ECP

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CPT Data
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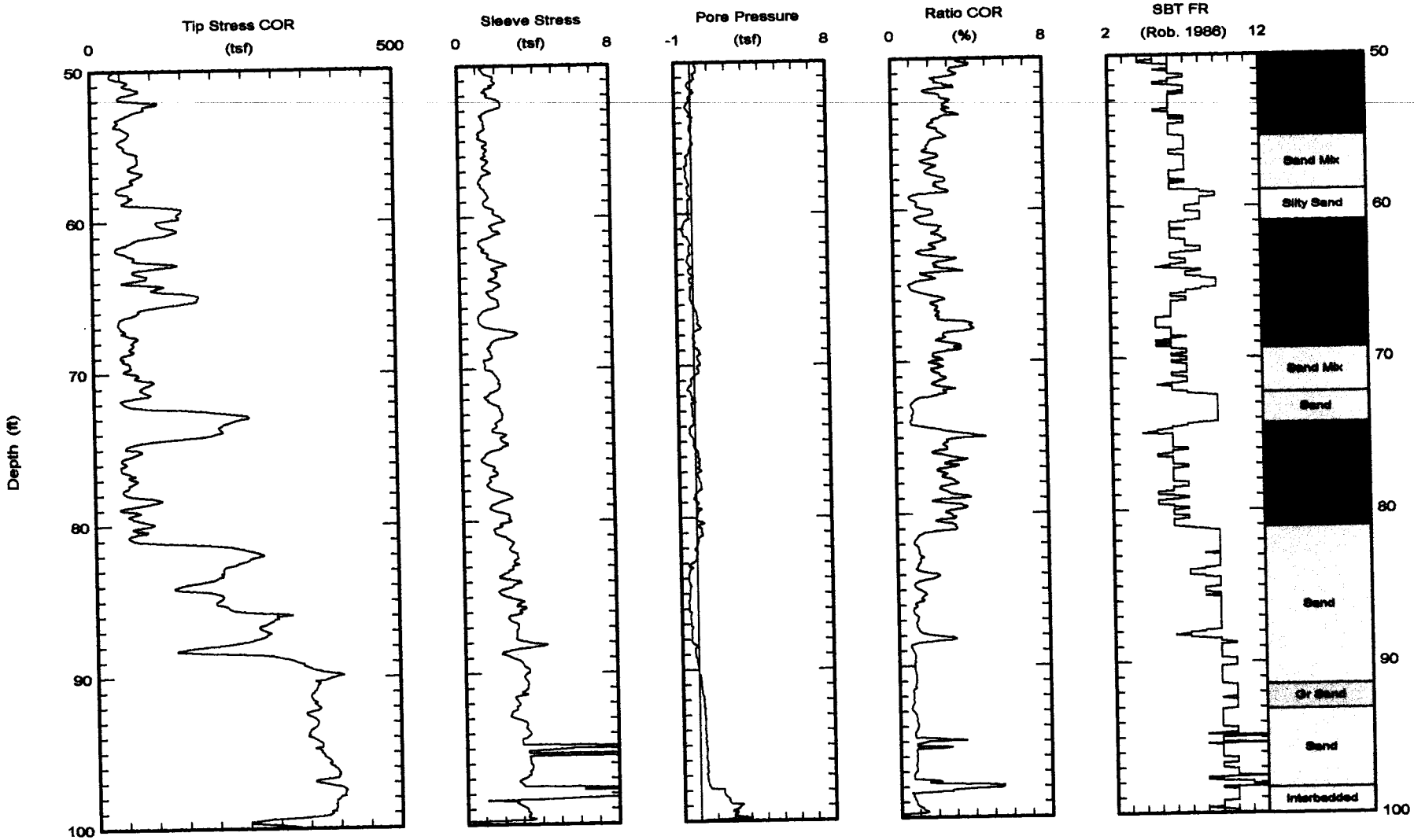

Maximum depth: 100.15 (ft)
Page 2 of 3

Test ID: CPT-4
File: Z08U0503C.ECP

Boring No.: G-04

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
0.5	98	0.41	0.42	125	63	63	1.12	0.00	9	19	29	141	9E+09	50
1.5	141	0.88	0.62	125	188	188	1.24	0.00	9	27	41	132	9E+09	50
2.5	161	1.17	0.73	125	313	313	1.32	1.26	9	31	47	126	9E+09	50
3.5	119	1.07	0.90	125	438	438	1.47	7.37	8	28	42	107	9E+09	47
4.5	103	0.68	0.66	125	563	563	1.34	2.03	8	25	38	96	9E+09	45
5.5	84	0.76	0.90	125	688	688	1.57	11.68	8	20	30	83	9E+09	43
6.5	56	0.53	0.96	120	811	811	1.71	17.72	7	18	27	64	9E+09	41
7.5	12	0.27	2.27	120	931	931	2.55	53.28	5	6	9	9E+09	0.751	9E+09
8.5	4	0.14	3.51	120	1051	1032	3.11	77.17	3	4	6	9.00E+09	2.32E-01	9.00E+09
9.5	7	0.12	1.66	120	1171	1090	2.62	56.39	5	3	5	9.00E+09	4.45E-01	9.00E+09
10.5	11	0.11	1.06	120	1291	1147	2.33	44.12	5	5	8	9.00E+09	6.65E-01	9.00E+09
11.5	6	0.07	1.17	110	1406	1200	2.59	55.01	1	3	4	9E+09	0.357	9E+09
12.5	27	0.10	0.37	120	1521	1253	1.66	15.40	7	9	13	27	9E+09	33
13.5	53	0.18	0.35	125	1644	1313	1.43	5.66	8	13	18	51	9E+09	37
14.5	106	0.47	0.44	125	1769	1375	1.32	1.18	9	20	27	77	9E+09	41
15.5	156	1.09	0.70	125	1894	1438	1.46	7.21	9	30	39	91	9E+09	43
16.5	119	1.07	0.91	125	2019	1501	1.66	15.37	8	28	35	80	9E+09	41
17.5	90	0.62	0.69	125	2144	1563	1.60	12.99	8	22	27	68	9E+09	39
18.5	65	0.44	0.68	125	2269	1626	1.70	17.14	8	16	19	55	9E+09	37
19.5	107	0.75	0.70	125	2394	1689	1.58	12.15	8	26	30	74	9E+09	39
20.5	143	1.21	0.85	125	2519	1751	1.62	13.77	9	27	30	84	9E+09	41
21.5	79	0.65	0.82	125	2644	1814	1.76	19.61	8	19	20	60	9E+09	37
22.5	63	0.31	0.49	125	2769	1876	1.62	13.63	8	15	16	51	9E+09	35
23.5	46	0.26	0.55	125	2894	1939	1.77	20.17	8	11	11	3.80E+01	9.00E+09	3.30E+01
24.5	26	0.24	0.92	120	3017	1999	2.17	37.27	7	8	8	1.50E+01	9.00E+09	2.80E+01
25.5	7	0.15	2.18	120	3137	2057	3.03	73.47	4	4	4	9.00E+09	3.40E-01	9.00E+09
26.5	8	0.11	1.40	120	3257	2114	2.81	64.34	5	4	4	9.00E+09	4.03E-01	9.00E+09
27.5	11	0.09	0.84	120	3377	2172	2.50	50.96	6	4	4	9E+09	0.612	9E+09
28.5	7	0.09	1.21	120	3497	2230	2.81	64.32	5	3	3	9E+09	0.352	9E+09
29.5	8	0.13	1.60	120	3617	2287	2.89	67.73	5	4	4	9E+09	0.384	9E+09
30.5	9	0.14	1.54	120	3737	2345	2.82	64.67	5	4	4	9.00E+09	4.67E-01	9.00E+09
31.5	12	0.27	2.22	120	3857	2403	2.86	66.64	5	6	5	9.00E+09	6.50E-01	9.00E+09
32.5	17	0.44	2.65	120	3978	2460	2.83	65.14	5	8	7	9.00E+09	9.73E-01	9.00E+09
33.5	36	0.67	1.87	125	4100	2520	2.44	48.51	6	14	12	9.00E+09	2.26E+00	9.00E+09
34.5	113	2.31	2.05	120	4223	2580	2.19	37.98	7	36	30	6.60E+01	9.00E+09	3.70E+01
35.5	76	2.76	3.65	125	4345	2641	2.57	54.02	5	36	29	9E+09	4.914	9E+09
36.5	306	3.14	1.03	125	4470	2703	1.65	15.17	9	59	47	104	9E+09	43
37.5	324	2.86	0.88	125	4595	2766	1.57	11.58	9	62	48	106	9E+09	43
38.5	216	1.43	0.66	125	4721	2828	1.51	9.33	9	41	31	89	9E+09	41

Boring No.: G-04

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
39.5	235	2.68	1.14	125	4846	2891	1.77	20.01	9	45	34	92	9E+09	41
40.5	216	2.10	0.97	125	4971	2954	1.71	17.57	9	41	30	89	9E+09	41
41.5	198	1.51	0.76	125	5096	3016	1.62	13.68	9	38	28	85	9E+09	39
42.5	305	2.34	0.77	125	5221	3079	1.53	9.95	9	58	42	101	9E+09	43
43.5	287	1.92	0.67	125	5346	3142	1.48	7.78	9	55	39	98	9E+09	41
44.5	374	5.16	1.38	125	5471	3204	1.80	21.53	9	72	50	108	9E+09	43
45.5	144	1.18	0.82	125	5596	3267	1.75	19.39	9	28	19	71	9E+09	37
46.5	19	0.58	3.12	120	5719	3327	2.97	71.05	5	9	6	9E+09	1.019	9E+09
47.5	44	1.32	3.01	125	5841	3387	2.68	58.83	6	17	11	9E+09	2.733	9E+09
48.5	114	1.11	0.97	125	5966	3450	1.91	25.95	8	27	18	61	9E+09	35
49.5	60	1.46	2.43	125	6091	3512	2.50	51.32	6	23	15	9E+09	3.808	9E+09
50.5	45	1.57	3.48	125	6217	3575	2.76	61.99	5	22	14	9E+09	2.8	9E+09
51.5	62	1.67	2.67	125	6342	3638	2.55	53.13	6	24	15	9E+09	3.954	9E+09
52.5	85	2.07	2.43	120	6464	3698	2.42	47.94	7	27	17	48	9E+09	33
53.5	48	1.36	2.85	125	6587	3758	2.66	58.13	6	18	11	9E+09	2.954	9E+09
54.5	55	1.24	2.24	125	6712	3821	2.52	51.88	6	21	13	9E+09	3.464	9E+09
55.5	68	1.46	2.14	120	6834	3881	2.44	48.56	7	22	13	38	9E+09	31
56.5	74	1.43	1.94	120	6955	3938	2.38	45.99	7	23	14	41	9E+09	31
57.5	60	1.27	2.12	120	7075	3996	2.48	50.47	7	19	11	32	9E+09	31
58.5	60	1.44	2.40	125	7197	4056	2.54	52.91	6	23	13	9E+09	3.762	9E+09
59.5	139	1.69	1.21	125	7322	4119	2.00	30.05	8	33	19	64	9E+09	35
60.5	124	1.98	1.60	125	7447	4181	2.17	36.99	8	30	17	59	9E+09	35
61.5	59	1.44	2.42	125	7572	4244	2.56	53.83	6	23	13	9E+09	3.702	9E+09
62.5	85	1.51	1.78	120	7695	4304	2.32	43.70	7	27	15	44	9E+09	33
63.5	81	2.06	2.55	125	7818	4364	2.51	51.44	6	31	17	9E+09	5.118	9E+09
64.5	119	1.81	1.52	125	7943	4427	2.17	37.06	8	28	15	57	9E+09	35
65.5	129	1.84	1.42	125	8068	4490	2.12	34.94	8	31	17	60	9E+09	35
66.5	51	1.12	2.22	125	8193	4552	2.59	55.19	6	19	10	9E+09	3.093	9E+09
67.5	60	2.16	3.60	125	8318	4615	2.76	62.36	5	29	15	9.00E+09	3.72E+00	9.00E+09
68.5	59	1.63	2.76	125	8443	4677	2.65	57.56	6	23	12	9.00E+09	3.66E+00	9.00E+09
69.5	56	1.42	2.52	125	8568	4740	2.63	56.59	6	22	11	9E+09	3.468	9E+09
70.5	84	1.84	2.19	120	8691	4800	2.45	49.10	7	27	14	4.10E+01	9.00E+09	3.10E+01
71.5	70	1.72	2.45	125	8813	4860	2.56	53.66	6	27	14	9.00E+09	4.39E+00	9.00E+09
72.5	169	1.88	1.11	125	8938	4923	1.96	28.23	9	32	16	6.80E+01	9.00E+09	3.50E+01
73.5	217	1.94	0.90	125	9063	4986	1.80	21.36	9	42	21	7.70E+01	9.00E+09	3.70E+01
74.5	114	2.08	1.82	120	9186	5046	2.30	42.56	7	36	18	5.20E+01	9.00E+09	3.30E+01
75.5	60	1.61	2.67	125	9309	5106	2.66	57.86	6	23	12	9.00E+09	3.71E+00	9.00E+09
76.5	53	1.55	2.92	125	9434	5169	2.74	61.26	6	20	10	9.00E+09	3.23E+00	9.00E+09
77.5	56	1.47	2.62	125	9559	5231	2.68	58.64	6	22	11	9.00E+09	3.44E+00	9.00E+09

Boring No.: G-04

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
78.5	77	2.14	2.79	125	9684	5294	2.62	56.12	6	29	15	9E+09	4.793	9E+09
79.5	72	2.06	2.85	125	9809	5356	2.65	57.39	6	28	14	9E+09	4.494	9E+09
80.5	69	1.95	2.82	125	9934	5419	2.66	57.83	6	27	14	9E+09	4.283	9E+09
81.5	211	2.49	1.18	125	10059	5482	1.95	28.02	9	40	20	74	9E+09	37
82.5	236	2.78	1.18	125	10184	5544	1.93	26.99	9	45	23	78	9E+09	37
83.5	190	2.37	1.25	125	10309	5607	2.02	30.60	8	45	23	70	9E+09	35
84.5	179	2.32	1.30	125	10434	5670	2.05	32.12	8	43	22	67	9E+09	35
85.5	238	2.95	1.24	125	10560	5732	1.96	28.30	9	46	23	7.80E+01	9.00E+09	3.70E+01
86.5	285	2.66	0.94	125	10685	5795	1.79	20.84	9	55	28	85	9E+09	39
87.5	253	2.86	1.13	125	10810	5858	1.91	26.03	9	48	24	8.00E+01	9.00E+09	3.70E+01
88.5	230	2.89	1.25	125	10935	5920	1.98	29.15	9	44	22	7.60E+01	9.00E+09	3.70E+01
89.5	364	3.10	0.85	125	11060	5983	1.69	16.75	9	70	35	9.30E+01	9.00E+09	3.90E+01
90.5	368	3.24	0.88	125	11185	6046	1.70	17.41	9	70	35	94	9E+09	39
91.5	358	2.93	0.82	125	11310	6108	1.68	16.33	9	69	35	9.20E+01	9.00E+09	3.90E+01
92.5	358	2.57	0.72	130	11438	6173	1.62	13.87	10	57	29	92	9E+09	39
93.5	355	3.22	0.91	125	11565	6238	1.73	18.71	9	68	34	92	9E+09	39
94.5	366	4.73	1.29	125	11690	6301	1.90	25.69	9	70	35	93	9E+09	39
95.5	381	4.38	1.15	125	11815	6364	1.84	22.99	9	73	37	94	9E+09	39
96.5	387	3.36	0.87	125	11941	6426	1.70	17.24	9	74	37	94	9E+09	39
97.5	401	5.50	1.37	125	12066	6489	1.92	26.37	9	77	39	96	9E+09	39
98.5	392	4.34	1.11	125	12191	6552	1.82	22.24	9	75	38	9.40E+01	9.00E+09	3.90E+01
99.5	314	2.56	0.81	125	12316	6614	1.73	18.48	9	60	30	86	9E+09	37
100.5	365	0.00	0.00	130	12443	6679	#######	#######	10	9.00E+09	9.00E+09	91	9E+09	39

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CPT Data
30 ton rig

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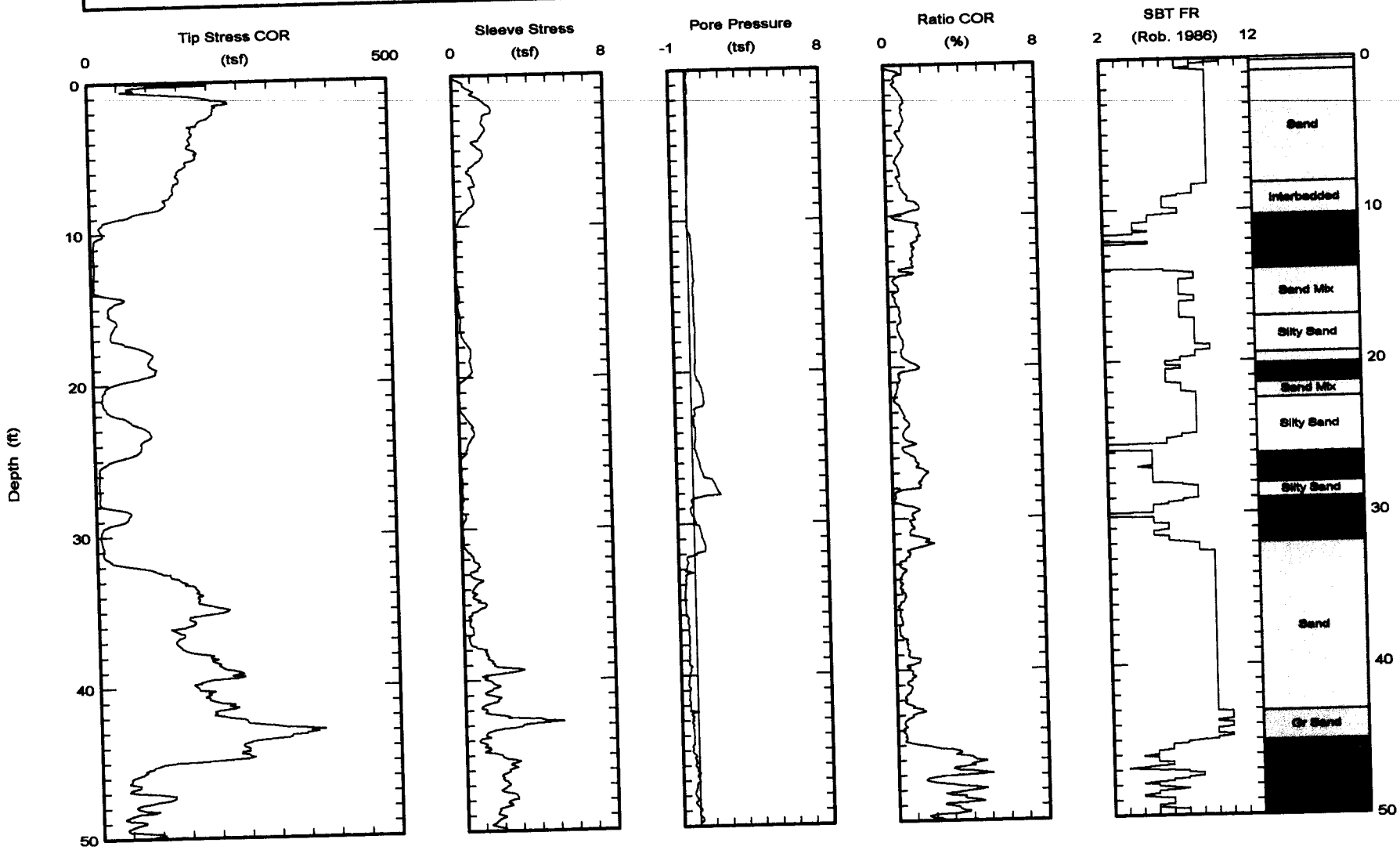
Test ID: CPT-G-5
Project: MarinaDelRey

Client: Group Delta Consultants
Job Site: Neptune Marino Apts



Maximum depth: 80.11 (ft)
Page 1 of 2

Test ID: CPT-5
File: Z08U0504C.ECP

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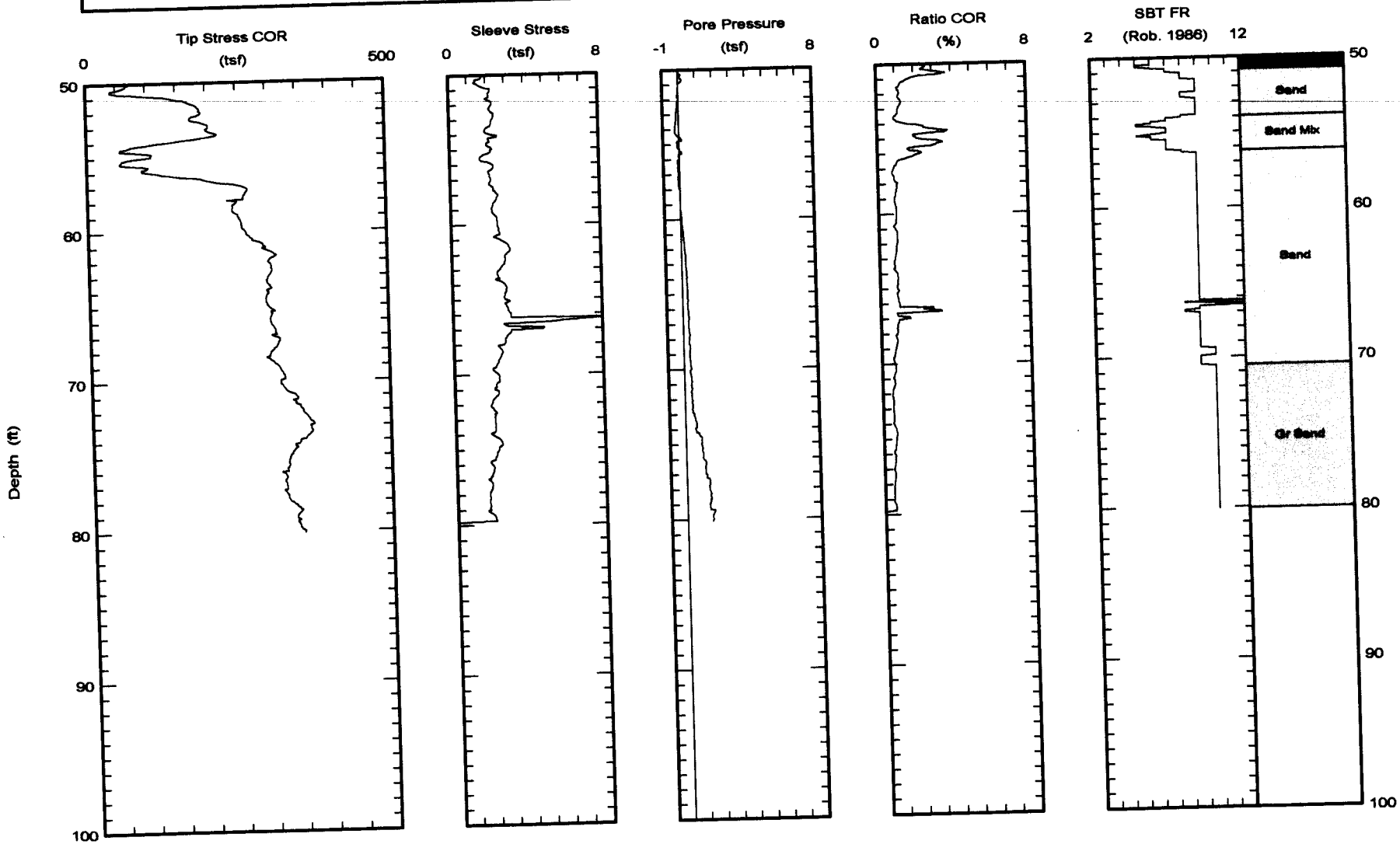
CPT Data
30 ton rig

Date: 09/Jun/2005
Test ID: CPT- G-5
Project: MarinaDelRey

Client: Group Delta Consultants
Job Site: Neptune Marino Apts



Maximum depth: 80.11 (ft)

Test ID: CPT-5
File: Z09U0504C.ECP

Boring No.: G-05

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
0.5	98	0.45	0.46	125	63	63	1.17	0.00	9	19	29	141	9E+09	50
1.5	213	1.36	0.64	125	188	188	1.30	0.16	9	41	62	148	9E+09	50
2.5	193	1.84	0.96	125	313	313	1.48	7.82	9	37	56	133	9E+09	50
3.5	171	1.62	0.95	125	438	438	1.47	7.63	9	33	50	121	9E+09	50
4.5	173	1.27	0.73	125	563	563	1.34	2.05	9	33	50	116	9E+09	47
5.5	163	1.44	0.88	125	688	688	1.47	7.34	9	31	47	109	9E+09	47
6.5	146	0.89	0.60	125	813	813	1.30	0.09	9	28	42	101	9E+09	45
7.5	135	0.97	0.72	125	938	938	1.43	5.57	9	26	39	95	9E+09	45
8.5	99	0.95	0.96	125	1063	1045	1.65	14.95	8	24	36	8.10E+01	9.00E+09	4.10E+01
9.5	23	0.31	1.39	125	1188	1107	2.20	38.28	6	9	14	9.00E+09	1.47E+00	9.00E+09
10.5	11	0.10	0.89	120	1311	1167	2.27	41.43	6	4	6	9.00E+09	6.80E-01	9.00E+09
11.5	6	0.10	1.58	110	1426	1220	2.70	59.45	1	3	4	9E+09	0.372	9E+09
12.5	6	0.09	1.35	110	1536	1268	2.64	57.28	1	3	4	9E+09	0.38	9E+09
13.5	6	0.07	1.08	110	1646	1315	2.61	55.93	1	3	4	9E+09	0.338	9E+09
14.5	39	0.16	0.42	120	1761	1368	1.61	13.49	7	12	16	38	9E+09	35
15.5	33	0.13	0.39	120	1881	1426	1.66	15.43	7	11	14	31	9E+09	33
16.5	35	0.21	0.61	120	2001	1483	1.82	22.23	7	11	14	33	9E+09	33
17.5	71	0.39	0.55	125	2124	1543	1.56	11.25	8	17	21	60	9E+09	37
18.5	97	0.71	0.73	125	2249	1606	1.61	13.60	8	23	27	71	9E+09	39
19.5	81	0.70	0.86	125	2374	1669	1.75	19.33	8	19	22	63	9E+09	39
20.5	19	0.17	0.87	120	2497	1729	2.21	38.77	6	7	8	9E+09	1.182	9E+09
21.5	20	0.07	0.35	120	2617	1786	1.90	25.55	7	7	8	8	9E+09	28
22.5	64	0.28	0.44	125	2739	1847	1.56	11.36	8	15	16	51	9E+09	35
23.5	89	0.72	0.82	125	2865	1909	1.73	18.70	8	21	22	6.30E+01	9.00E+09	3.70E+01
24.5	64	0.48	0.74	125	2990	1972	1.79	21.08	8	15	15	5.00E+01	9.00E+09	3.50E+01
25.5	13	0.12	0.95	120	3112	2032	2.44	48.69	6	5	5	9.00E+09	7.56E-01	9.00E+09
26.5	7	0.11	1.48	120	3232	2090	2.84	65.75	5	4	4	9.00E+09	3.80E-01	9.00E+09
27.5	8	0.13	1.61	120	3352	2147	2.86	66.29	5	4	4	9E+09	0.4	9E+09
28.5	50	0.10	0.19	125	3475	2207	1.47	7.58	8	12	11	38	9E+09	33
29.5	18	0.16	0.89	120	3597	2267	2.33	44.08	6	7	6	9E+09	1.103	9E+09
30.5	9	0.09	0.99	120	3718	2325	2.64	57.31	5	5	4	9.00E+09	5.00E-01	9.00E+09
31.5	20	0.33	1.60	120	3838	2383	2.54	52.87	6	8	7	9.00E+09	1.22E+00	9.00E+09
32.5	108	0.73	0.67	125	3960	2443	1.67	15.77	8	26	22	6.60E+01	9.00E+09	3.70E+01
33.5	161	0.73	0.45	125	4085	2505	1.39	3.92	9	31	26	8.10E+01	9.00E+09	3.90E+01
34.5	185	0.74	0.40	125	4210	2568	1.30	0.25	9	36	30	8.60E+01	9.00E+09	4.10E+01
35.5	165	0.67	0.40	125	4335	2631	1.34	1.99	9	32	26	81	9E+09	39
36.5	135	0.45	0.33	125	4461	2693	1.34	1.91	9	26	21	72	9E+09	39
37.5	147	0.43	0.29	125	4586	2756	1.27	0.00	9	28	22	75	9E+09	39
38.5	200	1.31	0.66	125	4711	2819	1.53	9.90	9	38	29	87	9E+09	41

Boring No.: G-05

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
39.5	199	1.84	0.93	125	4836	2881	1.70	17.18	9	38	29	86	9E+09	41
40.5	181	1.45	0.80	125	4961	2944	1.66	15.38	9	35	26	82	9E+09	39
41.5	208	1.39	0.67	125	5086	3007	1.54	10.62	9	40	29	87	9E+09	41
42.5	291	2.86	0.99	125	5211	3069	1.66	15.62	9	56	40	99	9E+09	41
43.5	286	1.50	0.53	130	5339	3134	1.36	2.84	10	46	33	98	9E+09	41
44.5	234	1.18	0.50	125	5466	3200	1.40	4.34	9	45	31	90	9E+09	41
45.5	82	2.43	2.96	125	5591	3262	2.50	51.03	6	31	21	9E+09	5.295	9E+09
46.5	54	2.08	3.88	125	5716	3325	2.74	61.28	5	26	18	9E+09	3.381	9E+09
47.5	94	2.32	2.47	120	5839	3385	2.38	46.26	7	30	20	53	9E+09	35
48.5	61	1.95	3.20	125	5962	3445	2.62	56.42	6	23	15	9E+09	3.864	9E+09
49.5	66	1.74	2.63	125	6087	3508	2.51	51.75	6	25	16	9E+09	4.218	9E+09
50.5	70	1.72	2.47	125	6212	3570	2.48	50.15	6	27	17	9E+09	4.44	9E+09
51.5	175	2.19	1.25	125	6337	3633	1.93	26.90	8	42	27	76	9E+09	37
52.5	188	2.30	1.22	125	6462	3696	1.90	25.87	8	45	28	78	9E+09	39
53.5	194	2.11	1.09	125	6587	3758	1.84	23.37	9	37	23	79	9E+09	39
54.5	88	2.19	2.47	125	6712	3821	2.43	48.30	6	34	21	9E+09	5.678	9E+09
55.5	81	1.93	2.39	125	6837	3884	2.44	48.78	6	31	19	9E+09	5.155	9E+09
56.5	188	2.20	1.17	125	6962	3946	1.90	25.60	9	36	21	77	9E+09	37
57.5	260	2.30	0.88	125	7087	4009	1.69	16.77	9	50	29	89	9E+09	39
58.5	245	2.36	0.97	125	7213	4071	1.75	19.36	9	47	27	86	9E+09	39
59.5	257	2.41	0.94	125	7338	4134	1.73	18.46	9	49	28	88	9E+09	39
60.5	277	2.53	0.91	125	7463	4197	1.70	17.35	9	53	30	91	9E+09	39
61.5	304	3.01	0.99	125	7588	4259	1.72	18.22	9	58	32	94	9E+09	41
62.5	304	2.81	0.92	125	7713	4322	1.69	16.93	9	58	32	94	9E+09	41
63.5	300	2.55	0.85	125	7838	4385	1.66	15.48	9	57	31	93	9E+09	41
64.5	298	2.87	0.96	125	7963	4447	1.72	18.29	9	57	31	92	9E+09	39
65.5	304	2.97	0.98	125	8088	4510	1.73	18.47	9	58	31	93	9E+09	39
66.5	307	4.55	1.48	125	8213	4573	1.94	27.27	8	74	39	93	9E+09	39
67.5	313	2.91	0.93	125	8338	4635	1.71	17.49	9	60	31	9.30E+01	9.00E+09	3.90E+01
68.5	304	2.54	0.84	125	8463	4698	1.66	15.71	9	58	30	9.20E+01	9.00E+09	3.90E+01
69.5	321	2.26	0.71	130	8591	4763	1.57	11.88	10	51	26	94	9E+09	39
70.5	326	2.34	0.72	130	8721	4831	1.58	12.20	10	52	26	9.40E+01	9.00E+09	3.90E+01
71.5	347	2.18	0.63	130	8851	4898	1.51	9.09	10	55	28	9.60E+01	9.00E+09	4.10E+01
72.5	364	2.11	0.58	130	8981	4966	1.46	7.10	10	58	29	9.80E+01	9.00E+09	4.10E+01
73.5	363	2.11	0.58	130	9111	5034	1.47	7.40	10	58	29	9.70E+01	9.00E+09	4.10E+01
74.5	340	2.35	0.69	130	9242	5101	1.57	11.59	10	54	27	9.40E+01	9.00E+09	3.90E+01
75.5	328	2.11	0.64	130	9372	5169	1.55	10.68	10	52	26	9.30E+01	9.00E+09	3.90E+01
76.5	322	1.95	0.60	130	9502	5237	1.53	9.82	10	51	26	9.20E+01	9.00E+09	3.90E+01
77.5	324	1.87	0.58	130	9632	5304	1.51	8.98	10	52	26	9.20E+01	9.00E+09	3.90E+01

Boring No.: G-05

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
78.5	341	1.78	0.52	130	9762	5372	1.45	6.67	10	55	28	93	9E+09	39
79.5	344	1.49	0.43	130	9892	5440	1.37	3.21	10	55	28	93	9E+09	39
80.5	353	0.00	0.00	130	10022	5507	#######	#######	10	9E+09	9E+09	94	9E+09	39

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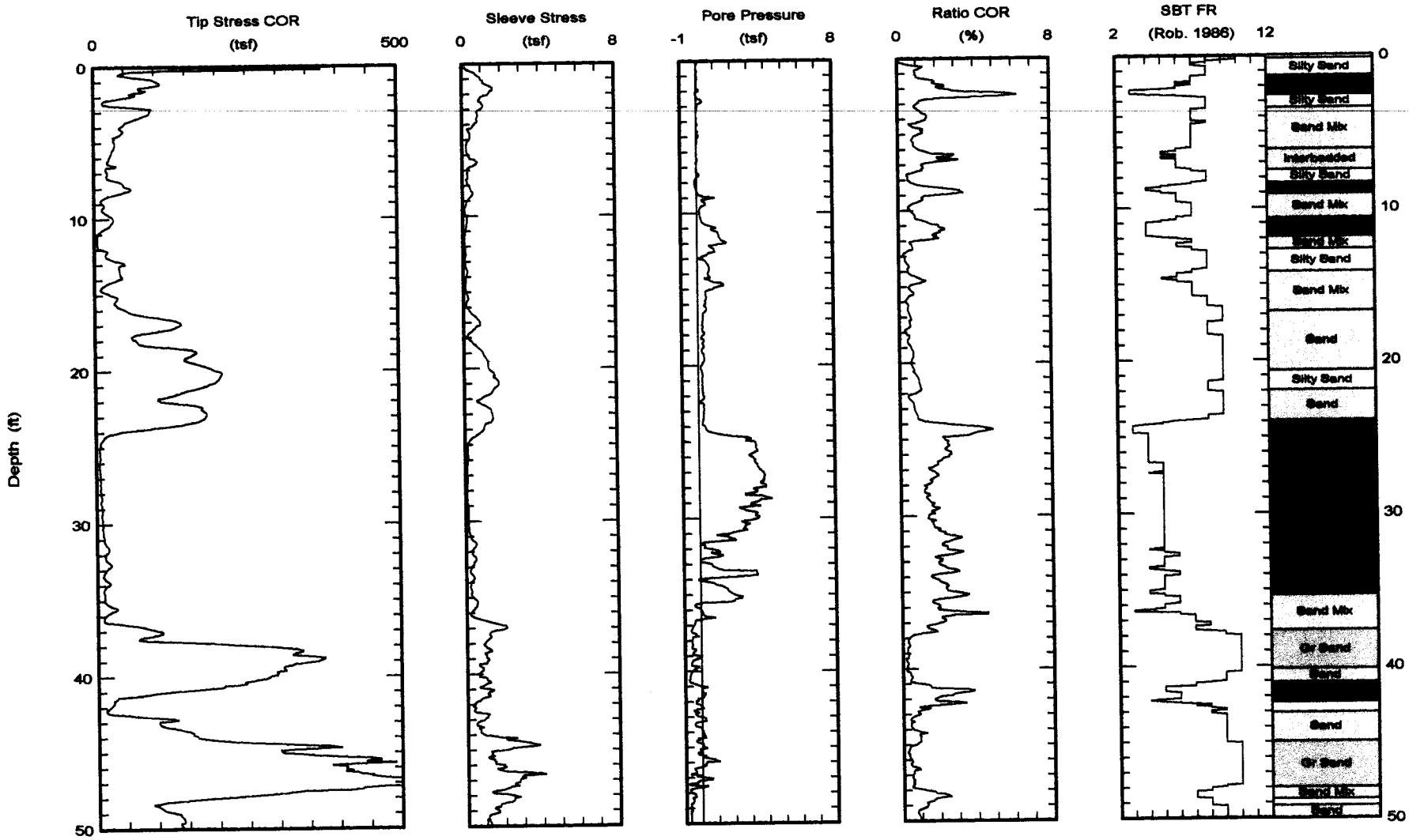
CPT Data
30 ton rig

Date: 09/Jun/2005
Test ID: CPT-G-6
Project: MarinaDelRey

Client: Group Delta Consultants
Job Site: Neptune Marino Apts



Maximum depth: 50.08 (ft)
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Test ID: CPT-6
File: Z08U0602C.ECP

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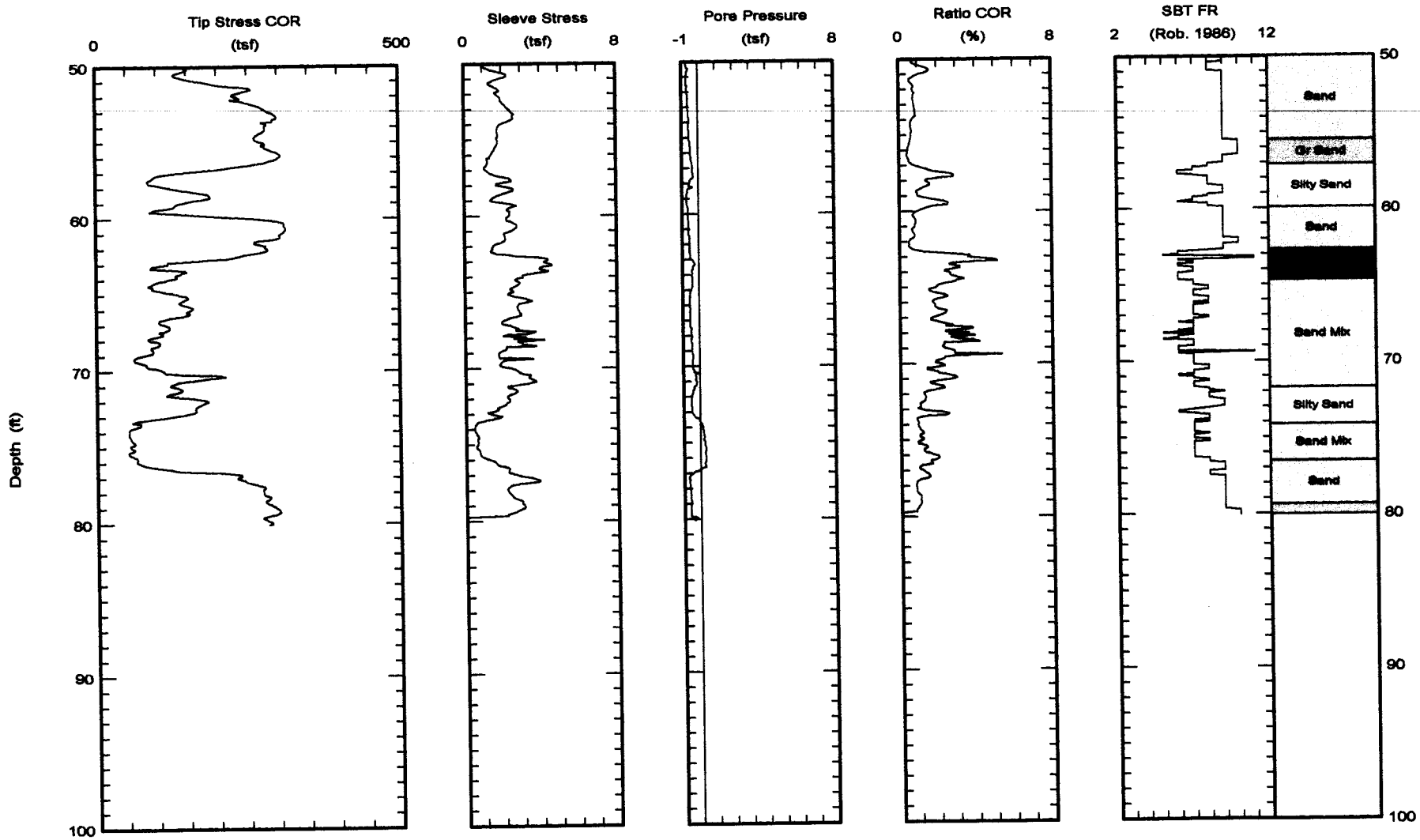
CPT Data
30 ton rig

Date: 09/Jun/2005
Test ID: CPT- G-6
Project: MarinaDelRey

Client: Group Delta Consultants
Job Site: Neptune Marino Apts



Maximum depth: 80.08 (ft)
Page 2 of 2

Test ID: CPT-6
File: Z08U0602C.ECP

Boring No.: G-06

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
0.5	91	0.49	0.54	125	63	63	1.25	0.00	8	22	33	138	9E+09	50
1.5	84	1.36	1.63	120	185	185	1.78	20.51	7	27	41	112	9E+09	50
2.5	49	1.05	2.13	125	308	308	1.99	29.59	6	19	29	9E+09	3.284	9E+09
3.5	69	0.81	1.16	125	433	433	1.66	15.58	8	17	26	86	9E+09	45
4.5	41	0.45	1.11	120	555	555	1.77	20.22	7	13	20	60	9E+09	41
5.5	32	0.28	0.87	120	675	675	1.76	19.68	7	10	15	46	9E+09	37
6.5	25	0.54	2.12	125	798	798	2.27	41.58	6	10	15	9E+09	1.66	9E+09
7.5	37	0.28	0.77	120	921	921	1.74	19.04	7	12	18	45	9E+09	37
8.5	30	0.44	1.50	125	1043	1025	2.13	35.61	6	11	17	9.00E+09	1.94E+00	9.00E+09
9.5	20	0.17	0.85	120	1166	1085	2.02	30.73	6	8	12	9.00E+09	1.31E+00	9.00E+09
10.5	22	0.22	1.01	125	1288	1145	2.08	33.47	6	8	12	9.00E+09	1.41E+00	9.00E+09
11.5	6	0.12	1.92	120	1411	1205	2.76	62.19	4	4	6	9E+09	0.366	9E+09
12.5	30	0.14	0.48	120	1531	1263	1.72	18.21	7	9	13	30	9E+09	33
13.5	43	0.19	0.45	125	1654	1323	1.59	12.69	8	10	14	43	9E+09	35
14.5	19	0.15	0.78	120	1776	1383	2.08	33.36	6	7	9	9E+09	1.227	9E+09
15.5	38	0.22	0.56	120	1896	1440	1.74	19.12	7	12	15	37	9E+09	35
16.5	105	0.56	0.53	125	2019	1501	1.43	5.94	9	20	25	75	9E+09	41
17.5	91	0.50	0.55	125	2144	1563	1.50	8.60	8	22	27	69	9E+09	39
18.5	124	0.63	0.51	125	2269	1626	1.39	4.11	9	24	28	80	9E+09	41
19.5	167	1.20	0.72	125	2394	1688	1.49	8.47	9	32	36	91	9E+09	43
20.5	201	1.59	0.79	125	2519	1751	1.51	9.33	9	39	43	97	9E+09	43
21.5	135	1.43	1.06	125	2644	1814	1.75	19.29	8	32	35	81	9E+09	41
22.5	168	1.11	0.66	125	2769	1876	1.47	7.63	9	32	34	89	9E+09	41
23.5	130	1.30	1.00	125	2894	1939	1.74	19.00	8	31	32	7.80E+01	9.00E+09	3.90E+01
24.5	14	0.51	3.68	120	3017	1999	2.96	70.66	4	9	9	9.00E+09	7.98E-01	9.00E+09
25.5	7	0.18	2.55	120	3137	2057	3.07	75.51	4	4	4	9.00E+09	3.15E-01	9.00E+09
26.5	7	0.13	2.00	120	3257	2114	3.01	72.79	4	4	4	9.00E+09	2.89E-01	9.00E+09
27.5	8	0.13	1.74	120	3377	2172	2.91	68.49	5	4	4	9E+09	0.347	9E+09
28.5	9	0.13	1.37	120	3497	2230	2.76	62.14	5	4	4	9E+09	0.444	9E+09
29.5	10	0.16	1.69	120	3617	2287	2.82	64.73	5	5	5	9E+09	0.486	9E+09
30.5	11	0.19	1.72	120	3737	2345	2.79	63.39	5	5	4	9.00E+09	5.70E-01	9.00E+09
31.5	17	0.42	2.54	120	3857	2402	2.80	64.04	5	8	7	9.00E+09	9.62E-01	9.00E+09
32.5	18	0.44	2.41	120	3977	2460	2.76	62.20	5	9	8	9.00E+09	1.06E+00	9.00E+09
33.5	15	0.32	2.16	120	4097	2518	2.79	63.47	5	7	6	9.00E+09	8.34E-01	9.00E+09
34.5	13	0.28	2.19	120	4218	2575	2.87	66.82	5	6	5	9.00E+09	6.82E-01	9.00E+09
35.5	21	0.48	2.22	125	4340	2635	2.69	59.32	6	8	6	9E+09	1.27	9E+09
36.5	44	1.05	2.39	125	4465	2698	2.51	51.69	6	17	14	9E+09	2.764	9E+09
37.5	127	1.31	1.04	125	4590	2761	1.85	23.61	8	30	23	69	9E+09	37
38.5	337	1.06	0.31	130	4718	2826	1.05	0.00	10	54	41	107	9E+09	43

Boring No.: G-06

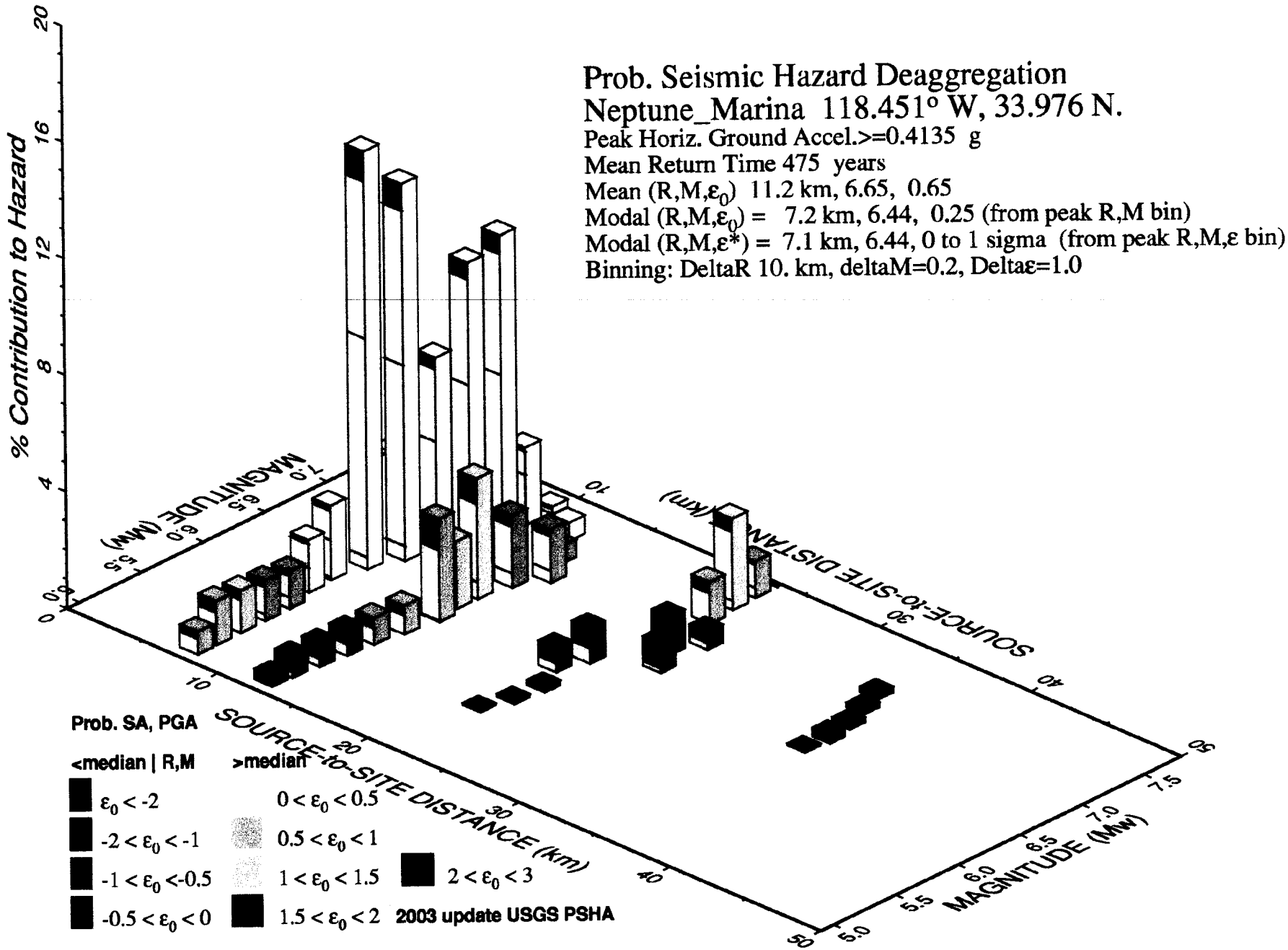
Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
39.5	314	0.87	0.28	130	4848	2893	1.03	0.00	10	50	38	103	9E+09	43
40.5	229	0.93	0.41	125	4976	2959	1.28	0.00	9	44	33	91	9E+09	41
41.5	43	0.90	2.09	125	5101	3021	2.49	50.76	6	16	12	9E+09	2.692	9E+09
42.5	59	0.67	1.13	120	5223	3081	2.13	35.61	7	19	14	38	9E+09	31
43.5	130	0.65	0.50	125	5346	3142	1.56	11.23	9	25	18	68	9E+09	37
44.5	277	2.45	0.89	125	5471	3204	1.63	14.12	9	53	37	96	9E+09	41
45.5	410	1.38	0.34	130	5599	3269	1.07	0.00	10	65	45	111	9E+09	43
46.5	461	2.59	0.56	130	5729	3337	1.30	0.46	10	74	50	115	9E+09	43
47.5	392	2.13	0.54	130	5859	3405	1.32	1.27	10	63	42	109	9E+09	43
48.5	119	2.01	1.69	120	5984	3467	2.15	36.40	7	38	25	62	9E+09	35
49.5	137	1.25	0.91	125	6106	3527	1.84	22.98	9	26	17	67	9E+09	37
50.5	145	1.63	1.12	125	6232	3590	1.92	26.57	8	35	22	69	9E+09	37
51.5	228	1.61	0.71	125	6357	3653	1.59	12.68	9	44	28	86	9E+09	39
52.5	254	2.02	0.80	125	6482	3715	1.63	14.19	9	49	30	90	9E+09	41
53.5	290	2.47	0.85	125	6607	3778	1.63	14.39	9	56	34	95	9E+09	41
54.5	271	1.80	0.66	125	6732	3841	1.53	10.13	9	52	31	92	9E+09	41
55.5	290	1.66	0.57	130	6859	3906	1.45	6.70	10	46	27	94	9E+09	41
56.5	242	1.24	0.51	125	6987	3971	1.45	6.67	9	46	27	87	9E+09	39
57.5	100	1.85	1.85	120	7110	4031	2.28	41.81	7	32	19	52	9E+09	33
58.5	167	2.00	1.20	125	7232	4091	1.95	27.76	8	40	23	71	9E+09	37
59.5	147	2.34	1.59	125	7357	4154	2.12	34.96	8	35	20	66	9E+09	37
60.5	303	2.51	0.83	125	7482	4216	1.63	14.45	9	58	33	94	9E+09	41
61.5	285	2.04	0.71	125	7608	4279	1.58	12.25	9	55	31	91	9E+09	39
62.5	221	2.47	1.12	125	7733	4342	1.86	24.00	9	42	23	81	9E+09	39
63.5	126	3.96	3.14	125	7858	4404	2.50	50.96	6	48	26	9E+09	8.158	9E+09
64.5	103	2.71	2.62	125	7983	4467	2.46	49.47	6	40	22	9E+09	6.633	9E+09
65.5	148	2.86	1.93	120	8105	4527	2.23	39.56	7	47	25	65	9E+09	35
66.5	128	2.65	2.06	120	8225	4585	2.30	42.63	7	41	22	59	9E+09	35
67.5	106	2.71	2.55	120	8345	4642	2.45	49.08	7	34	18	5.10E+01	9.00E+09	3.30E+01
68.5	94	2.65	2.83	125	8468	4702	2.53	52.64	6	36	19	9.00E+09	5.98E+00	9.00E+09
69.5	78	2.04	2.63	125	8593	4765	2.56	53.56	6	30	15	9E+09	4.892	9E+09
70.5	152	3.21	2.11	120	8716	4825	2.28	41.85	7	49	25	6.40E+01	9.00E+09	3.50E+01
71.5	143	2.54	1.78	120	8836	4883	2.22	39.15	7	46	23	6.20E+01	9.00E+09	3.50E+01
72.5	161	1.89	1.17	125	8958	4943	2.00	29.79	8	39	20	6.60E+01	9.00E+09	3.50E+01
73.5	69	0.96	1.39	120	9081	5003	2.33	43.84	7	22	11	3.30E+01	9.00E+09	2.80E+01
74.5	56	0.60	1.07	120	9201	5061	2.29	42.28	7	18	9	2.50E+01	9.00E+09	2.80E+01
75.5	60	0.76	1.26	120	9321	5118	2.34	44.27	7	19	10	2.70E+01	9.00E+09	2.80E+01
76.5	151	2.00	1.33	125	9444	5178	2.08	33.46	8	36	18	6.30E+01	9.00E+09	3.50E+01
77.5	262	2.90	1.11	125	9569	5241	1.86	24.03	9	50	25	8.40E+01	9.00E+09	3.90E+01

Boring No.: G-06

Depth (ft)	Qt(avg) (TSF)	Fs(avg) (TSF)	Rf (%)	Gamma (pcf)	OS(avg) (psf)	EOS(avg) (psf)	Ic index	FC (%)	Rf Zone (zone #)	Spt N (blow/ft)	Spt N1 (blow/ft)	Dr (%)	Su (TSF)	Phi (degree)
78.5	282	2.61	0.92	125	9694	5304	1.76	19.71	9	54	27	86	9E+09	39
79.5	289	2.03	0.70	125	9819	5366	1.63	14.20	9	55	28	87	9E+09	39
80.5	285	0.00	0.00	130	9946	5432	#######	#######	10	9E+09	9E+09	86	9E+09	39

APPENDIX B
Seismicity

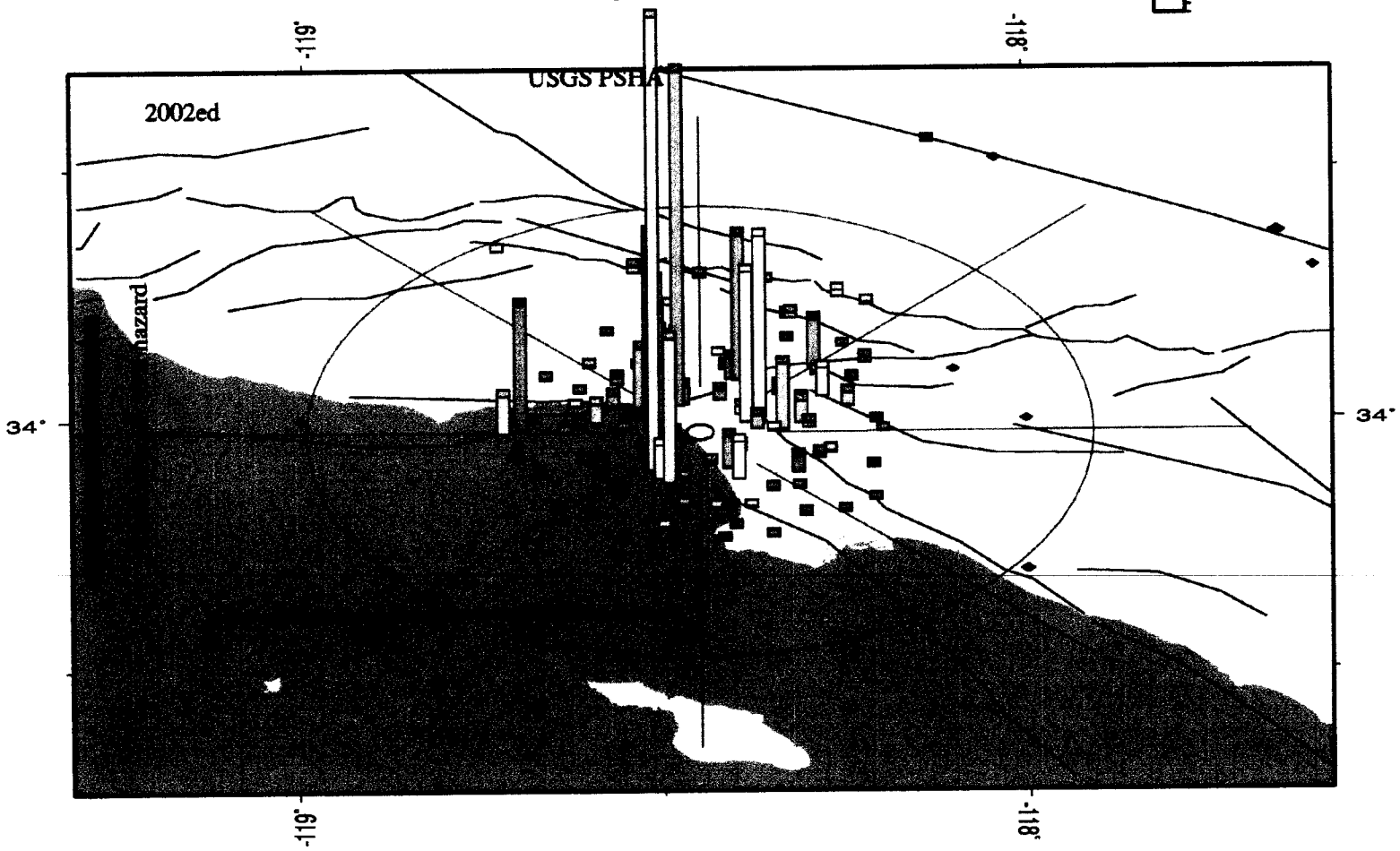
GROUP DELTA CONSULTANTS



GMT Jul 26 15:49 Distance (R), magnitude (M), epsilon (E0,E) deaggregation for a site on ROCK avg Vs=760 m/s top 30 m USGS CGHT PSHA2002v3 UPDATE Bins with lt 0.05% contrib. omitted

Neptune_Marina Geographic Deagg. Seismic Hazard
for 0.00-s Spectral Accel, 0.4135 g

PGA Exceedance Return Time: 475. years
Max. significant source distance 71. km.
Red lines represent Quaternary fault locations
Gridded-source hazard accum. in 5° intervals
Rock site. Average Vs=760 m/s top 30 m



GMT 2005 Jul 26 15:49:25 Site Coords:-118.451 33.9760 (yellow disk). Max annual ExcdRate .3729E-03 (column height prop. to ExRate). Red diamonds: historical earthquakes, M>6

APPENDIX C
Liquefaction Analysis

GROUP DELTA CONSULTANTS

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	G-01
Ground Surf. Elevation	7.5 ft
GWT Depth During Testing, Z_w	8.2 ft
GWT Depth For Design, Z_{wd}	2.5 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_w	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

REFERENCES

+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ $CSR = 0.65\ A_{max}\ (\sigma_v/\sigma_v')\ r_d$

+++ $FS = (CRR_{7.5}/CSR)\ MSF\ K_\sigma\ K_\alpha$ -->>where K_α =1.0 and MSF 1.15

* S_r value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis asssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils = 15.00 feet

Earthquake-Induced Settlements:

- Liquefaction-Induced Settlement	2.77 inches	<-- Saturated Sands
- Seismic Compaction Settlement =	0.01 inches	<-- Dry or Unsaturated Sands
Total:	2.78 inches	

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +														RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) $\sigma_{v'}$ (psf)	Effective Vert. Stress (Testing) $\sigma_{v'}$ (psf)	SPT Stress Correction Factor C_N	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.5	80.408	0.273	0.34	sand to silty sand	6.5	20	58	58	58	1.700	34.2	38.3	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	0.007	0.006	0.001
1.5	71.877	0.528	0.734	sand to silty sand	5.5	18	173	173	173	1.700	30.5	34.5	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.016	0.015	0.002
2.5	59.685	0.476	0.797	sand to silty sand	4.5	15	288	288	288	1.700	25.4	29.1	0.994	1.000	0.323	0.414	1.475	NO	N/A	N/A	N/A	N/A	0.089	0.011
3.5	32.767	0.399	1.215	silty sand to sandy silt	3.5	11	403	340	403	1.700	18.6	27.3	0.992	1.000	0.381	0.346	1.044	YES	2.8	21.4	1,200	N/A	0.560	0.067
4.5	27.454	0.286	1.042	silty sand to sandy silt	2.5	9	518	393	518	1.700	15.6	23.7	0.990	1.000	0.424	0.268	0.727	YES	2.8	18.4	1,036	N/A	1.235	0.148
5.5	32.892	0.452	1.375	silty sand to sandy silt	1.5	11	633	445	633	1.700	18.6	27.4	0.987	1.000	0.456	0.349	0.881	YES	2.8	21.4	1,200	N/A	0.945	0.113
6.5	70.554	0.985	1.397	silty sand to sandy silt	0.5	24	748	498	748	1.636	38.5	51.2	0.985	1.000	0.481	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
7.5	42.2	0.335	0.794	silty sand to sandy silt	-0.5	14	863	551	863	1.523	21.4	30.7	0.983	1.000	0.500	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.567	0.068
8.5	17.438	0.236	1.354	sandy silt to clayey silt	-1.5	7	978	603	959	1.444	N/A	N/A	0.980	N/A	0.516	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
9.5	9.629	0.153	1.582	clayey silt to silty clay	-2.5	5	1,093	656	1,011	1.406	N/A	N/A	0.978	N/A	0.530	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
10.5	5.985	0.111	1.832	silty clay to clay	-3.5	4	1,208	708	1,064	1.371	N/A	N/A	0.976	N/A	0.540	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
11.5	20.991	0.108	0.514	silty sand to sandy silt	-4.5	7	1,323	761	1,117	1.338	9.4	16.2	0.973	1.000	0.550	0.173	0.361	YES	2.8	12.2	449	N/A	1.828	0.219
12.5	19.38	0.096	0.494	silty sand to sandy silt	-5.5	6	1,438	814	1,169	1.308	8.4	15.1	0.971	1.000	0.558	0.161	0.333	YES	2.8	11.2	388	N/A	1.907	0.229
13.5	27.308	0.159	0.582	silty sand to sandy silt	-6.5	9	1,553	866	1,222	1.279	11.6	19.0	0.969	1.000	0.564	0.203	0.414	YES	2.8	14.4	645	N/A	1.630	0.196
14.5	88.308	0.483	0.547	sand to silty sand	-7.5	22	1,668	919	1,274	1.253	27.7	31.5	0.966	1.000	0.570	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.555	0.067
15.5	106.042	0.376	0.355	sand	-8.5	21	1,783	971	1,327	1.228	26.0	26.0	0.964	1.000	0.575	0.314	0.628	YES	0.0	26.0	1,200	N/A	1.119	0.134
16.5	77.8	0.45	0.578	sand to silty sand	-9.5	19	1,898	1,024	1,380	1.204	23.4	27.0	0.962	1.000	0.579	0.340	0.674	YES	1.3	24.8	1,200	N/A	1.047	0.126
17.5	23.292	0.162	0.693	silty sand to sandy silt	-10.5	8	2,013	1,077	1,432	1.182	9.2	16.0	0.959	1.000	0.583	0.170	0.336	YES	2.8	12.0	434	N/A	1.844	0.221
18.5	41.042	0.268	0.654	silty sand to sandy silt	-11.5	14	2,128	1,129	1,485	1.161	15.9	24.1	0.957	1.000	0.586	0.274	0.538	YES	2.8	18.7	1,068	N/A	1.263	0.152
19.5	165.958	1.017	0.613	sand	-12.5	33	2,243	1,182	1,537	1.141	37.9	37.9	0.955	1.000	0.589	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.041	0.005
20.5	168.546	1.32	0.783	sand	-13.5	34	2,358	1,234	1,590	1.122	37.8	37.8	0.952	1.000	0.591	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.042	0.005
21.5	161.908	1.342	0.829	sand	-14.5	32	2,473	1,287	1,643	1.103	35.7	35.7	0.950	1.000	0.593	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.082	0.010
22.5	69.767	1.043	1.493	silty sand to sandy silt	-15.5	23	2,588	1,340	1,695	1.086	25.3	35.3	0.948	1.000	0.595	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.090	0.011
23.5	6.662	0.128	1.895	silty clay to clay	-16.5	4	2,703	1,392	1,748	1.070	N/A	N/A	0.945	N/A	0.596	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
24.5	17.477	0.163	0.925	sandy silt to clayey silt	-17.5	7	2,818	1,445	1,800	1.054	N/A	N/A	0.943	N/A	0.598	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
25.5	12.738	0.171	1.315	sandy silt to clayey silt	-18.5	5	2,933	1,497	1,853	1.039	N/A	N/A	0.941	N/A	0.599	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
26.5	19.538	0.367	1.853	sandy silt to clayey silt	-19.5	8	3,048	1,550	1,906	1.024	N/A	N/A	0.938	N/A	0.600	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
27.5	35.885	0.581	1.618	silty sand to sandy silt	-20.5	12	3,163	1,603	1,958	1.011	12.0	19.4	0.936	1.000	0.600	0.208	0.399	YES	2.8	14.8	682	N/A	1.597	0.192
28.5	66.646	0.528	0.794	sand to silty sand	-21.5	17	3,278	1,655	2,011	0.997	16.6	19.9	0.934	1.000	0.601	0.214	0.410	YES	1.3	18.0	995	N/A	1.562	0.187
29.5	30.938	0.405	1.314	silty sand to sandy silt	-22.5	10	3,393	1,708	2,063	0.985	10.2	17.2	0.931	1.000	0.601	0.183	0.350	YES	2.8	13.0	514	N/A	1.759	0.211
30.5	13.992	0.283	2.028	clayey silt to silty clay	-23.5	7	3,508	1,760	2,116	0.972	N/A	N/A	0.926	N/A	0.599	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31.5	18.085	0.402	2.228	clayey silt to silty clay	-24.5	9	3,623	1,813	2,169	0.960	N/A	N/A	0.918	N/A	0.596	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
32.5	20.346	0.446	2.193	sandy silt to clayey silt	-25.5	8	3,738	1,866	2,221	0.949	N/A	N/A	0.909	N/A	0.592	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
33.5	22.342	0.609	2.725	clayey silt to silty clay	-26.5	11	3,853	1,918	2,274	0.938	N/A	N/A	0.901	N/A	0.588	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
34.5	50.158	1.093	2.18	sandy silt to clayey silt	-27.5	20	3,968	1,971	2,326	0.927	N/A	N/A	0.893	N/A	0.584	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
35.5	109.254	0.415	0.381	sand	-28.5	22	4,083	2,023	2,379	0.917	20.0	20.0	0.885	0.996	0.580	0.216	0.426	YES	0.0	20.0	1,200	N/A	1.553	0.186
36.5	179.383	0.878	0.489	sand	-29.5	36	4,198	2,076	2,432	0.907	32.5	32.5	0.877	0.985	0.576	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.369	0.044
37.5	338.792	3.477	1.026	sand	-30.5	68	4,313	2,129	2,484	0.897	60.8	60.8	0.869	0.975	0.572	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
38.5	327.217	3.053	0.933	sand	-31.5	65	4,428	2,181	2,537	0.888	58.1	58.1	0.861	0.966	0.568	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
39.5	380.546	1.072	0.282	gravelly sand to sand	-32.5	63	4,543	2,234	2,589	0.879	55.7	55.7	0.852	0.957	0.563	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
40.5	452.885	1.347	0.297	gravelly sand to sand	-33.5	75	4,658	2,286	2,642	0.870	65.7	65.7	0.844	0.948	0.559	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
41.499	432.3	1.288	0.298	gravelly sand to sand	-34.5	72	4,772	2,339	2,695	0.862	62.1	62.1	0.836	0.939	0.555	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
42.499	326.254	3.106	0.952	sand	-35.5	65	4,887	2,391	2,747	0.853	55.7	55.7	0.828	0.931	0.550	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.029	0.004
43.499	226.717	1.601	0.706	sand	-36.5	45	5,002	2,444	2,800	0.845	38.3	38.3	0.820	0.923	0.545	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.075	0.009
44.499	151.231	2.524	1.669	sand to silty sand	-37.5	38	5,117	2,497	2,852	0.837	31.7	35.7	0.812	0.915	0.541	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.023	0.003
45.499	166.392	2.572	1.546	sand to silty sand	-38.5	42	5,232	2,549	2,905	0.830	34.5	38.7	0.804	0.908	0.536	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
46.499	247.3	1.14	0.461	sand	-39.5	49	5,347	2,602	2,958	0.822	40.7	40.7	0.795	0.900	0.531	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.084	0.010
47.499	214.691	0.785	0.366	sand	-40.5	43	5,462	2,654	3,010	0.815	35.0	35.0	0.787	0.893	0.527	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.097	0.012
48.499	211.083	0.689	0.327	sand	-41.5	42	5,577	2,707	3,063	0.808	34.1	34.1	0.779	0.886	0.522	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.157	0.139
49.499	158.883	1.741	1.096	sand	-42.5	32	5,692	2,760	3,115	0.801	25.5	25.5	0.771	0.885	0.517	0.301	0.593	YES	0.0	25.5	1,200	N/A	1.028	0.003
50.499	171.727	2.79	1.626	sand to silty sand	-43.5	43	5,807	2,812	3,168	0.795	34.1	38.3	0.763	0.873	0.512	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.028	0.003

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	G-02
Ground Surf. Elevation	10.0 ft
GWT Depth During Testing, Z_w	8.2 ft
GWT Depth For Design, Z_{wd}	5.0 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_{eq}	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

REFERENCES

\+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ $CSR = 0.65\ A_{max}\ (\sigma_v/\sigma_v')\ r_d$

+++ $FS = (CRR_{7.5}/CSR)\ MSF\ K_\sigma\ K_\alpha$ ---,,where K_α =1.0 and MSF 1.15

* S_v value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis asssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils =	8.00 feet	
Earthquake-Induced Settlements:		
- Liquefaction-Induced Settlement =	1.43 inches	<— Saturated Sands
- Seismic Compaction Settlement =	0.00 inches	<— Dry or Unsaturated Sands
Total:	1.43 inches	

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +															RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) $\sigma_{v'}$ (psf)	Effective Vert. Stress (Testing) $\sigma_{v'}$ (psf)	SPT Stress Correction Factor C_n	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy ?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.5	92.785	0.216	0.233	sand	9.0	19	58	58	58	1.700	31.5	31.5	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	0.008	0.008	0.001
1.5	119.275	0.675	0.566	sand	8.0	24	173	173	173	1.700	40.6	40.6	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.014	0.011	0.001
2.5	213.5	1.097	0.514	sand	7.0	43	288	288	288	1.700	72.6	72.6	0.994	N/A	0.323	N/A	N/A	NO	N/A	N/A	N/A	0.014	0.005	0.000
3.5	246.092	1.598	0.649	sand	6.0	49	403	403	403	1.700	83.7	83.7	0.992	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.016	0.005	0.000
4.5	223.969	1.812	0.809	sand	5.0	45	518	518	518	1.700	76.1	76.1	0.990	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.019	0.007	0.000
5.5	209.15	1.613	0.771	sand	4.0	42	633	601	633	1.700	71.1	71.1	0.987	1.000	0.337	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
6.5	147.367	1.215	0.824	sand	3.0	29	748	654	748	1.636	48.2	48.2	0.985	1.000	0.366	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
7.5	107.771	0.989	0.917	sand to silty sand	2.0	27	863	707	863	1.523	41.0	45.5	0.983	1.000	0.390	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
8.5	115.967	1.017	0.878	sand to silty sand	1.0	29	978	759	959	1.444	41.9	46.4	0.980	1.000	0.410	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.004	0.001
9.5	100.808	0.863	0.856	sand to silty sand	0.0	25	1,093	812	1,011	1.406	35.4	39.6	0.978	1.000	0.428	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.146	0.138
10.5	36.483	0.617	1.694	silty sand to sandy silt	-1.0	12	1,208	864	1,064	1.371	16.7	25.0	0.976	1.000	0.443	0.292	0.758	YES	2.8	19.5	1,147	N/A	N/A	N/A
11.5	7.785	0.083	1.066	clayey silt to silty clay	-2.0	4	1,323	917	1,117	1.338	N/A	N/A	0.973	N/A	0.456	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
12.5	6.723	0.082	1.211	sensitive fine grained	-3.0	3	1,438	970	1,169	1.308	N/A	N/A	0.971	N/A	0.468	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
13.5	8.058	0.112	1.392	clayey silt to silty clay	-4.0	4	1,553	1,022	1,222	1.279	N/A	N/A	0.969	N/A	0.478	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
14.5	14.143	0.069	0.488	sandy silt to clayey silt	-5.0	6	1,668	1,075	1,274	1.253	N/A	N/A	0.966	N/A	0.487	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
15.5	16.492	0.115	0.698	sandy silt to clayey silt	-6.0	7	1,783	1,127	1,327	1.228	N/A	N/A	0.964	N/A	0.495	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.573	0.069
16.5	89.362	0.475	0.532	sand to silty sand	-7.0	22	1,898	1,180	1,380	1.204	26.9	30.7	0.962	1.000	0.503	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.027	0.003
17.5	115.692	0.882	0.763	sand to silty sand	-8.0	29	2,013	1,233	1,432	1.182	34.2	38.3	0.959	1.000	0.509	N/A	N/A	NO	N/A	N/A	N/A	N/A	1.202	0.144
18.5	73.477	0.447	0.608	sand to silty sand	-9.0	18	2,128	1,285	1,485	1.161	21.3	24.8	0.957	1.000	0.515	0.289	0.645	YES	1.3	22.7	1,200	N/A	1.749	0.210
19.5	26.975	0.124	0.46	silty sand to sandy silt	-10.0	9	2,243	1,338	1,537	1.141	10.3	17.3	0.955	1.000	0.520	0.184	0.407	YES	2.8	13.1	523	N/A	0.785	0.094
20.5	130.708	0.682	0.521	sand	-11.0	26	2,358	1,390	1,590	1.122	29.3	29.3	0.952	1.000	0.525	0.426	0.934	YES	0.0	29.3	1,200	N/A	0.000	0.000
21.5	225.008	2.022	0.898	sand	-12.0	45	2,473	1,443	1,643	1.103	49.7	49.7	0.950	1.000	0.529	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
22.5	208.862	2.259	1.081	sand	-13.0	42	2,588	1,496	1,695	1.086	45.4	45.4	0.948	1.000	0.533	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
23.5	191.883	1.842	0.96	sand	-14.0	38	2,703	1,548	1,748	1.070	41.1	41.1	0.945	1.000	0.536	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.106	0.013
24.5	114.521	0.958	0.836	sand to silty sand	-15.0	29	2,818	1,601	1,800	1.054	30.2	34.1	0.943	1.000	0.539	N/A	N/A	NO	N/A	N/A	N/A	N/A	1.416	0.170
25.5	40.731	0.252	0.617	silty sand to sandy silt	-16.0	14	2,933	1,653	1,853	1.039	14.1	21.9	0.941	1.000	0.542	0.241	0.511	YES	2.8	16.9	891	N/A	N/A	N/A
26.5	16.115	0.131	0.809	sandy silt to clayey silt	-17.0	6	3,048	1,706	1,906	1.024	N/A	N/A	0.938	N/A	0.545	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
27.5	13.95	0.136	0.962	sandy silt to clayey silt	-18.0	6	3,163	1,759	1,958	1.011	N/A	N/A	0.936	N/A	0.547	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
28.5	20.964	0.072	0.34	silty sand to sandy silt	-19.0	7	3,278	1,811	2,011	0.997	7.0	13.4	0.934	1.000	0.549	0.144	0.302	YES	2.8	9.8	298	N/A	2.075	0.249
29.5	9.125	0.084	0.903	clayey silt to silty clay	-20.0	5	3,393	1,864	2,063	0.985	N/A	N/A	0.931	N/A	0.551	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
30.5	10.421	0.144	1.345	clayey silt to silty clay	-21.0	5	3,508	1,916	2,116	0.972	N/A	N/A	0.926	N/A	0.551	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31.5	11.417	0.148	1.272	clayey silt to silty clay	-22.0	6	3,623	1,969	2,169	0.960	N/A	N/A	0.918	N/A	0.549	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
32.5	12.4	0.2	1.577	clayey silt to silty clay	-23.0	6	3,738	2,022	2,221	0.949	N/A	N/A	0.909	N/A	0.546	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
33.5	12.162	0.272	2.176	clayey silt to silty clay	-24.0	6	3,853	2,074	2,274	0.938	N/A	N/A	0.901	N/A	0.544	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
34.5	21.075	0.344	1.625	sandy silt to clayey silt	-25.0	8	3,968	2,127	2,326	0.927	N/A	N/A	0.893	N/A	0.542	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
35.5	12.177	0.212	1.727	clayey silt to silty clay	-26.0	6	4,083	2,179	2,379	0.917	N/A	N/A	0.885	N/A	0.539	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
36.5	25.642	0.579	2.246	sandy silt to clayey silt	-27.0	10	4,198	2,232	2,432	0.907	N/A	N/A	0.877	N/A	0.536	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
37.5	17.315	0.301	1.726	sandy silt to clayey silt	-28.0	7	4,313	2,285	2,484	0.897	N/A	N/A	0.869	N/A	0.533	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
38.5	22.754	0.423	1.844	sandy silt to clayey silt	-29.0	9	4,428	2,337	2,537	0.888	N/A	N/A	0.861	N/A	0.530	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
39.5	34.142	0.936	2.736	sandy silt to clayey silt	-30.0	14	4,543	2,390	2,589	0.879	N/A	N/A	0.852	N/A	0.527	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
40.5	197.354	2.674	1.355	sand to silty sand	-31.0	49	4,658	2,442	2,642	0.870	42.9	47.5	0.844	0.923	0.523	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
41.499	421.885	5.822	1.38	sand	-32.0	84	4,772	2,495	2,695	0.862	72.7	72.7	0.836	0.915	0.520	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
42.499	326.031	1.735	0.532	gravelly sand to sand	-33.0	54	4,887	2,547	2,747	0.853	46.4	46.4	0.828	0.908	0.516	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
43.499	317.907	2.083	0.655	gravelly sand to sand	-34.0	53	5,002	2,600	2,800	0.845	44.8	44.8	0.820	0.900	0.513	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
44.499	271.315	2.04	0.752	sand	-35.0	54	5,117	2,653	2,852	0.837	45.4	45.4	0.812	0.893	0.509	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.084	0.010
45.499	209.315	2.253	1.077	sand	-36.0	42	5,232	2,705	2,905	0.830	34.7	34.7	0.804	0.886	0.505	N/A	N/A	NO	N/A	N/A	N/A	N/A	1.174	0.141
46.499	153.133	1.23	0.804	sand	-37.0	31	5,347	2,758	2,958	0.822	25.2	25.2	0.795	0.886	0.501	0.296	0.601	YES	0.0	25.2	1,200	N/A	1.034	0.124
47.499	115.175	0.977	0.849	sand to silty sand	-38.0	29	5,462	2,810	3,010	0.815	23.5	27.1	0.787	0.884	0.497	0.341	0.697	YES	1.3	24.8	1,200	N/A	0.522	0.063
48.499	80.254	1.174	1.464	silty sand to sandy silt	-39.0	27	5,577	2,863	3,063	0.808	21.6	30.9	0.779	0.882	0.493	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
49.499	56.308	1.474	2.622	sandy silt to clayey silt	-40.0	23	5,692	2,916	3,115	0.801	N/A	N/A	0.771	N/A	0.489	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
50.499	41.054	0.956	2.333	sandy silt to clayey silt	-41.0	16	5,807	2,968	3,168	0.795	N/A	N/A	0.763	N/A	0.485	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	G-03
Ground Surf. Elevation	15.0 ft
GWT Depth During Testing, Z_w	8.2 ft
GWT Depth For Design, Z_{wd}	10.0 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_{w}	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

REFERENCES

+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ CSR = 0.65 A_{max} (σ_v/σ_v') r_d

+++ FS = $(CRR_{7.5}/CSR)$ MSF K_σ K_α -->>where K_α =1.0 and MSF 1.15

* S_t value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis asssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils = 20.00 feet

Earthquake-Induced Settlements:

- Liquefaction-Induced Settlement	3.20 inches	<-- Saturated Sands
- Seismic Compaction Settlement =	0.02 inches	<-- Dry or Unsaturated Sands
Total:	3.21 inches	

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +															RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) $\sigma_{v'}$ (psf)	Effective Vert. Stress (Testing) $\sigma_{v'}$ (psf)	SPT Stress Correction Factor C_R	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy ?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.5	108.531	0.215	0.198	sand	14.0	22	58	58	58	1.700	36.9	36.9	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	0.007	0.006	0.001
1.5	160.071	0.903	0.564	sand	13.0	32	173	173	173	1.700	54.4	54.4	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.012	0.007	0.000
2.5	179.215	0.874	0.488	sand	12.0	36	288	288	288	1.700	60.9	60.9	0.994	N/A	0.323	N/A	N/A	NO	N/A	N/A	N/A	0.016	0.007	0.000
3.5	200.638	1.141	0.569	sand	11.0	40	403	403	403	1.700	68.2	68.2	0.992	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.018	0.007	0.000
4.5	146.262	0.96	0.656	sand	10.0	29	518	518	518	1.700	49.7	49.7	0.990	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.024	0.015	0.002
5.5	124.331	0.841	0.676	sand	9.0	25	633	633	633	1.700	42.3	42.3	0.987	N/A	0.321	N/A	N/A	NO	N/A	N/A	N/A	0.029	0.021	0.003
6.5	133.508	0.829	0.621	sand	8.0	27	748	748	748	1.636	43.7	43.7	0.985	N/A	0.320	N/A	N/A	NO	N/A	N/A	N/A	0.031	0.022	0.003
7.5	97.254	0.939	0.966	sand to silty sand	7.0	24	863	863	863	1.523	37.0	41.3	0.983	N/A	0.319	N/A	N/A	NO	N/A	N/A	N/A	0.035	0.026	0.003
8.5	110.431	0.837	0.758	sand to silty sand	6.0	28	978	978	959	1.444	39.9	44.3	0.980	N/A	0.319	N/A	N/A	NO	N/A	N/A	N/A	0.035	0.024	0.003
9.5	123.775	0.823	0.665	sand	5.0	25	1,093	1,093	1,011	1.406	34.8	34.8	0.978	N/A	0.318	N/A	N/A	NO	N/A	N/A	N/A	0.042	0.039	0.005
10.5	102.493	0.817	0.797	sand to silty sand	4.0	26	1,208	1,176	1,064	1.371	35.1	39.3	0.976	1.000	0.325	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.006	0.001
11.5	62.191	0.565	0.908	sand to silty sand	3.0	16	1,323	1,229	1,117	1.338	20.8	24.3	0.973	1.000	0.340	0.279	0.942	YES	1.3	22.1	1,200	N/A	1.005	0.121
12.5	32.764	0.275	0.841	silty sand to sandy silt	2.0	11	1,438	1,282	1,169	1.308	14.3	22.1	0.971	1.000	0.354	0.244	0.793	YES	2.8	17.1	908	N/A	1.252	0.150
13.5	16.82	0.235	1.386	sandy silt to clayey silt	1.0	7	1,553	1,334	1,222	1.279	N/A	N/A	0.969	N/A	0.366	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
14.5	6.64	0.135	1.891	silty clay to clay	0.0	4	1,668	1,387	1,274	1.253	N/A	N/A	0.966	N/A	0.378	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
15.5	7.26	0.103	1.35	clayey silt to silty clay	-1.0	4	1,783	1,439	1,327	1.228	N/A	N/A	0.964	N/A	0.388	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
16.5	9.5	0.08	0.806	sandy silt to clayey silt	-2.0	4	1,898	1,492	1,380	1.204	N/A	N/A	0.962	N/A	0.397	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
17.5	49.582	0.136	0.274	sand to silty sand	-3.0	12	2,013	1,545	1,432	1.182	14.6	17.9	0.959	1.000	0.406	0.190	0.538	YES	1.3	16.0	798	N/A	1.680	0.202
18.5	98.944	0.337	0.34	sand	-4.0	20	2,128	1,597	1,485	1.161	23.0	23.0	0.957	1.000	0.414	0.256	0.712	YES	0.0	23.0	1,200	N/A	1.280	0.154
19.5	76.8	0.302	0.393	sand to silty sand	-5.0	19	2,243	1,650	1,537	1.141	21.9	25.5	0.955	1.000	0.422	0.301	0.821	YES	1.3	23.2	1,200	N/A	1.094	0.131
20.5	49.57	0.233	0.469	sand to silty sand	-6.0	12	2,358	1,702	1,590	1.122	13.9	17.1	0.952	1.000	0.429	0.182	0.487	YES	1.3	15.2	723	N/A	1.751	0.210
21.5	59.167	0.422	0.714	sand to silty sand	-7.0	15	2,473	1,755	1,643	1.103	16.3	19.6	0.950	1.000	0.435	0.211	0.557	YES	1.3	17.7	966	N/A	1.557	0.187
22.5	45.242	0.347	0.764	silty sand to sandy silt	-8.0	15	2,588	1,808	1,695	1.086	16.4	24.7	0.948	1.000	0.441	0.285	0.744	YES	2.8	19.2	1,118	N/A	1.172	0.141
23.5	74.325	0.313	0.421	sand to silty sand	-9.0	19	2,703	1,860	1,748	1.070	19.9	23.3	0.945	1.000	0.446	0.262	0.676	YES	1.3	21.2	1,200	N/A	1.276	0.153
24.5	121.1	0.776	0.641	sand	-10.0	24	2,818	1,913	1,800	1.054	25.5	25.5	0.943	1.000	0.451	0.303	0.771	YES	0.0	25.5	1,200	N/A	1.112	0.133
25.5	133.091	0.822	0.617	sand	-11.0	27	2,933	1,965	1,853	1.039	27.7	27.7	0.941	1.000	0.456	0.358	0.903	YES	0.0	27.7	1,200	N/A	0.898	0.108
26.5	183.136	1.199	0.655	sand	-12.0	37	3,048	2,018	1,906	1.024	37.5	37.5	0.938	0.996	0.460	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.034	0.004
27.5	158.475	1.147	0.724	sand	-13.0	32	3,163	2,071	1,958	1.011	32.0	32.0	0.936	0.986	0.465	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.173	0.021
28.5	166.108	1.062	0.639	sand	-14.0	33	3,278	2,123	2,011	0.997	33.1	33.1	0.934	0.976	0.468	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.096	0.012
29.5	183.345	1.033	0.563	sand	-15.0	37	3,393	2,176	2,063	0.985	36.1	36.1	0.931	0.967	0.472	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.055	0.007
30.5	103.738	0.844	0.813	sand to silty sand	-16.0	26	3,508	2,228	2,116	0.972	25.2	28.9	0.926	0.960	0.474	0.407	0.948	YES	1.3	26.5	1,200	N/A	0.747	0.090
31.5	10.3	0.25	2.34	clayey silt to silty clay	-17.0	5	3,623	2,281	2,169	0.960	N/A	N/A	0.918	N/A	0.474	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
32.5	7.817	0.063	0.749	clayey silt to silty clay	-18.0	4	3,738	2,334	2,221	0.949	N/A	N/A	0.909	N/A	0.473	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
33.5	11.469	0.113	0.922	sandy silt to clayey silt	-19.0	5	3,853	2,386	2,274	0.938	N/A	N/A	0.901	N/A	0.473	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
34.5	27.018	0.362	1.327	sandy silt to clayey silt	-20.0	11	3,968	2,439	2,326	0.927	N/A	N/A	0.893	N/A	0.472	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
35.5	24.718	0.314	1.27	sandy silt to clayey silt	-21.0	10	4,083	2,491	2,379	0.917	N/A	N/A	0.885	N/A	0.471	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
36.5	74.969	0.835	1.113	sand to silty sand	-22.0	19	4,198	2,544	2,432	0.907	17.0	20.3	0.877	0.928	0.470	0.219	0.498	YES	1.3	18.3	1,033	N/A	1.517	0.182
37.5	91.8	0.866	0.945	sand to silty sand	-23.0	23	4,313	2,597	2,484	0.897	20.6	24.1	0.869	0.915	0.469	0.275	0.617	YES	1.3	21.9	1,200	N/A	1.234	0.148
38.5	60.1	1.111	1.848	silty sand to sandy silt	-24.0	20	4,428	2,649	2,537	0.888	17.8	26.3	0.861	0.915	0.467	0.321	0.723	YES	2.8	20.6	1,200	N/A	1.063	0.128
39.5	71.592	1.325	1.852	silty sand to sandy silt	-25.0	24	4,543	2,702	2,589	0.879	21.0	30.2	0.852	0.902	0.466	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.523	0.063
40.5	185.192	0.814	0.44	sand	-26.0	37	4,658	2,754	2,642	0.870	32.2	32.2	0.844	0.880	0.464	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.152	0.018
41.499	52.321	0.674	1.29	silty sand to sandy silt	-27.0	17	4,772	2,807	2,695	0.862	15.0	23.0	0.836	0.906	0.462	0.257	0.581	YES	2.8	17.8	983	N/A	1.308	0.157
42.499	29.854	0.525	1.755	sandy silt to clayey silt	-28.0	12	4,887	2,859	2,747	0.853	N/A	N/A	0.828	N/A	0.460	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
43.499	34	0.852	2.501	sandy silt to clayey silt	-29.0	14	5,002	2,912	2,800	0.845	N/A	N/A	0.820	N/A	0.458	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
44.499	43.083	1.263	2.928	sandy silt to clayey silt	-30.0	17	5,117	2,965	2,852	0.837	N/A	N/A	0.812	N/A	0.455	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
45.499	41.092	1.484	3.606	clayey silt to silty clay	-31.0	21	5,232	3,017	2,905	0.830	N/A	N/A	0.804	N/A	0.453	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
46.499	118.642	1.471	1.239	sand to silty sand	-32.0	30	5,347	3,070	2,958	0.822	24.4	28.1	0.795	0.853	0.450	0.372	0.810	YES	1.3	25.7	1,200	N/A	0.814	0.098
47.499	81.2	0.465	0.574	sand to silty sand	-33.0	20	5,462	3,122	3,010	0.815	16.5	19.8	0.787	0.873	0.448	0.213	0.479	YES	1.3	17.9	988	N/A	1.543	0.185
48.499	82.958	0.482	0.581	sand to silty sand	-34.0	21	5,577	3,175	3,063	0.808	16.8	20.1	0.779	0.868	0.445	0.216	0.485	YES	1.3	18.1	1,009	N/A	1.525	0.183
49.499	109.023	0.507	0.465	sand	-35.0	22	5,692	3,228	3,115	0.801	17.5	17.5	0.771	0.861	0.442	0.186	0.417	YES	0.0	17.5	947	N/A	1.723	0.207
50.499	274.146	1.158	0.423	gravelly sand to sand	-36.0	46	5,807	3,280	3,168	0.795	36.3	36.3	0.763	0.820	0.439	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.047	0.006

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	G-04
Ground Surf. Elevation	10.0 ft
GWT Depth During Testing, Z_w	8.2 ft
GWT Depth For Design, Z_{wd}	5.0 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_w	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

REFERENCES

+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ $CSR = 0.65\ A_{max}\ (\sigma_v/\sigma'_v)\ r_d$

+++ $FS = (CRR_{7.5}/CSR)\ MSF\ K_\sigma\ K_\alpha$ -->> where K_α =1.0 and MSF 1.15

* S_v value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis asssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils = 8.00 feet

Earthquake-Induced Settlements:

- Liquefaction-Induced Settlement	1.43 inches	<— Saturated Sands
- Seismic Compaction Settlement =	0.00 inches	<— Dry or Unsaturated Sands
Total:	1.43 inches	

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +															RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) σ'_v (psf)	Effective Vert. Stress (Testing) σ'_v (psf)	SPT Stress Correction Factor C_R	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy ?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.5	92.785	0.216	0.233	sand	9.0	19	58	58	58	1.700	31.5	31.5	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	0.008	0.008	0.001
1.5	119.275	0.675	0.566	sand	8.0	24	173	173	173	1.700	40.6	40.6	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.014	0.011	0.001
2.5	213.5	1.097	0.514	sand	7.0	43	288	288	288	1.700	72.6	72.6	0.994	N/A	0.323	N/A	N/A	NO	N/A	N/A	N/A	0.014	0.005	0.000
3.5	246.092	1.598	0.649	sand	6.0	49	403	403	403	1.700	83.7	83.7	0.992	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.016	0.005	0.000
4.5	223.969	1.812	0.809	sand	5.0	45	518	518	518	1.700	76.1	76.1	0.990	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.019	0.007	0.000
5.5	209.15	1.613	0.771	sand	4.0	42	633	601	633	1.700	71.1	71.1	0.987	1.000	0.337	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
6.5	147.367	1.215	0.824	sand	3.0	29	748	654	748	1.636	48.2	48.2	0.985	1.000	0.366	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
7.5	107.771	0.989	0.917	sand to silty sand	2.0	27	863	707	863	1.523	41.0	45.5	0.983	1.000	0.390	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
8.5	115.967	1.017	0.878	sand to silty sand	1.0	29	978	759	959	1.444	41.9	46.4	0.980	1.000	0.410	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.004	0.001
9.5	100.808	0.863	0.856	sand to silty sand	0.0	25	1,093	812	1,011	1.406	35.4	39.6	0.978	1.000	0.428	N/A	N/A	YES	2.8	19.5	1,147	N/A	1.146	0.138
10.5	36.483	0.617	1.694	silty sand to sandy silt	-1.0	12	1,208	864	1,064	1.371	16.7	25.0	0.976	1.000	0.443	0.292	0.758	NO	N/A	N/A	N/A	N/A	N/A	N/A
11.5	7.785	0.083	1.066	clayey silt to silty clay	-2.0	4	1,323	917	1,117	1.338	N/A	N/A	0.973	N/A	0.456	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
12.5	6.723	0.082	1.211	sensitive fine grained	-3.0	3	1,438	970	1,169	1.308	N/A	N/A	0.971	N/A	0.468	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
13.5	8.058	0.112	1.392	clayey silt to silty clay	-4.0	4	1,553	1,022	1,222	1.279	N/A	N/A	0.969	N/A	0.478	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
14.5	14.143	0.069	0.488	sandy silt to clayey silt	-5.0	6	1,668	1,075	1,274	1.253	N/A	N/A	0.966	N/A	0.487	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
15.5	16.492	0.115	0.698	sandy silt to clayey silt	-6.0	7	1,783	1,127	1,327	1.228	N/A	N/A	0.964	N/A	0.495	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.573	0.069
16.5	89.362	0.475	0.532	sand to silty sand	-7.0	22	1,898	1,180	1,380	1.204	26.9	30.7	0.962	1.000	0.503	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.027	0.003
17.5	115.692	0.882	0.763	sand to silty sand	-8.0	29	2,013	1,233	1,432	1.182	34.2	38.3	0.959	1.000	0.509	N/A	N/A	YES	1.3	22.7	1,200	N/A	1.202	0.144
18.5	73.477	0.447	0.608	sand to silty sand	-9.0	18	2,128	1,285	1,485	1.161	21.3	24.8	0.957	1.000	0.515	0.289	0.645	YES	2.8	13.1	523	N/A	1.749	0.210
19.5	26.975	0.124	0.46	silty sand to sandy silt	-10.0	9	2,243	1,338	1,537	1.141	10.3	17.3	0.955	1.000	0.520	0.184	0.407	YES	0.0	29.3	1,200	N/A	0.785	0.094
20.5	130.708	0.682	0.521	sand	-11.0	26	2,358	1,390	1,590	1.122	29.3	29.3	0.952	1.000	0.525	0.426	0.934	YES	N/A	N/A	N/A	N/A	0.000	0.000
21.5	225.008	2.022	0.898	sand	-12.0	45	2,473	1,443	1,643	1.103	49.7	49.7	0.950	1.000	0.529	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
22.5	208.862	2.259	1.081	sand	-13.0	42	2,588	1,496	1,695	1.086	45.4	45.4	0.948	1.000	0.533	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
23.5	191.883	1.842	0.96	sand	-14.0	38	2,703	1,548	1,748	1.070	41.1	41.1	0.945	1.000	0.536	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.106	0.013
24.5	114.521	0.958	0.836	sand to silty sand	-15.0	29	2,818	1,601	1,800	1.054	30.2	34.1	0.943	1.000	0.539	N/A	N/A	YES	2.8	16.9	891	N/A	1.416	0.170
25.5	40.731	0.252	0.617	silty sand to sandy silt	-16.0	14	2,933	1,653	1,853	1.039	14.1	21.9	0.941	1.000	0.542	0.241	0.511	NO	N/A	N/A	N/A	N/A	N/A	N/A
26.5	16.115	0.131	0.809	sandy silt to clayey silt	-17.0	6	3,048	1,706	1,906	1.024	N/A	N/A	0.938	N/A	0.545	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
27.5	13.95	0.136	0.962	sandy silt to clayey silt	-18.0	6	3,163	1,759	1,958	1.011	N/A	N/A	0.936	N/A	0.547	N/A	N/A	YES	2.8	9.8	298	N/A	2.075	0.249
28.5	20.964	0.072	0.34	silty sand to sandy silt	-19.0	7	3,278	1,811	2,011	0.997	7.0	13.4	0.934	1.000	0.549	0.144	0.302	NO	N/A	N/A	N/A	N/A	N/A	N/A
29.5	9.125	0.084	0.903	clayey silt to silty clay	-20.0	5	3,393	1,864	2,063	0.985	N/A	N/A	0.931	N/A	0.551	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
30.5	10.421	0.144	1.345	clayey silt to silty clay	-21.0	5	3,508	1,916	2,116	0.972	N/A	N/A	0.926	N/A	0.551	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31.5	11.417	0.148	1.272	clayey silt to silty clay	-22.0	6	3,623	1,969	2,169	0.960	N/A	N/A	0.918	N/A	0.549	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
32.5	12.4	0.2	1.577	clayey silt to silty clay	-23.0	6	3,738	2,022	2,221	0.949	N/A	N/A	0.909	N/A	0.546	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
33.5	12.162	0.272	2.176	clayey silt to silty clay	-24.0	6	3,853	2,074	2,274	0.938	N/A	N/A	0.901	N/A	0.544	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
34.5	21.075	0.344	1.625	sandy silt to clayey silt	-25.0	8	3,968	2,127	2,326	0.927	N/A	N/A	0.893	N/A	0.542	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
35.5	12.177	0.212	1.727	clayey silt to silty clay	-26.0	6	4,083	2,179	2,379	0.917	N/A	N/A	0.885	N/A	0.539	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
36.5	25.642	0.579	2.246	sandy silt to clayey silt	-27.0	10	4,198	2,232	2,432	0.907	N/A	N/A	0.877	N/A	0.536	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
37.5	17.315	0.301	1.726	sandy silt to clayey silt	-28.0	7	4,313	2,285	2,484	0.897	N/A	N/A	0.869	N/A	0.533	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
38.5	22.754	0.423	1.844	sandy silt to clayey silt	-29.0	9	4,428	2,337	2,537	0.888	N/A	N/A	0.861	N/A	0.530	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
39.5	34.142	0.936	2.736	sandy silt to clayey silt	-30.0	14	4,543	2,390	2,589	0.879	N/A	N/A	0.852	N/A	0.527	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
40.5	197.354	2.674	1.355	sand to silty sand	-31.0	49	4,658	2,442	2,642	0.870	42.9	47.5	0.844	0.923	0.523	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
41.499	421.885	5.822	1.38	sand	-32.0	84	4,772	2,495	2,695	0.862	72.7	72.7	0.836	0.915	0.520	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
42.499	326.031	1.735	0.532	gravelly sand to sand	-33.0	54	4,887	2,547	2,747	0.853	46.4	46.4	0.828	0.908	0.516	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
43.499	317.907	2.083	0.655	gravelly sand to sand	-34.0	53	5,002	2,600	2,800	0.845	44.8	44.8	0.820	0.900	0.513	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
44.499	271.315	2.04	0.752	sand	-35.0	54	5,117	2,653	2,852	0.837	45.4	45.4	0.812	0.893	0.509	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.084	0.010
45.499	209.315	2.253	1.077	sand	-36.0	42	5,232	2,705	2,905	0.830	34.7	34.7	0.804	0.886	0.505	N/A	N/A	YES	0.0	25.2	1,200	N/A	1.174	0.141
46.499	153.133	1.23	0.804	sand	-37.0	31	5,347	2,758	2,958	0.822	25.2	25.2	0.795	0.886	0.501	0.296	0.601	YES	1.3	24.8	1,200	N/A	1.034	0.124
47.499	115.175	0.977	0.849	sand to silty sand	-38.0	29	5,462	2,810	3,010	0.815	23.5	27.1	0.787	0.884	0.497	0.341	0.697	NO	N/A	N/A	N/A	N/A	0.522	0.063
48.499	80.254	1.174	1.464	silty sand to sandy silt	-39.0	27	5,577	2,863	3,063	0.808	21.6	30.9	0.779	0.882	0.493	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
49.499	56.308	1.474	2.622	sandy silt to clayey silt	-40.0	23	5,692	2,916	3,115	0.801	N/A	N/A	0.771	N/A	0.489	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
50.499	41.054	0.956	2.333	sandy silt to clayey silt	-41.0	16	5,807	2,968	3,168	0.795	N/A	N/A	0.763	N/A	0.485	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	G-05
Ground Surf. Elevation	7.5 ft
GWT Depth During Testing, Z_w	8.2 ft
GWT Depth For Design, Z_{wd}	2.5 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_{ss}	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

REFERENCES

+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ $CSR = 0.65\ A_{max}\ (\sigma_v/\sigma_v')\ r_d$

+++ $FS = (CRR_{7.5}/CSR)\ MSF\ K_\sigma\ K_\alpha$ -->>, where K_α =1.0 and MSF 1.15

* S_v value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis assssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils = 13.00 feet

Earthquake-Induced Settlements:

- Liquefaction-Induced Settlement: 2.45 inches <-- Saturated Sands
- Seismic Compaction Settlement = 0.00 inches <-- Dry or Unsaturated Sands

Total: 2.45 inches

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +														RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) σ_v' (psf)	Effective Vert. Stress (Testing) σ_v' (psf)	SPT Stress Correction Factor C_N	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy ?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.5	97.558	0.451	0.462	sand	6.5	20	58	58	58	1.700	33.2	33.2	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	0.008	0.008	0.001
1.5	213.392	1.362	0.638	sand	5.5	43	173	173	173	1.700	72.6	72.6	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.010	0.004	0.000
2.5	192.764	1.842	0.955	sand	4.5	39	288	288	288	1.700	65.5	65.5	0.994	1.000	0.323	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
3.5	171.05	1.618	0.946	sand	3.5	34	403	340	403	1.700	58.2	58.2	0.992	1.000	0.381	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
4.5	173.177	1.268	0.732	sand	2.5	35	518	393	518	1.700	58.9	58.9	0.990	1.000	0.424	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
5.5	163.129	1.439	0.882	sand	1.5	33	633	445	633	1.700	55.5	55.5	0.987	1.000	0.456	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
6.5	146.471	0.885	0.604	sand	0.5	29	748	498	748	1.636	47.9	47.9	0.985	1.000	0.481	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
7.5	134.775	0.973	0.722	sand	-0.5	27	863	551	863	1.523	41.0	41.0	0.983	1.000	0.500	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.002	0.000
8.5	98.777	0.945	0.957	sand to silty sand	-1.5	25	978	603	959	1.444	35.7	39.9	0.980	1.000	0.516	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
9.5	22.569	0.313	1.388	sandy silt to clayey silt	-2.5	9	1,093	656	1,011	1.406	N/A	N/A	0.978	N/A	0.530	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
10.5	10.862	0.097	0.891	sandy silt to clayey silt	-3.5	4	1,208	708	1,064	1.371	N/A	N/A	0.976	N/A	0.540	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
11.5	6.3	0.1	1.577	sensitive fine grained	-4.5	3	1,323	761	1,117	1.338	N/A	N/A	0.973	N/A	0.550	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
12.5	6.462	0.088	1.351	sensitive fine grained	-5.5	3	1,438	814	1,169	1.308	N/A	N/A	0.971	N/A	0.558	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
13.5	5.892	0.065	1.082	sensitive fine grained	-6.5	3	1,553	866	1,222	1.279	N/A	N/A	0.969	N/A	0.564	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
14.5	38.554	0.161	0.417	silty sand to sandy silt	-7.5	13	1,668	919	1,274	1.253	16.1	24.3	0.966	1.000	0.570	0.279	0.563	YES	2.8	18.9	1,090	N/A	1.244	0.149
15.5	32.869	0.128	0.388	silty sand to sandy silt	-8.5	11	1,783	971	1,327	1.228	13.5	21.1	0.964	1.000	0.575	0.230	0.460	YES	2.8	16.3	825	N/A	1.473	0.177
16.5	34.85	0.214	0.614	silty sand to sandy silt	-9.5	12	1,898	1,024	1,380	1.204	14.0	21.8	0.962	1.000	0.579	0.239	0.475	YES	2.8	16.8	879	N/A	1.427	0.171
17.5	71.243	0.389	0.545	sand to silty sand	-10.5	18	2,013	1,077	1,432	1.182	21.0	24.6	0.959	1.000	0.583	0.283	0.559	YES	1.3	22.4	1,200	N/A	1.226	0.147
18.5	97.25	0.71	0.73	sand to silty sand	-11.5	24	2,128	1,129	1,485	1.161	28.2	32.1	0.957	1.000	0.586	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.482	0.058
19.5	80.857	0.699	0.864	sand to silty sand	-12.5	20	2,243	1,182	1,537	1.141	23.1	26.7	0.955	1.000	0.589	0.329	0.643	YES	1.3	24.4	1,200	N/A	1.074	0.129
20.5	18.971	0.165	0.867	sandy silt to clayey silt	-13.5	8	2,358	1,234	1,590	1.122	N/A	N/A	0.952	N/A	0.591	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
21.5	20.242	0.072	0.352	silty sand to sandy silt	-14.5	7	2,473	1,287	1,643	1.103	7.4	13.9	0.950	1.000	0.593	0.150	0.290	YES	2.8	10.2	324	N/A	1.994	0.239
22.5	63.67	0.278	0.436	sand to silty sand	-15.5	16	2,588	1,340	1,695	1.086	17.3	20.6	0.948	1.000	0.595	0.223	0.432	YES	1.3	18.6	1,062	N/A	1.511	0.181
23.5	88.625	0.722	0.815	sand to silty sand	-16.5	22	2,703	1,392	1,748	1.070	23.7	27.3	0.945	1.000	0.596	0.348	0.671	YES	1.3	25.0	1,200	N/A	1.025	0.123
24.5	64.317	0.475	0.738	sand to silty sand	-17.5	16	2,818	1,445	1,800	1.054	16.9	20.3	0.943	1.000	0.598	0.219	0.421	YES	1.3	18.3	1,028	N/A	1.537	0.184
25.5	12.9	0.123	0.947	sandy silt to clayey silt	-18.5	5	2,933	1,497	1,853	1.039	N/A	N/A	0.941	N/A	0.599	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
26.5	7.311	0.11	1.484	clayey silt to silty clay	-19.5	4	3,048	1,550	1,906	1.024	N/A	N/A	0.938	N/A	0.600	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
27.5	7.678	0.128	1.608	clayey silt to silty clay	-20.5	4	3,163	1,603	1,958	1.011	N/A	N/A	0.936	N/A	0.600	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
28.5	49.627	0.096	0.194	sand to silty sand	-21.5	12	3,278	1,655	2,011	0.997	12.4	15.5	0.934	1.000	0.601	0.165	0.315	YES	1.3	13.7	576	N/A	1.883	0.226
29.5	18.336	0.164	0.892	sandy silt to clayey silt	-22.5	7	3,393	1,708	2,063	0.985	N/A	N/A	0.931	N/A	0.601	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
30.5	9.355	0.094	0.992	clayey silt to silty clay	-23.5	5	3,508	1,760	2,116	0.972	N/A	N/A	0.926	N/A	0.599	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31.5	20.155	0.325	1.602	sandy silt to clayey silt	-24.5	8	3,623	1,813	2,169	0.960	N/A	N/A	0.918	N/A	0.596	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
32.5	107.664	0.725	0.674	sand to silty sand	-25.5	27	3,738	1,866	2,221	0.949	25.5	29.3	0.909	1.000	0.592	0.424	0.823	YES	1.3	26.9	1,200	N/A	0.817	0.098
33.5	160.745	0.728	0.453	sand	-26.5	32	3,853	1,918	2,274	0.938	30.2	30.2	0.901	1.000	0.588	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.714	0.086
34.5	185.442	0.743	0.401	sand	-27.5	37	3,968	1,971	2,326	0.927	34.4	34.4	0.893	1.000	0.584	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.125	0.015
35.5	165.5	0.665	0.402	sand	-28.5	33	4,083	2,023	2,379	0.917	30.3	30.3	0.885	0.995	0.580	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.692	0.083
36.5	134.745	0.449	0.334	sand	-29.5	27	4,198	2,076	2,432	0.907	24.4	24.4	0.877	0.986	0.576	0.281	0.554	YES	0.0	24.4	1,200	N/A	1.235	0.148
37.5	146.892	0.428	0.292	sand	-30.5	29	4,313	2,129	2,484	0.897	26.4	26.4	0.869	0.976	0.572	0.322	0.631	YES	0.0	26.4	1,200	N/A	1.096	0.132
38.5	199.942	1.313	0.657	sand	-31.5	40	4,428	2,181	2,537	0.888	35.5	35.5	0.861	0.966	0.568	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.084	0.010
39.5	198.662	1.841	0.927	sand	-32.5	40	4,543	2,234	2,589	0.879	34.9	34.9	0.852	0.957	0.563	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.094	0.011
40.5	180.62	1.446	0.801	sand	-33.5	36	4,658	2,286	2,642	0.870	31.4	31.4	0.844	0.948	0.559	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.553	0.066
41.499	207.62	1.393	0.671	sand	-34.5	42	4,772	2,339	2,695	0.862	35.8	35.8	0.836	0.939	0.555	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.076	0.009
42.499	290.95	2.864	0.985	sand	-35.5	58	4,887	2,391	2,747	0.853	49.7	49.7	0.828	0.931	0.550	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
43.499	285.667	1.5	0.525	gravelly sand to sand	-36.5	48	5,002	2,444	2,800	0.845	40.2	40.2	0.820	0.923	0.545	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
44.499	234.482	1.18	0.503	sand	-37.5	47	5,117	2,497	2,852	0.837	39.3	39.3	0.812	0.915	0.541	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.013	0.002
45.499	82.225	2.433	2.961	sandy silt to clayey silt	-38.5	33	5,232	2,549	2,905	0.830	N/A	N/A	0.804	N/A	0.536	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
46.499	53.569	2.075	3.875	clayey silt to silty clay	-39.5	27	5,347	2,602	2,958	0.822	N/A	N/A	0.795	N/A	0.531	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
47.499	94.25	2.322	2.465	silty sand to sandy silt	-40.5	31	5,462	2,654	3,010	0.815	25.6	35.7	0.787	0.898	0.527	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.071	0.009
48.499	60.933	1.951	3.202	sandy silt to clayey silt	-41.5	24	5,577	2,707	3,063	0.808	N/A	N/A	0.779	N/A	0.522	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
49.499	66.308	1.743	2.628	sandy silt to clayey silt	-42.5	27	5,692	2,760	3,115	0.801	N/A	N/A	0.771	N/A	0.517	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
50.499	69.709	1.721	2.469	sandy silt to clayey silt	-43.5	28	5,807	2,812	3,168	0.795	N/A	N/A	0.763	N/A	0.512	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	G-06
Ground Surf. Elevation	10.0 ft
GWT Depth During Testing, Z_w	8.2 ft
GWT Depth For Design, Z_{wd}	5.0 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_w	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

REFERENCES

+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ $CSR = 0.65\ A_{max}\ (\sigma_v/\sigma_v')\ r_d$

+++ $FS = (CRR_{7.5}/CSR)\ MSF\ K_\sigma\ K_\alpha$ -->>, where K_α =1.0 and MSF 1.15

* S_v value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis asssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils = 10.00 feet

Earthquake-Induced Settlements:

- Liquefaction-Induced Settlement	1.50 inches	<— Saturated Sands
- Seismic Compaction Settlement =	0.01 inches	<— Dry or Unsaturated Sands
Total:	1.51 inches	

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +															RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) $\sigma_{v'}$ (psf)	Effective Vert. Stress (Testing) $\sigma_{v'}$ (psf)	SPT Stress Correction Factor C_R	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy ?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.5	90.717	0.493	0.544	sand to silty sand	9.0	23	58	58	58	1.700	38.6	42.9	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	0.007	0.005	0.001
1.5	83.669	1.363	1.629	silty sand to sandy silt	8.0	28	173	173	173	1.700	47.4	61.9	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.011	0.005	0.000
2.5	49.407	1.053	2.13	sandy silt to clayey silt	7.0	20	288	288	288	1.700	N/A	N/A	0.994	N/A	0.323	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
3.5	69.492	0.806	1.16	sand to silty sand	6.0	17	403	403	403	1.700	29.5	33.5	0.992	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.027	0.026	0.003
4.5	40.792	0.452	1.108	silty sand to sandy silt	5.0	14	518	518	518	1.700	23.1	32.7	0.990	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.031	0.031	0.004
5.5	31.958	0.278	0.871	silty sand to sandy silt	4.0	11	633	601	633	1.700	18.1	26.7	0.987	1.000	0.337	0.331	1.128	YES	2.8	20.9	1,200	N/A	0.165	0.020
6.5	25.293	0.536	2.117	sandy silt to clayey silt	3.0	10	748	654	748	1.636	N/A	N/A	0.985	N/A	0.366	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
7.5	37.1	0.284	0.766	silty sand to sandy silt	2.0	12	863	707	863	1.523	18.8	27.6	0.983	1.000	0.390	0.356	1.051	YES	2.8	21.6	1,200	N/A	0.553	0.066
8.5	29.638	0.444	1.496	sandy silt to clayey silt	1.0	12	978	759	959	1.444	N/A	N/A	0.980	N/A	0.410	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
9.5	20.231	0.173	0.853	sandy silt to clayey silt	0.0	8	1,093	812	1,011	1.406	N/A	N/A	0.978	N/A	0.428	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
10.5	21.738	0.221	1.012	sandy silt to clayey silt	-1.0	9	1,208	864	1,064	1.371	N/A	N/A	0.976	N/A	0.443	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
11.5	6.2	0.124	1.917	silty clay to clay	-2.0	4	1,323	917	1,117	1.338	N/A	N/A	0.973	N/A	0.456	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
12.5	29.433	0.141	0.476	silty sand to sandy silt	-3.0	10	1,438	970	1,169	1.308	12.8	20.4	0.971	1.000	0.468	0.220	0.342	YES	2.8	15.6	763	N/A	1.509	0.181
13.5	42.792	0.193	0.45	sand to silty sand	-4.0	11	1,553	1,022	1,222	1.279	13.7	16.8	0.969	1.000	0.478	0.179	0.431	YES	1.3	15.0	702	N/A	1.778	0.213
14.5	19.292	0.152	0.781	sandy silt to clayey silt	-5.0	8	1,668	1,075	1,274	1.253	N/A	N/A	0.966	N/A	0.487	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
15.5	38.062	0.215	0.562	silty sand to sandy silt	-6.0	13	1,783	1,127	1,327	1.228	15.6	23.7	0.964	1.000	0.495	0.268	0.623	YES	2.8	18.4	1,038	N/A	1.282	0.154
16.5	105.183	0.563	0.534	sand	-7.0	21	1,898	1,180	1,380	1.204	25.3	25.3	0.962	1.000	0.503	0.299	0.683	YES	0.0	25.3	1,200	N/A	1.164	0.140
17.5	90.45	0.496	0.548	sand to silty sand	-8.0	23	2,013	1,233	1,432	1.182	26.7	30.5	0.959	1.000	0.509	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.609	0.073
18.5	123.867	0.632	0.51	sand	-9.0	25	2,128	1,285	1,485	1.161	28.8	28.8	0.957	1.000	0.515	0.399	0.891	YES	0.0	28.8	1,200	N/A	0.850	0.102
19.5	167.385	1.203	0.719	sand	-10.0	33	2,243	1,338	1,537	1.141	38.2	38.2	0.955	1.000	0.520	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.030	0.004
20.5	201.121	1.593	0.792	sand	-11.0	40	2,358	1,390	1,590	1.122	45.1	45.1	0.952	1.000	0.525	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
21.5	134.454	1.428	1.061	sand to silty sand	-12.0	34	2,473	1,443	1,643	1.103	37.1	41.4	0.950	1.000	0.529	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
22.5	168.369	1.112	0.66	sand	-13.0	34	2,588	1,496	1,695	1.086	36.6	36.6	0.948	1.000	0.533	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.058	0.007
23.5	129.715	1.298	1	sand to silty sand	-14.0	32	2,703	1,548	1,748	1.070	34.7	38.9	0.945	1.000	0.536	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.020	0.002
24.5	13.477	0.507	3.68	silty clay to clay	-15.0	9	2,818	1,601	1,800	1.054	N/A	N/A	0.943	N/A	0.539	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
25.5	6.286	0.176	2.547	silty clay to clay	-16.0	4	2,933	1,653	1,853	1.039	N/A	N/A	0.941	N/A	0.542	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
26.5	5.962	0.132	1.998	silty clay to clay	-17.0	4	3,048	1,706	1,906	1.024	N/A	N/A	0.938	N/A	0.545	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
27.5	6.9	0.132	1.737	clayey silt to silty clay	-18.0	3	3,163	1,759	1,958	1.011	N/A	N/A	0.936	N/A	0.547	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
28.5	8.415	0.125	1.374	clayey silt to silty clay	-19.0	4	3,278	1,811	2,011	0.997	N/A	N/A	0.934	N/A	0.549	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
29.5	9.092	0.164	1.689	clayey silt to silty clay	-20.0	5	3,393	1,864	2,063	0.985	N/A	N/A	0.931	N/A	0.551	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
30.5	10.425	0.188	1.719	clayey silt to silty clay	-21.0	5	3,508	1,916	2,116	0.972	N/A	N/A	0.926	N/A	0.551	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31.5	16.358	0.419	2.537	clayey silt to silty clay	-22.0	8	3,623	1,969	2,169	0.960	N/A	N/A	0.918	N/A	0.549	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
32.5	17.908	0.435	2.41	clayey silt to silty clay	-23.0	9	3,738	2,022	2,221	0.949	N/A	N/A	0.909	N/A	0.546	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
33.5	14.558	0.322	2.158	clayey silt to silty clay	-24.0	7	3,853	2,074	2,274	0.938	N/A	N/A	0.901	N/A	0.544	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
34.5	12.331	0.275	2.188	clayey silt to silty clay	-25.0	6	3,968	2,127	2,326	0.927	N/A	N/A	0.893	N/A	0.542	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
35.5	21.225	0.477	2.224	sandy silt to clayey silt	-26.0	8	4,083	2,179	2,379	0.917	N/A	N/A	0.885	N/A	0.539	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
36.5	43.685	1.045	2.394	sandy silt to clayey silt	-27.0	17	4,198	2,232	2,432	0.907	N/A	N/A	0.877	N/A	0.536	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.347	0.042
37.5	126.65	1.314	1.038	sand to silty sand	-28.0	32	4,313	2,285	2,484	0.897	28.4	32.3	0.869	0.948	0.533	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
38.5	337.315	1.06	0.314	gravelly sand to sand	-29.0	56	4,428	2,337	2,537	0.888	49.9	49.9	0.861	0.940	0.530	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
39.5	313.833	0.873	0.278	gravelly sand to sand	-30.0	52	4,543	2,390	2,589	0.879	46.0	46.0	0.852	0.931	0.527	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.001	0.000
40.5	229.6	0.93	0.405	sand	-31.0	46	4,658	2,442	2,642	0.870	40.0	40.0	0.844	0.923	0.523	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
41.499	42.931	0.898	2.093	sandy silt to clayey silt	-32.0	17	4,772	2,495	2,695	0.862	N/A	N/A	0.836	N/A	0.520	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
42.499	59.392	0.673	1.134	silty sand to sandy silt	-33.0	20	4,887	2,547	2,747	0.853	16.9	25.3	0.828	0.928	0.516	0.297	0.615	YES	2.8	19.7	1,169	N/A	1.171	0.140
43.499	130.1	0.652	0.501	sand	-34.0	26	5,002	2,600	2,800	0.845	22.0	22.0	0.820	0.912	0.513	0.242	0.495	YES	0.0	22.0	1,200	N/A	1.408	0.169
44.499	277.271	2.454	0.885	sand	-35.0	55	5,117	2,653	2,852	0.837	46.4	46.4	0.812	0.893	0.509	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
45.499	409.939	1.378	0.336	gravelly sand to sand	-36.0	68	5,232	2,705	2,905	0.830	56.7	56.7	0.804	0.886	0.505	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
46.499	460.893	2.591	0.562	gravelly sand to sand	-37.0	77	5,347	2,758	2,958	0.822	63.2	63.2	0.795	0.879	0.501	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
47.499	391.808	2.126	0.543	gravelly sand to sand	-38.0	65	5,462	2,810	3,010	0.815	53.2	53.2	0.787	0.873	0.497	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
48.499	119.008	2.005	1.687	silty sand to sandy silt	-39.0	40	5,577	2,863	3,063	0.808	32.1	43.5	0.779	0.866	0.493	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
49.499	137	1.249	0.913	sand	-40.0	27	5,692	2,916	3,115	0.801	22.0	22.0	0.771	0.876	0.489	0.241	0.497	YES	0.0	22.0	1,200	N/A	1.406	0.169
50.499	145.108	1.63	1.124	sand to silty sand	-41.0	36	5,807	2,968	3,168	0.795	28.8	32.7	0.763	0.854	0.485	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.154	0.018

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	C-01
Ground Surf. Elevation	10.0 ft
GWT Depth During Testing, Z_w	12.0 ft
GWT Depth For Design, Z_{wd}	5.0 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_{w}	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

REFERENCES

+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ $CSR = 0.65\ A_{max}\ (\sigma_v/\sigma_v')\ r_d$

+++ $FS = (CRR_{7.5}/CSR)\ MSF\ K_\sigma\ K_\alpha$ -->,where K_α =1.0 and MSF 1.15

* S_r value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis asssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils = 13.79 feet

Earthquake-Induced Settlements:

- Liquefaction-Induced Settlement	2.35 inches	<— Saturated Sands
- Seismic Compaction Settlement =	0.00 inches	<— Dry or Unsaturated Sands
Total:	2.35 inches	

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +														RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) $\sigma_{v'}$ (psf)	Effective Vert. Stress (Testing) $\sigma_{v'}$ (psf)	SPT Stress Correction Factor C_N	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy ?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.49	15.5	0.24	1.54	sandy silt to clayey silt	9.0	6	56	56	56	1.700	N/A	N/A	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
1.48	70.3	0.33	0.46	sand to silty sand	8.0	18	170	170	170	1.700	29.9	33.8	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.016	0.015	0.002
2.46	130.4	0.57	0.44	sand	7.1	26	283	283	283	1.700	44.3	44.3	0.994	N/A	0.323	N/A	N/A	NO	N/A	N/A	N/A	0.019	0.013	0.001
3.44	184.5	0.75	0.41	sand	6.1	37	396	396	396	1.700	62.7	62.7	0.992	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.018	0.008	0.000
4.43	163.2	0.81	0.5	sand	5.1	33	509	509	509	1.700	55.5	55.5	0.990	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.023	0.012	0.000
5.41	168.6	1.04	0.62	sand	4.1	34	622	597	622	1.700	57.3	57.3	0.987	1.000	0.335	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
6.4	161.3	1.07	0.67	sand	3.2	32	736	649	736	1.648	53.2	53.2	0.985	1.000	0.363	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
7.3	172	1.24	0.72	sand	2.3	34	840	696	840	1.543	53.1	53.1	0.983	1.000	0.385	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
8.2	153.3	1.43	0.93	sand	1.3	31	943	743	943	1.456	44.7	44.7	0.981	1.000	0.404	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
9.19	159.4	1.24	0.78	sand	0.3	32	1,057	795	1,057	1.376	43.9	43.9	0.979	1.000	0.423	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
10.17	112.7	0.93	0.83	sand to silty sand	-0.7	28	1,170	847	1,170	1.308	36.8	41.1	0.976	1.000	0.438	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
11.15	29.2	0.45	1.54	sandy silt to clayey silt	-1.6	12	1,282	898	1,282	1.249	N/A	N/A	0.974	N/A	0.452	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
12.14	12.5	0.14	1.09	sandy silt to clayey silt	-2.7	5	1,396	951	1,387	1.201	N/A	N/A	0.972	N/A	0.464	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
13.21	12.4	0.1	0.81	sandy silt to clayey silt	-3.7	5	1,519	1,007	1,444	1.177	N/A	N/A	0.969	N/A	0.475	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
14.27	12.3	0.05	0.41	sandy silt to clayey silt	-4.8	5	1,641	1,063	1,499	1.155	N/A	N/A	0.967	N/A	0.485	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
15.26	7.5	0.03	0.33	sensitive fine grained	-5.8	4	1,755	1,115	1,551	1.135	N/A	N/A	0.964	N/A	0.493	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
16.24	26.3	0.07	0.28	silty sand to sandy silt	-6.7	9	1,868	1,166	1,603	1.117	9.8	16.8	0.962	1.000	0.501	0.178	0.409	YES	2.8	12.6	485	N/A	1.789	0.210
17.22	73.6	0.29	0.4	sand to silty sand	-7.7	18	1,980	1,218	1,655	1.099	20.2	23.7	0.960	1.000	0.507	0.268	0.608	YES	1.3	21.6	1,200	N/A	1.283	0.152
18.21	90.1	0.37	0.41	sand to silty sand	-8.7	23	2,094	1,270	1,707	1.083	24.4	28.1	0.958	1.000	0.513	0.371	0.833	YES	1.3	25.7	1,200	N/A	0.941	0.111
19.19	30.6	0.12	0.4	silty sand to sandy silt	-9.7	10	2,207	1,321	1,758	1.067	10.9	18.1	0.955	1.000	0.518	0.192	0.427	YES	2.8	13.7	574	N/A	1.695	0.201
20.18	100.2	0.52	0.52	sand to silty sand	-10.7	25	2,321	1,373	1,810	1.051	26.3	30.1	0.953	1.000	0.523	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.683	0.080
21.16	160.1	1.28	0.8	sand	-11.7	32	2,433	1,425	1,862	1.036	33.2	33.2	0.951	1.000	0.528	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.169	0.020
22.15	151.8	0.94	0.62	sand	-12.6	30	2,547	1,477	1,914	1.022	31.0	31.0	0.948	1.000	0.532	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.575	0.068
23.13	168.4	1.47	0.87	sand	-13.6	34	2,660	1,529	1,965	1.009	34.0	34.0	0.946	1.000	0.535	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.113	0.013
24.11	167.2	1.46	0.87	sand	-14.6	33	2,773	1,580	2,017	0.996	33.3	33.3	0.944	1.000	0.538	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.171	0.020
25.1	151.1	1.6	1.06	sand to silty sand	-15.6	38	2,887	1,632	2,069	0.983	37.1	41.4	0.941	1.000	0.541	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
26.08	120.9	0.84	0.7	sand	-16.6	24	2,999	1,684	2,121	0.971	23.5	23.5	0.939	1.000	0.544	0.265	0.560	YES	0.0	23.5	1,200	N/A	1.304	0.135
27.07	133.4	1.03	0.77	sand	-17.6	27	3,113	1,736	2,173	0.959	25.6	25.6	0.937	1.000	0.546	0.304	0.641	YES	0.0	25.6	1,200	N/A	1.151	0.135
28.05	73.3	1	1.37	silty sand to sandy silt	-18.5	24	3,226	1,787	2,224	0.948	23.2	32.8	0.935	1.000	0.548	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.252	0.030
29.04	10.4	0.16	1.56	clayey silt to silty clay	-19.5	5	3,340	1,840	2,276	0.937	N/A	N/A	0.932	N/A	0.550	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
30.02	8.9	0.04	0.45	sandy silt to clayey silt	-20.5	4	3,452	1,891	2,328	0.927	N/A	N/A	0.930	N/A	0.552	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31	10.1	0.04	0.38	sandy silt to clayey silt	-21.5	4	3,565	1,943	2,379	0.917	N/A	N/A	0.922	N/A	0.550	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31.99	16.5	0.09	0.57	sandy silt to clayey silt	-22.5	7	3,679	1,995	2,431	0.907	N/A	N/A	0.914	N/A	0.548	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
32.97	38.2	0.52	1.35	silty sand to sandy silt	-23.5	13	3,792	2,046	2,483	0.897	11.4	18.7	0.906	0.994	0.545	0.200	0.419	YES	2.8	14.2	623	N/A	1.649	0.196
33.96	110.7	0.89	0.81	sand to silty sand	-24.5	28	3,905	2,098	2,535	0.888	24.6	28.3	0.898	0.982	0.543	0.379	0.789	YES	1.3	25.9	1,200	N/A	0.930	0.109
34.94	229.6	1.2	0.52	sand	-25.4	46	4,018	2,150	2,587	0.879	40.4	40.4	0.890	0.972	0.540	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
35.92	256.4	0.91	0.36	gravelly sand to sand	-26.4	43	4,131	2,201	2,638	0.871	37.2	37.2	0.882	0.962	0.538	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.048	0.006
36.91	225.6	0.93	0.41	sand	-27.4	45	4,245	2,253	2,690	0.862	38.9	38.9	0.874	0.953	0.535	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.019	0.002
37.89	234	1.03	0.44	sand	-28.4	47	4,357	2,305	2,742	0.854	40.0	40.0	0.866	0.945	0.532	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
38.88	155.1	1.05	0.68	sand	-29.4	31	4,471	2,357	2,794	0.846	26.2	26.2	0.858	0.939	0.529	0.319	0.651	YES	0.0	26.2	1,200	N/A	1.103	0.130
39.86	66	1.24	1.87	silty sand to sandy silt	-30.4	22	4,584	2,409	2,845	0.838	18.4	27.1	0.850	0.942	0.525	0.342	0.705	YES	2.8	21.2	1,200	N/A	1.038	0.123
40.85	157.7	1.49	0.94	sand	-31.3	32	4,698	2,461	2,898	0.831	26.2	26.2	0.841	0.923	0.522	0.318	0.647	YES	0.0	26.2	1,200	N/A	1.104	0.130
41.83	130.8	0.85	0.65	sand	-32.3	26	4,810	2,512	2,949	0.824	21.5	21.5	0.833	0.924	0.519	0.236	0.483	YES	0.0	21.5	1,200	N/A	1.442	0.170
42.81	16.3	0.22	1.32	sandy silt to clayey silt	-33.3	7	4,923	2,564	3,001	0.816	N/A	N/A	0.826	N/A	0.515	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
43.8	35.1	1.02	2.92	clayey silt to silty clay	-34.3	18	5,037	2,616	3,053	0.809	N/A	N/A	0.817	N/A	0.512	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
44.78	52.8	2.49	4.71	silty clay to clay	-35.3	35	5,150	2,667	3,104	0.803	N/A	N/A	0.809	N/A	0.508	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
45.77	74.8	3.02	4.03	clayey silt to silty clay	-36.3	37	5,264	2,720	3,156	0.796	N/A	N/A	0.801	N/A	0.504	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.070	0.008
46.75	159.7	2.55	1.6	sand to silty sand	-37.2	40	5,376	2,771	3,208	0.790	31.5	35.5	0.793	0.878	0.500	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.425	0.050
47.74	84.4	1.93	2.29	silty sand to sandy silt	-38.2	28	5,490	2,823	3,260	0.783	22.0	31.4	0.785	0.886	0.496	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
48.72	104	2.91	2.8	sandy silt to clayey silt	-39.2	42	5,603	2,875	3,311	0.777	N/A	N/A	0.777	N/A	0.492	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
49.7	184	0.74	0.4	sand	-40.2	37	5,716	2,926	3,363	0.771	28.4	28.4	0.769	0.859	0.488	0.384	0.776	YES	0.0	28.4	1,200	N/A	0.872	0.104
50.69	174.1	1.69	0.97	sand	-41.2	35	5,829	2,978	3,415	0.765	26.6	26.6	0.761	0.857	0.484	0.329	0.669	YES	0.0	26.6	1,200	N/A	1.057	0.126

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	C-02
Ground Surf. Elevation	7.5 ft
GWT Depth During Testing, Z_w	4.0 ft
GWT Depth For Design, Z_{wd}	2.5 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_w	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

REFERENCES

+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ $CSR = 0.65\ A_{max}\ (\sigma_v/\sigma_v')\ r_d$

+++ $FS = (CRR_{7.5}/CSR)\ MSF\ K_\sigma\ K_\alpha$ -->>, where K_α =1.0 and MSF 1.15

* S_v value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis asssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils = 6.98 feet

Earthquake-Induced Settlements:

- Liquefaction-Induced Settlement = 1.15 inches <-- Saturated Sands
- Seismic Compaction Settlement = 0.00 inches <-- Dry or Unsaturated Sands

Total: 1.15 inches

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +															RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) σ_v' (psf)	Effective Vert. Stress (Testing) σ_v' (psf)	SPT Stress Correction Factor C_N	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy ?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.49	163.6	0.78	0.48	sand	6.5	33	56	56	56	1.700	55.6	55.6	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	0.006	0.003	0.000
1.48	82.3	0.89	1.08	sand to silty sand	5.5	21	170	170	170	1.700	35.0	39.2	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.015	0.012	0.001
2.46	29	0.71	2.45	sandy silt to clayey silt	4.6	12	283	283	283	1.700	N/A	N/A	0.994	N/A	0.323	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
3.44	59.9	0.55	0.91	sand to silty sand	3.6	15	396	337	396	1.700	25.5	29.2	0.992	1.000	0.379	0.419	1.273	NO	N/A	N/A	N/A	N/A	0.180	0.021
4.43	41.2	0.39	0.94	silty sand to sandy silt	2.6	14	509	389	483	1.700	23.3	33.0	0.990	1.000	0.421	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.085	0.010
5.41	15.3	0.21	1.35	sandy silt to clayey silt	1.6	6	622	441	534	1.700	N/A	N/A	0.987	N/A	0.453	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
6.4	17	0.09	0.54	sandy silt to clayey silt	0.7	7	736	493	586	1.700	N/A	N/A	0.985	N/A	0.478	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
7.3	4.9	0.05	1.07	sensitive fine grained	-0.3	2	840	540	634	1.700	N/A	N/A	0.983	N/A	0.497	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
8.2	4.8	0.1	2.15	silty clay to clay	-1.2	3	943	587	681	1.700	N/A	N/A	0.981	N/A	0.512	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
9.19	8.2	0.08	0.92	clayey silt to silty clay	-2.2	4	1,057	639	733	1.652	N/A	N/A	0.979	N/A	0.526	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
10.17	6.9	0.06	0.9	clayey silt to silty clay	-3.2	3	1,170	691	785	1.597	N/A	N/A	0.976	N/A	0.537	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
11.15	11.2	0.06	0.52	sandy silt to clayey silt	-4.1	4	1,282	742	836	1.547	N/A	N/A	0.974	N/A	0.547	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
12.14	25.4	0.16	0.63	silty sand to sandy silt	-5.2	8	1,396	795	888	1.501	12.7	20.2	0.972	1.000	0.555	0.218	0.453	YES	2.8	15.5	751	N/A	1.538	0.197
13.21	106.2	1.08	1.01	sand to silty sand	-6.2	27	1,519	851	944	1.455	38.6	43.0	0.969	1.000	0.562	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
14.27	128.9	1.35	1.05	sand to silty sand	-7.3	32	1,641	907	1,000	1.414	45.6	50.3	0.967	1.000	0.569	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
15.26	123.6	1.49	1.2	sand to silty sand	-8.3	31	1,755	959	1,052	1.379	42.6	47.1	0.964	1.000	0.574	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
16.24	130.9	1.64	1.25	sand to silty sand	-9.2	33	1,868	1,010	1,104	1.346	44.0	48.7	0.962	1.000	0.578	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
17.22	129.9	1.55	1.2	sand to silty sand	-10.2	32	1,980	1,062	1,155	1.316	42.7	47.3	0.960	1.000	0.582	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
18.21	118.1	1.24	1.05	sand to silty sand	-11.2	30	2,094	1,114	1,207	1.287	38.0	42.3	0.958	1.000	0.585	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
19.19	144	1.49	1.03	sand to silty sand	-12.2	36	2,207	1,165	1,259	1.260	45.4	50.1	0.955	1.000	0.588	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
20.18	83.3	1.08	1.29	sand to silty sand	-13.2	21	2,321	1,217	1,311	1.235	25.7	29.5	0.953	1.000	0.590	0.434	0.845	YES	1.3	27.1	1,200	N/A	0.795	0.094
21.16	85.4	0.63	0.74	sand to silty sand	-14.2	21	2,433	1,269	1,363	1.212	25.9	29.6	0.951	1.000	0.592	0.442	0.859	YES	1.3	27.2	1,200	N/A	0.777	0.092
22.15	73.7	0.72	0.98	sand to silty sand	-15.1	18	2,547	1,321	1,415	1.189	21.9	25.5	0.948	1.000	0.594	0.301	0.583	YES	1.3	23.2	1,200	N/A	1.161	0.137
23.13	66.6	0.65	0.97	sand to silty sand	-16.1	17	2,660	1,373	1,466	1.168	19.4	22.9	0.946	1.000	0.596	0.255	0.492	YES	1.3	20.8	1,200	N/A	1.348	0.158
24.11	72.3	0.48	0.67	sand to silty sand	-17.1	18	2,773	1,424	1,518	1.148	20.7	24.2	0.944	1.000	0.597	0.278	0.535	YES	1.3	22.1	1,200	N/A	1.249	0.148
25.1	13.5	0.37	2.72	clayey silt to silty clay	-18.1	7	2,887	1,476	1,570	1.129	N/A	N/A	0.941	N/A	0.598	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
26.08	6.4	0.06	0.99	sensitive fine grained	-19.1	3	2,999	1,528	1,621	1.111	N/A	N/A	0.939	N/A	0.599	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
27.07	6.6	0.06	0.94	sensitive fine grained	-20.1	3	3,113	1,580	1,673	1.093	N/A	N/A	0.937	N/A	0.600	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
28.05	7.5	0.07	0.91	clayey silt to silty clay	-21.0	4	3,226	1,631	1,725	1.077	N/A	N/A	0.935	N/A	0.601	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
29.04	7.3	0.16	2.22	silty clay to clay	-22.0	5	3,340	1,684	1,777	1.061	N/A	N/A	0.932	N/A	0.601	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
30.02	8.5	0.18	2.07	clayey silt to silty clay	-23.0	4	3,452	1,735	1,829	1.046	N/A	N/A	0.930	N/A	0.598	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31	13.7	0.44	3.21	silty clay to clay	-24.0	9	3,565	1,787	1,880	1.031	N/A	N/A	0.922	N/A	0.594	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31.99	19	0.79	4.16	clay	-25.0	19	3,679	1,839	1,932	1.017	N/A	N/A	0.914	N/A	0.590	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
32.97	93.6	1.79	1.91	silty sand to sandy silt	-26.0	31	3,792	1,890	1,984	1.004	31.3	42.6	0.906	1.000	0.587	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
33.96	69.4	3.37	4.85	very stiff fine grained (*)	-27.0	69	3,905	1,942	2,036	0.991	N/A	N/A	0.898	N/A	0.583	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
34.94	50.9	3	5.9	clay	-27.9	51	4,018	1,994	2,087	0.979	N/A	N/A	0.890	N/A	0.579	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
35.92	23.7	1.58	6.66	clay	-28.9	24	4,131	2,045	2,139	0.967	N/A	N/A	0.882	N/A	0.575	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.194	0.023
36.91	123.1	1.79	1.45	sand to silty sand	-29.9	31	4,245	2,097	2,191	0.955	29.4	33.3	0.874	0.981	0.570	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.083	0.010
37.89	188.6	1.6	0.85	sand	-30.9	38	4,357	2,149	2,243	0.944	35.6	35.6	0.866	0.972	0.566	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
38.88	267.6	3.55	1.33	sand to silty sand	-31.9	67	4,471	2,201	2,295	0.934	62.5	68.0	0.858	0.962	0.562	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
39.86	258.2	1.7	0.66	sand	-32.9	52	4,584	2,253	2,346	0.923	47.7	47.7	0.850	0.954	0.557	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.650	0.076
40.85	167.6	0.68	0.4	sand	-33.8	34	4,698	2,305	2,398	0.913	30.6	30.6	0.841	0.945	0.553	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.647	0.076
41.83	169.4	1.32	0.78	sand	-34.8	34	4,810	2,356	2,450	0.904	30.6	30.6	0.833	0.937	0.549	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
42.81	260	1.82	0.7	sand	-35.8	52	4,923	2,408	2,501	0.894	46.5	46.5	0.826	0.928	0.544	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
43.8	241.1	1.59	0.66	sand	-36.8	48	5,037	2,460	2,553	0.885	42.7	42.7	0.817	0.921	0.539	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
44.78	335.4	1.79	0.53	gravelly sand to sand	-37.8	56	5,150	2,511	2,605	0.876	49.0	49.0	0.809	0.913	0.535	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
45.77	319.3	2.33	0.73	sand	-38.8	64	5,264	2,564	2,657	0.868	55.4	55.4	0.801	0.905	0.530	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
46.75	190.6	3.91	2.05	silty sand to sandy silt	-39.7	64	5,376	2,615	2,709	0.859	54.6	70.5	0.793	0.898	0.525	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
47.74	112.8	2.06	1.83	silty sand to sandy silt	-40.7	38	5,490	2,667	2,761	0.851	32.0	43.4	0.785	0.891	0.521	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
48.72	251.4	1.95	0.77	sand	-41.7	50	5,603	2,719	2,812	0.843	42.4	42.4	0.777	0.884	0.516	0.386	0.756	YES	0.0	28.4	1,200	N/A	0.891	0.106
49.7	170.2	0.62	0.37	sand	-42.7	34	5,716	2,770	2,864	0.836	28.4	28.4	0.769	0.878	0.511	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
50.69	246.9	1.56	0.63	sand	-43.7	49	5,829	2,822	2,916	0.828	40.9	40.9	0.761	0.871										

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	C-03
Ground Surf. Elevation	7.5 ft
GWT Depth During Testing, Z_w	12.0 ft
GWT Depth For Design, Z_{wd}	2.5 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_{ss}	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

REFERENCES

\+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ $CSR = 0.65\ A_{max}\ (\sigma_v/\sigma_v')\ r_d$

+++ $FS = (CRR_{7.5}/CSR)\ MSF\ K_\sigma\ K_\alpha$ -->>where K_α =1.0 and MSF 1.15

* S_v value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis asssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils = 10.00 feet

Earthquake-Induced Settlements:

- Liquefaction-Induced Settlement =	1.88 inches	<— Saturated Sands
- Seismic Compaction Settlement =	0.00 inches	<— Dry or Unsaturated Sands
Total:	1.88 inches	

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +														RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) σ_v' (psf)	Effective Vert. Stress (Testing) σ_v' (psf)	SPT Stress Correction Factor C_π	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy ?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.49	89.2	0.92	1.03	sand to silty sand	6.5	22	56	56	56	1.700	37.9	42.2	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	0.007	0.005	0.001
1.48	79.5	0.88	1.11	sand to silty sand	5.5	20	170	170	170	1.700	33.8	37.9	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.015	0.012	0.001
2.46	181.4	2.14	1.18	sand to silty sand	4.6	45	283	283	283	1.700	77.1	83.3	0.994	N/A	0.323	N/A	N/A	NO	N/A	N/A	N/A	0.013	0.004	0.000
3.44	179.1	2.2	1.23	sand to silty sand	3.6	45	396	337	396	1.700	76.1	82.3	0.992	1.000	0.379	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
4.43	173.5	2.16	1.24	sand to silty sand	2.6	43	509	389	509	1.700	73.7	79.8	0.990	1.000	0.421	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
5.41	138.9	1.51	1.09	sand to silty sand	1.6	35	622	441	622	1.700	59.0	64.4	0.987	1.000	0.453	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
6.4	72.2	1.03	1.42	silty sand to sandy silt	0.7	24	736	493	736	1.648	39.7	52.6	0.985	1.000	0.478	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
7.3	11.9	0.26	2.2	clayey silt to silty clay	-0.3	6	840	540	840	1.543	N/A	N/A	0.983	N/A	0.497	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
8.2	5	0.05	0.91	sensitive fine grained	-1.2	3	943	587	943	1.456	N/A	N/A	0.981	N/A	0.512	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
9.19	5.9	0.05	0.76	sensitive fine grained	-2.2	3	1,057	639	1,057	1.376	N/A	N/A	0.979	N/A	0.526	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
10.17	20.7	0.23	1.11	sandy silt to clayey silt	-3.2	8	1,170	691	1,170	1.308	N/A	N/A	0.976	N/A	0.537	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
11.15	47.7	0.18	0.37	sand to silty sand	-4.1	12	1,282	742	1,282	1.249	14.9	18.1	0.974	1.000	0.547	0.193	0.406	YES	1.3	16.2	823	N/A	1.692	0.201
12.14	38.7	0.17	0.43	silty sand to sandy silt	-5.2	13	1,396	795	1,387	1.201	15.5	23.6	0.972	1.000	0.555	0.266	0.552	YES	2.8	18.3	1,029	N/A	1.297	0.166
13.21	65.9	0.42	0.63	sand to silty sand	-6.2	16	1,519	851	1,444	1.177	19.4	22.8	0.969	1.000	0.562	0.254	0.520	YES	1.3	20.7	1,200	N/A	1.352	0.172
14.27	91.8	0.95	1.04	sand to silty sand	-7.3	23	1,641	907	1,499	1.155	26.5	30.3	0.967	1.000	0.569	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.696	0.083
15.26	48.8	0.14	0.28	sand to silty sand	-8.3	12	1,755	959	1,551	1.135	13.9	17.0	0.964	1.000	0.574	0.181	0.363	YES	1.3	15.2	719	N/A	1.771	0.208
16.24	20.4	0.1	0.5	silty sand to sandy silt	-9.2	7	1,868	1,010	1,603	1.117	7.6	14.1	0.962	1.000	0.578	0.151	0.301	YES	2.8	10.4	333	N/A	1.981	0.233
17.22	8.4	0.06	0.66	clayey silt to silty clay	-10.2	4	1,980	1,062	1,655	1.099	N/A	N/A	0.960	N/A	0.582	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
18.21	38	0.16	0.42	silty sand to sandy silt	-11.2	13	2,094	1,114	1,707	1.083	13.7	21.5	0.958	1.000	0.585	0.234	0.461	YES	2.8	16.5	851	N/A	1.451	0.171
19.19	45.3	0.31	0.68	silty sand to sandy silt	-12.2	15	2,207	1,165	1,758	1.067	16.1	24.3	0.955	1.000	0.588	0.279	0.546	YES	2.8	18.9	1,090	N/A	1.243	0.148
20.18	107.3	1.3	1.21	sand to silty sand	-13.2	27	2,321	1,217	1,810	1.051	28.2	32.0	0.953	1.000	0.590	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.488	0.057
21.16	95.4	1.14	1.2	sand to silty sand	-14.2	24	2,433	1,269	1,862	1.036	24.7	28.4	0.951	1.000	0.592	0.385	0.747	YES	1.3	26.1	1,200	N/A	0.917	0.109
22.15	83.4	0.72	0.86	sand to silty sand	-15.1	21	2,547	1,321	1,914	1.022	21.3	24.8	0.948	1.000	0.594	0.289	0.559	YES	1.3	22.6	1,200	N/A	1.206	0.142
23.13	46.4	0.62	1.34	silty sand to sandy silt	-16.1	15	2,660	1,373	1,965	1.009	15.6	23.7	0.946	1.000	0.596	0.269	0.519	YES	2.8	18.4	1,040	N/A	1.287	0.151
24.11	9.7	0.07	0.76	sandy silt to clayey silt	-17.1	4	2,773	1,424	2,017	0.996	N/A	N/A	0.944	N/A	0.597	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
25.1	8.8	0.06	0.64	sandy silt to clayey silt	-18.1	4	2,887	1,476	2,069	0.983	N/A	N/A	0.941	N/A	0.598	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
26.08	8.2	0.04	0.51	sandy silt to clayey silt	-19.1	3	2,999	1,528	2,121	0.971	N/A	N/A	0.939	N/A	0.599	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
27.07	7.9	0.02	0.27	sensitive fine grained	-20.1	4	3,113	1,580	2,173	0.959	N/A	N/A	0.937	N/A	0.600	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
28.05	8.8	0.03	0.36	sandy silt to clayey silt	-21.0	4	3,226	1,631	2,224	0.948	N/A	N/A	0.935	N/A	0.601	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
29.04	9.4	0.07	0.73	sandy silt to clayey silt	-22.0	4	3,340	1,684	2,276	0.937	N/A	N/A	0.932	N/A	0.601	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
30.02	11.4	0.25	2.16	clayey silt to silty clay	-23.0	6	3,452	1,735	2,328	0.927	N/A	N/A	0.930	N/A	0.601	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31	16.8	0.42	2.51	clayey silt to silty clay	-24.0	8	3,565	1,787	2,379	0.917	N/A	N/A	0.922	N/A	0.598	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31.99	10.5	0.21	2.01	clayey silt to silty clay	-25.0	5	3,679	1,839	2,431	0.907	N/A	N/A	0.914	N/A	0.594	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
32.97	20.4	0.63	3.07	clayey silt to silty clay	-26.0	10	3,792	1,890	2,483	0.897	N/A	N/A	0.906	N/A	0.590	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
33.96	21.5	0.86	3.98	silty clay to clay	-27.0	14	3,905	1,942	2,535	0.888	N/A	N/A	0.898	N/A	0.587	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
34.94	19.1	0.84	4.42	clay	-27.9	19	4,018	1,994	2,587	0.879	N/A	N/A	0.890	N/A	0.583	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
35.92	19.3	0.82	4.26	clay	-28.9	19	4,131	2,045	2,638	0.871	N/A	N/A	0.882	N/A	0.579	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
36.91	54.7	1.52	2.78	sandy silt to clayey silt	-29.9	22	4,245	2,097	2,690	0.862	N/A	N/A	0.874	N/A	0.575	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.157	0.019
37.89	198.1	0.75	0.38	sand	-30.9	40	4,357	2,149	2,742	0.854	33.8	33.8	0.866	0.972	0.570	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.065	0.008
38.88	215.7	1.06	0.49	sand	-31.9	43	4,471	2,201	2,794	0.846	36.5	36.5	0.858	0.962	0.566	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.060	0.007
39.86	219.2	0.82	0.38	sand	-32.9	44	4,584	2,253	2,845	0.838	36.8	36.8	0.850	0.954	0.562	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
40.85	319.8	2.3	0.72	sand	-33.8	64	4,698	2,305	2,898	0.831	53.1	53.1	0.841	0.945	0.557	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
41.83	275.2	3.38	1.23	sand	-34.8	55	4,810	2,356	2,949	0.824	45.3	45.3	0.833	0.937	0.553	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.011	0.001
42.81	241	1.84	0.76	sand	-35.8	48	4,923	2,408	3,001	0.816	39.4	39.4	0.826	0.928	0.549	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
43.8	346.9	2.04	0.59	gravelly sand to sand	-36.8	58	5,037	2,460	3,053	0.809	46.8	46.8	0.817	0.921	0.544	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
44.78	267.8	1.65	0.62	sand	-37.8	54	5,150	2,511	3,104	0.803	43.0	43.0	0.809	0.913	0.539	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	C-04
Ground Surf. Elevation	10.0 ft
GWT Depth During Testing, Z_w	12.0 ft
GWT Depth For Design, Z_{wd}	5.0 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_w	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

REFERENCES

+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ $CSR = 0.65\ A_{max}\ (\sigma_v/\sigma_v')\ r_d$

+++ $FS = (CRR_{7.5}/CSR)\ MSF\ K_\sigma\ K_\alpha$ -->> where K_α =1.0 and MSF 1.15

* S_v value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis asssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils = 13.77 feet

Earthquake-Induced Settlements:

- Liquefaction-Induced Settlement: 2.25 inches <— Saturated Sands
- Seismic Compaction Settlement = 0.01 inches <— Dry or Unsaturated Sands

Total: 2.26 inches

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +															RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) σ_v' (psf)	Effective Vert. Stress (Testing) σ_v' (psf)	SPT Stress Correction Factor C_N	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy ?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.49	120.5	1.08	0.89	sand to silty sand	9.0	30	56	56	56	1.700	51.2	56.2	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	0.006	0.003	0.000
1.48	52.9	0.96	1.81	silty sand to sandy silt	8.0	18	170	170	170	1.700	30.0	41.0	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.014	0.011	0.001
2.46	43.6	0.53	1.22	silty sand to sandy silt	7.1	15	283	283	283	1.700	24.7	34.6	0.994	N/A	0.323	N/A	N/A	NO	N/A	N/A	N/A	0.021	0.020	0.002
3.44	35.3	0.29	0.82	silty sand to sandy silt	6.1	12	396	396	396	1.700	20.0	29.0	0.992	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.029	0.033	0.004
4.43	140.7	1.38	0.98	sand	5.1	28	509	509	509	1.700	47.8	47.8	0.990	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.025	0.015	0.002
5.41	161.7	2.02	1.25	sand to silty sand	4.1	40	622	597	622	1.700	68.7	74.5	0.987	1.000	0.335	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
6.4	215.5	2.18	1.01	sand	3.2	43	736	649	736	1.648	71.0	71.0	0.985	1.000	0.363	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
7.3	207	2.95	1.42	sand to silty sand	2.3	52	840	696	840	1.543	79.9	86.2	0.983	1.000	0.385	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
8.2	185.2	2.19	1.18	sand to silty sand	1.3	46	943	743	943	1.456	67.4	73.2	0.981	1.000	0.404	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
9.19	80.5	1.46	1.81	silty sand to sandy silt	0.3	27	1,057	795	1,057	1.376	36.9	49.3	0.979	1.000	0.423	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
10.17	8	0.13	1.64	clayey silt to silty clay	-0.7	4	1,170	847	1,170	1.308	N/A	N/A	0.976	N/A	0.438	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
11.15	5.4	0.03	0.59	sensitive fine grained	-1.6	3	1,282	898	1,282	1.249	N/A	N/A	0.974	N/A	0.452	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
12.14	5.5	0.04	0.64	sensitive fine grained	-2.7	3	1,396	951	1,387	1.201	N/A	N/A	0.972	N/A	0.464	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
13.21	5.6	0.02	0.41	sensitive fine grained	-3.7	3	1,519	1,007	1,444	1.177	N/A	N/A	0.969	N/A	0.475	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
14.27	5.6	0.02	0.39	sensitive fine grained	-4.8	3	1,641	1,063	1,499	1.155	N/A	N/A	0.967	N/A	0.485	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
15.26	7	0.05	0.77	sensitive fine grained	-5.8	4	1,755	1,115	1,551	1.135	N/A	N/A	0.964	N/A	0.493	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
16.24	26	0.09	0.33	silty sand to sandy silt	-6.7	9	1,868	1,166	1,603	1.117	9.7	16.6	0.962	1.000	0.501	0.177	0.406	YES	2.8	12.5	475	N/A	1.798	0.211
17.22	44.9	0.27	0.6	silty sand to sandy silt	-7.7	15	1,980	1,218	1,655	1.099	16.5	24.7	0.960	1.000	0.507	0.287	0.651	YES	2.8	19.3	1,125	N/A	1.207	0.143
18.21	83.2	0.71	0.86	sand to silty sand	-8.7	21	2,094	1,270	1,707	1.083	22.5	26.1	0.958	1.000	0.513	0.315	0.707	YES	1.3	23.9	1,200	N/A	1.110	0.131
19.19	81	0.76	0.93	sand to silty sand	-9.7	20	2,207	1,321	1,758	1.067	21.6	25.1	0.955	1.000	0.518	0.295	0.653	YES	1.3	22.9	1,200	N/A	1.181	0.140
20.18	26.7	0.25	0.92	silty sand to sandy silt	-10.7	9	2,321	1,373	1,810	1.051	9.4	16.2	0.953	1.000	0.523	0.173	0.379	YES	2.8	12.2	449	N/A	1.828	0.215
21.16	34.5	0.16	0.45	silty sand to sandy silt	-11.7	12	2,433	1,425	1,862	1.036	11.9	19.3	0.951	1.000	0.528	0.207	0.451	YES	2.8	14.7	672	N/A	1.605	0.191
22.15	39.2	0.18	0.45	silty sand to sandy silt	-12.6	13	2,547	1,477	1,914	1.022	13.4	21.0	0.948	1.000	0.532	0.229	0.495	YES	2.8	16.2	816	N/A	1.481	0.174
23.13	76.5	0.61	0.8	sand to silty sand	-13.6	19	2,660	1,529	1,965	1.009	19.3	22.7	0.946	1.000	0.535	0.253	0.543	YES	1.3	20.6	1,200	N/A	1.359	0.160
24.11	79	0.74	0.94	sand to silty sand	-14.6	20	2,773	1,580	2,017	0.996	19.7	23.1	0.944	1.000	0.538	0.259	0.553	YES	1.3	21.0	1,200	N/A	1.331	0.158
25.1	61.7	1.04	1.68	silty sand to sandy silt	-15.6	21	2,887	1,632	2,069	0.983	20.2	29.3	0.941	1.000	0.541	0.423	0.900	YES	2.8	23.0	1,200	N/A	0.805	0.095
26.08	8	0.13	1.62	clayey silt to silty clay	-16.6	4	2,999	1,684	2,121	0.971	N/A	N/A	0.939	N/A	0.544	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
27.07	7.2	0.09	1.3	clayey silt to silty clay	-17.6	4	3,113	1,736	2,173	0.959	N/A	N/A	0.937	N/A	0.546	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
28.05	7	0.05	0.65	sensitive fine grained	-18.5	4	3,226	1,787	2,224	0.948	N/A	N/A	0.935	N/A	0.548	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
29.04	6.8	0.05	0.66	sensitive fine grained	-19.5	3	3,340	1,840	2,276	0.937	N/A	N/A	0.932	N/A	0.550	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
30.02	7.5	0.11	1.52	clayey silt to silty clay	-20.5	4	3,452	1,891	2,328	0.927	N/A	N/A	0.930	N/A	0.552	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31	8.7	0.13	1.54	clayey silt to silty clay	-21.5	4	3,565	1,943	2,379	0.917	N/A	N/A	0.922	N/A	0.550	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31.99	10.4	0.21	2.04	clayey silt to silty clay	-22.5	5	3,679	1,995	2,431	0.907	N/A	N/A	0.914	N/A	0.548	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
32.97	96.5	0.68	0.7	sand to silty sand	-23.5	24	3,792	2,046	2,483	0.897	21.7	25.2	0.906	0.992	0.545	0.296	0.619	YES	1.3	23.0	1,200	N/A	1.181	0.140
33.96	155.5	0.52	0.34	sand	-24.5	31	3,905	2,098	2,535	0.888	27.6	27.6	0.898	0.981	0.543	0.357	0.742	YES	0.0	27.6	1,200	N/A	1.005	0.118
34.94	31.4	0.39	1.23	silty sand to sandy silt	-25.4	10	4,018	2,150	2,587	0.879	9.2	16.0	0.890	0.984	0.540	0.171	0.357	YES	2.8	12.0	436	N/A	1.841	0.217
35.92	22.8	0.29	1.26	sandy silt to clayey silt	-26.4	9	4,131	2,201	2,638	0.871	N/A	N/A	0.882	N/A	0.538	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
36.91	24.3	0.37	1.54	sandy silt to clayey silt	-27.4	10	4,245	2,253	2,690	0.862	N/A	N/A	0.874	N/A	0.535	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
37.89	85.3	1.26	1.47	silty sand to sandy silt	-28.4	28	4,357	2,305	2,742	0.854	24.3	34.1	0.866	0.949	0.532	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.099	0.012
38.88	157.3	1.64	1.04	sand	-29.4	31	4,471	2,357	2,794	0.846	26.6	26.6	0.858	0.938	0.529	0.328	0.670	YES	0.0	26.6	1,200	N/A	1.076	0.127
39.86	226.6	2.22	0.97	sand	-30.4	46	4,584	2,409	2,845	0.838	38.3	38.3	0.850	0.928	0.525	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.028	0.003
40.85	221.2	1.91	0.86	sand	-31.3	44	4,698	2,461	2,898	0.831	36.8	36.8	0.841	0.920	0.522	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.054	0.006
41.83	214.8	1.61	0.75	sand	-32.3	43	4,810	2,512	2,949	0.824	35.4	35.4	0.833	0.913	0.519	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.076	0.009
42.81	307.1	3.88	1.26	sand	-33.3	61	4,923	2,564	3,001	0.816	50.1	50.1	0.826	0.905	0.515	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
43.8	162.3	3.59	2.21	silty sand to sandy silt	-34.3	54	5,037	2,616	3,053	0.809	43.8	57.5	0.817	0.898	0.512	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
44.78	47.6	1.72	3.62	clayey silt to silty clay	-35.3	24	5,150	2,667	3,104	0.803	N/A	N/A	0.809	N/A	0.508	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
45.77	53.3	1.92	3.6	clayey silt to silty clay	-36.3	27	5,264	2,720	3,156	0.796	N/A	N/A	0.801	N/A	0.504	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
46.75	46.9	1.55	3.31	clayey silt to silty clay	-37.2	23	5,376	2,771	3,208	0.790	N/A	N/A	0.793	N/A	0.500	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
47.74	39.3	1.74	4.43	silty clay to clay	-38.2	26	5,490	2,823	3,260	0.783	N/A	N/A	0.785	N/A	0.496	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
48.72	33.9	1.26	3.71	clayey silt to silty clay	-39.2	17	5,603	2,875	3,311	0.777	N/A	N/A	0.777	N/A	0.492	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
49.7	32.6	1.16	3.56	clayey silt to silty clay	-40.2	16	5,716	2,926	3,363	0.771	N/A	N/A	0.769	N/A	0.488	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
50.69	58.6	2.01	3.44	clayey silt to silty clay	-41.2	29	5,829	2,978	3,415	0.765	N/A	N/A	0.761	N/A	0.484	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	C-05
Ground Surf. Elevation	10.0 ft
GWT Depth During Testing, Z_w	12.0 ft
GWT Depth For Design, Z_{wd}	5.0 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_{w}	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

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+++ $FS = (CRR_{7.5}/CSR)\ MSF\ K_\sigma\ K_\alpha$ -->>where K_α =1.0 and MSF 1.15

* S_v value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis asssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils = 8.87 feet

Earthquake-Induced Settlements:

- Liquefaction-Induced Settlement: 1.72 inches <— Saturated Sands
- Seismic Compaction Settlement = 0.00 inches <— Dry or Unsaturated Sands

Total: 1.73 inches

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +															RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) $\sigma_{v'}$ (psf)	Effective Vert. Stress (Testing) $\sigma_{v'}$ (psf)	SPT Stress Correction Factor C_N	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy ?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.49	117.7	0.7	0.59	sand	9.0	24	56	56	56	1.700	40.0	40.0	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	0.007	0.005	0.001
1.48	86	0.9	1.05	sand to silty sand	8.0	22	170	170	170	1.700	36.6	40.8	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.014	0.011	0.001
2.46	84.2	1.01	1.2	sand to silty sand	7.1	21	283	283	283	1.700	35.8	40.0	0.994	N/A	0.323	N/A	N/A	NO	N/A	N/A	N/A	0.020	0.015	0.002
3.44	123.7	1.1	0.89	sand to silty sand	6.1	31	396	396	396	1.700	52.6	57.6	0.992	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.019	0.010	0.000
4.43	116.1	1.14	0.98	sand to silty sand	5.1	29	509	509	509	1.700	49.3	54.2	0.990	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.023	0.012	0.000
5.41	74.5	1.05	1.41	silty sand to sandy silt	4.1	25	622	597	622	1.700	42.2	55.7	0.987	1.000	0.335	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
6.4	111.4	0.99	0.89	sand to silty sand	3.2	28	736	649	736	1.648	45.9	50.6	0.985	1.000	0.363	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
7.3	103.1	1.23	1.19	sand to silty sand	2.3	26	840	696	840	1.543	39.8	44.2	0.983	1.000	0.385	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.073	0.009
8.2	81.6	1.1	1.34	sand to silty sand	1.3	20	943	743	943	1.456	29.7	33.6	0.981	1.000	0.404	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.099	0.012
9.19	48.9	0.79	1.61	silty sand to sandy silt	0.3	16	1,057	795	1,057	1.376	22.4	31.9	0.979	1.000	0.423	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
10.17	6.6	0.1	1.5	clayey silt to silty clay	-0.7	3	1,170	847	1,170	1.308	N/A	N/A	0.976	N/A	0.438	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
11.15	7.7	0.03	0.37	sensitive fine grained	-1.6	4	1,282	898	1,282	1.249	N/A	N/A	0.974	N/A	0.452	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
12.14	12.2	0.04	0.35	sandy silt to clayey silt	-2.7	5	1,396	951	1,387	1.201	N/A	N/A	0.972	N/A	0.464	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
13.21	11.5	0.04	0.31	sandy silt to clayey silt	-3.7	5	1,519	1,007	1,444	1.177	N/A	N/A	0.969	N/A	0.475	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
14.27	27.5	0.1	0.35	silty sand to sandy silt	-4.8	9	1,641	1,063	1,499	1.155	10.6	17.7	0.967	1.000	0.485	0.189	0.447	YES	2.8	13.4	550	N/A	1.716	0.204
15.26	44.9	0.32	0.72	silty sand to sandy silt	-5.8	15	1,755	1,115	1,551	1.135	17.0	25.4	0.964	1.000	0.493	0.300	0.699	YES	2.8	19.8	1,179	N/A	1.157	0.136
16.24	20.4	0.16	0.76	sandy silt to clayey silt	-6.7	8	1,868	1,166	1,603	1.117	N/A	N/A	0.962	N/A	0.501	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
17.22	30.7	0.1	0.32	silty sand to sandy silt	-7.7	10	1,980	1,218	1,655	1.099	11.3	18.5	0.960	1.000	0.507	0.198	0.448	YES	2.8	14.1	605	N/A	1.662	0.197
18.21	62.3	0.38	0.6	sand to silty sand	-8.7	16	2,094	1,270	1,707	1.083	16.9	20.2	0.958	1.000	0.513	0.218	0.488	YES	1.3	18.2	1,019	N/A	1.541	0.181
19.19	89.3	0.53	0.6	sand to silty sand	-9.7	22	2,207	1,321	1,758	1.067	23.8	27.5	0.955	1.000	0.518	0.352	0.780	YES	1.3	25.1	1,200	N/A	1.013	0.120
20.18	31.3	0.19	0.62	silty sand to sandy silt	-10.7	10	2,321	1,373	1,810	1.051	11.0	18.2	0.953	1.000	0.523	0.194	0.426	YES	2.8	13.8	581	N/A	1.688	0.198
21.16	36.9	0.15	0.41	silty sand to sandy silt	-11.7	12	2,433	1,425	1,862	1.036	12.7	20.3	0.951	1.000	0.528	0.219	0.478	YES	2.8	15.5	755	N/A	1.533	0.182
22.15	150.2	1.6	1.06	sand to silty sand	-12.6	38	2,547	1,477	1,914	1.022	38.4	42.7	0.948	1.000	0.532	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
23.13	187.5	2.71	1.44	sand to silty sand	-13.6	47	2,660	1,529	1,965	1.009	47.3	52.1	0.946	1.000	0.535	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
24.11	206.7	3.22	1.56	sand to silty sand	-14.6	52	2,773	1,580	2,017	0.996	51.5	56.4	0.944	1.000	0.538	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
25.1	228.1	3.34	1.47	sand to silty sand	-15.6	57	2,887	1,632	2,069	0.983	56.1	61.3	0.941	1.000	0.541	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
26.08	226.7	2.56	1.13	sand	-16.6	45	2,999	1,684	2,121	0.971	44.0	44.0	0.939	1.000	0.544	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
27.07	124	1.54	1.24	sand to silty sand	-17.6	31	3,113	1,736	2,173	0.959	29.7	33.7	0.937	1.000	0.546	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.149	0.017
28.05	52.6	0.6	1.15	silty sand to sandy silt	-18.5	18	3,226	1,787	2,224	0.948	16.6	25.0	0.935	1.000	0.548	0.291	0.610	YES	2.8	19.4	1,143	N/A	1.198	0.142
29.04	26	0.24	0.91	silty sand to sandy silt	-19.5	9	3,340	1,840	2,276	0.937	8.1	14.7	0.932	1.000	0.550	0.158	0.329	YES	2.8	10.9	367	N/A	1.935	0.228
30.02	19	0.12	0.64	sandy silt to clayey silt	-20.5	8	3,452	1,891	2,328	0.927	N/A	N/A	0.930	N/A	0.552	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31	12.7	0.08	0.66	sandy silt to clayey silt	-21.5	5	3,565	1,943	2,379	0.917	N/A	N/A	0.922	N/A	0.550	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31.99	16.8	0.14	0.83	sandy silt to clayey silt	-22.5	7	3,679	1,995	2,431	0.907	N/A	N/A	0.914	N/A	0.548	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
32.97	22.5	0.57	2.52	clayey silt to silty clay	-23.5	11	3,792	2,046	2,483	0.897	N/A	N/A	0.906	N/A	0.545	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
33.96	30	1	3.32	clayey silt to silty clay	-24.5	15	3,905	2,098	2,535	0.888	N/A	N/A	0.898	N/A	0.543	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
34.94	29.3	1.09	3.72	clayey silt to silty clay	-25.4	15	4,018	2,150	2,587	0.879	N/A	N/A	0.890	N/A	0.540	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
35.92	44.3	1.13	2.55	sandy silt to clayey silt	-26.4	18	4,131	2,201	2,638	0.871	N/A	N/A	0.882	N/A	0.538	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.060	0.007
36.91	211.4	1.12	0.53	sand	-27.4	42	4,245	2,253	2,690	0.862	36.5	36.5	0.874	0.953	0.535	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
37.89	254.1	1.83	0.72	sand	-28.4	51	4,357	2,305	2,742	0.854	43.4	43.4	0.866	0.945	0.532	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
38.88	382.1	1.97	0.52	gravelly sand to sand	-29.4	64	4,471	2,357	2,794	0.846	53.9	53.9	0.858	0.936	0.529	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
39.86	400.6	2.84	0.71	gravelly sand to sand	-30.4	67	4,584	2,409	2,845	0.838	56.0	56.0	0.850	0.928	0.525	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
40.85	337.3	3.37	1	sand	-31.3	67	4,698	2,461	2,898	0.831	56.0	56.0	0.841	0.920	0.522	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.075	0.009
41.83	215.2	1.43	0.66	sand	-32.3	43	4,810	2,512	2,949	0.824	35.4	35.4	0.833	0.913	0.519	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
42.81	309.1	2.04	0.66	sand	-33.3	62	4,923	2,564	3,001	0.816	50.5	50.5	0.826	0.905	0.515	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
43.8	320.9	2.44	0.76	sand	-34.3	64	5,037	2,616	3,053	0.809	51.9	51.9	0.817	0.898	0.512	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
44.78	300.7	2.03	0.67	sand	-35.3	60	5,150	2,667	3,104	0.803	48.3	48.3	0.809	0.891	0.508	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.215	0.025
45.77	203.6	1.04	0.51	sand	-36.3	41	5,264	2,720	3,156	0.796	32.4	32.4	0.801	0.884	0.504	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.447	0.053
46.75	198.9	1.65	0.83	sand	-37.2	40	5,376	2,771	3,208	0.790	31.4	31.4	0.793	0.878	0.500	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
47.74	331.2	3.75	1.13	sand	-38.2	66	5,490	2,823	3,260	0.783	51.9	51.9	0.785	0.871	0.496	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
48.72	353.3	2.3	0.65	gravelly sand to sand	-39.2	59	5,603	2,875	3,311	0.777	45.8	45.8	0.777	0.865	0.492	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
49.7	375.8	3.08	0.82	sand	-40.2	75	5,716	2,926	3,363	0.771	58.0	58.0	0.769	0.859	0.488	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
50.69	408	2.56	0.63	gravelly sand to sand	-41.2	68	5,829	2,978	3,415	0.765	52.0	52.0	0.761	0.853	0.484	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	C-06
Ground Surf. Elevation	12.0 ft
GWT Depth During Testing, Z_w	12.0 ft
GWT Depth For Design, Z_{wd}	7.0 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_{ea}	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

REFERENCES

\+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ $CSR = 0.65\ A_{max}\ (\sigma_v/\sigma_v')\ r_d$

+++ $FS = (CRR_{7.5}/CSR)\ MSF\ K_\sigma\ K_\alpha$ -->>where K_α =1.0 and MSF 1.15

* S_r value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis asssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils = 17.81 feet

Earthquake-Induced Settlements:

- Liquefaction-Induced Settlement	2.89 inches	<-- Saturated Sands
- Seismic Compaction Settlement =	0.00 inches	<-- Dry or Unsaturated Sands
Total:	2.89 inches	

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +														RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) $\sigma_{v'}$ (psf)	Effective Vert. Stress (Testing) $\sigma_{v'}$ (psf)	SPT Stress Correction Factor C_B	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy ?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.49	171.6	0.72	0.42	sand	11.0	34	56	56	56	1.700	58.3	58.3	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	0.006	0.003	0.000
1.48	117.7	1.2	1.02	sand to silty sand	10.0	29	170	170	170	1.700	50.0	54.9	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.012	0.006	0.000
2.46	145	1.35	0.93	sand	9.1	29	283	283	283	1.700	49.3	49.3	0.994	N/A	0.323	N/A	N/A	NO	N/A	N/A	N/A	0.017	0.011	0.001
3.44	133	1.59	1.2	sand to silty sand	8.1	33	396	396	396	1.700	56.5	61.7	0.992	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.019	0.009	0.000
4.43	114.6	1.47	1.28	sand to silty sand	7.1	29	509	509	509	1.700	48.7	53.5	0.990	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.023	0.013	0.000
5.41	110.9	1	0.9	sand to silty sand	6.1	28	622	622	622	1.700	47.1	51.9	0.987	N/A	0.321	N/A	N/A	NO	N/A	N/A	N/A	0.026	0.015	0.000
6.4	122.8	1.04	0.85	sand to silty sand	5.2	31	736	736	736	1.648	50.6	55.5	0.985	N/A	0.320	N/A	N/A	NO	N/A	N/A	N/A	0.027	0.014	0.000
7.3	165.8	1.45	0.87	sand	4.3	33	840	821	840	1.543	51.2	51.2	0.983	1.000	0.327	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
8.2	136.6	1.43	1.05	sand to silty sand	3.3	34	943	868	943	1.456	49.7	54.6	0.981	1.000	0.346	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
9.19	113.1	1.08	0.95	sand to silty sand	2.3	28	1,057	920	1,057	1.376	38.9	43.3	0.979	1.000	0.365	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
10.17	73.3	0.77	1.05	sand to silty sand	1.3	18	1,170	972	1,170	1.308	24.0	27.6	0.976	1.000	0.382	0.357	1.074	YES	1.3	25.3	1,200	N/A	0.477	0.056
11.15	22	0.37	1.66	sandy silt to clayey silt	0.4	9	1,282	1,023	1,282	1.249	N/A	N/A	0.974	N/A	0.397	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
12.14	39.5	0.25	0.63	silty sand to sandy silt	-0.7	13	1,396	1,075	1,387	1.201	15.8	24.0	0.972	1.000	0.410	0.273	0.766	YES	2.8	18.6	1,061	N/A	1.195	0.153
13.21	15.6	0.37	2.36	clayey silt to silty clay	-1.7	8	1,519	1,132	1,444	1.177	N/A	N/A	0.969	N/A	0.423	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
14.27	7.5	0.03	0.35	sensitive fine grained	-2.8	4	1,641	1,187	1,499	1.155	N/A	N/A	0.967	N/A	0.434	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
15.26	8.7	0.05	0.61	sandy silt to clayey silt	-3.8	3	1,755	1,239	1,551	1.135	N/A	N/A	0.964	N/A	0.444	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
16.24	7	0.05	0.64	sensitive fine grained	-4.7	4	1,868	1,291	1,603	1.117	N/A	N/A	0.962	N/A	0.452	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
17.22	27.9	0.25	0.9	silty sand to sandy silt	-5.7	9	1,980	1,343	1,655	1.099	10.2	17.3	0.960	1.000	0.460	0.184	0.459	YES	2.8	13.0	520	N/A	1.742	0.207
18.21	90.1	0.69	0.77	sand to silty sand	-6.7	23	2,094	1,395	1,707	1.083	24.4	28.1	0.958	1.000	0.467	0.371	0.914	YES	1.3	25.7	1,200	N/A	0.863	0.101
19.19	75.4	0.88	1.17	sand to silty sand	-7.7	19	2,207	1,446	1,758	1.067	20.1	23.6	0.955	1.000	0.474	0.266	0.646	YES	1.3	21.4	1,200	N/A	1.276	0.152
20.18	61.3	0.54	0.89	sand to silty sand	-8.7	15	2,321	1,498	1,810	1.051	16.1	19.4	0.953	1.000	0.480	0.208	0.498	YES	1.3	17.4	944	N/A	1.591	0.187
21.16	45.6	0.22	0.49	sand to silty sand	-9.7	11	2,433	1,550	1,862	1.036	11.8	14.9	0.951	1.000	0.485	0.159	0.377	YES	1.3	13.1	530	N/A	1.924	0.229
22.15	83.3	0.61	0.74	sand to silty sand	-10.6	21	2,547	1,602	1,914	1.022	21.3	24.8	0.948	1.000	0.490	0.288	0.676	YES	1.3	22.6	1,200	N/A	1.198	0.141
23.13	81.5	0.98	1.2	sand to silty sand	-11.6	20	2,660	1,653	1,965	1.009	20.6	24.0	0.946	1.000	0.495	0.274	0.637	YES	1.3	21.9	1,200	N/A	1.256	0.148
24.11	56.5	0.38	0.68	sand to silty sand	-12.6	14	2,773	1,705	2,017	0.996	14.1	17.2	0.944	1.000	0.499	0.183	0.423	YES	1.3	15.4	740	N/A	1.753	0.208
25.1	125.1	1.13	0.9	sand to silty sand	-13.6	31	2,887	1,757	2,069	0.983	30.7	34.7	0.941	1.000	0.503	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.084	0.010
26.08	196.9	2.38	1.21	sand to silty sand	-14.6	49	2,999	1,809	2,121	0.971	47.8	52.6	0.939	1.000	0.506	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
27.07	199.2	2.83	1.42	sand to silty sand	-15.6	50	3,113	1,861	2,173	0.959	47.8	52.6	0.937	1.000	0.509	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
28.05	192.7	2.44	1.27	sand to silty sand	-16.5	48	3,226	1,912	2,224	0.948	45.7	50.4	0.935	1.000	0.512	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
29.04	202.7	2.63	1.3	sand to silty sand	-17.5	51	3,340	1,964	2,276	0.937	47.5	52.3	0.932	1.000	0.515	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
30.02	205.2	2.76	1.34	sand to silty sand	-18.5	51	3,452	2,016	2,328	0.927	47.6	52.3	0.930	0.997	0.517	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
31	132.7	1	0.76	sand	-19.5	27	3,565	2,067	2,379	0.917	24.3	24.3	0.922	0.988	0.517	0.279	0.614	YES	0.0	24.3	1,200	N/A	1.239	0.147
31.99	34.7	0.09	0.27	silty sand to sandy silt	-20.5	12	3,679	2,119	2,431	0.907	10.5	17.6	0.914	0.986	0.515	0.187	0.412	YES	2.8	13.3	542	N/A	1.728	0.203
32.97	14.1	0.15	1.05	sandy silt to clayey silt	-21.5	6	3,792	2,171	2,483	0.897	N/A	N/A	0.906	N/A	0.514	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
33.96	20.3	0.19	0.91	sandy silt to clayey silt	-22.5	8	3,905	2,223	2,535	0.888	N/A	N/A	0.898	N/A	0.512	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
34.94	15.7	0.15	0.95	sandy silt to clayey silt	-23.4	6	4,018	2,275	2,587	0.879	N/A	N/A	0.890	N/A	0.511	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
35.92	26.7	0.48	1.8	sandy silt to clayey silt	-24.4	11	4,131	2,326	2,638	0.871	N/A	N/A	0.882	N/A	0.509	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
36.91	48.1	1.02	2.13	sandy silt to clayey silt	-25.4	19	4,245	2,378	2,690	0.862	N/A	N/A	0.874	N/A	0.507	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
37.89	94.2	1.28	1.36	sand to silty sand	-26.4	24	4,357	2,430	2,742	0.854	20.1	23.6	0.866	0.937	0.504	0.266	0.569	YES	1.3	21.4	1,200	N/A	1.291	0.153
38.88	200.5	1.46	0.73	sand	-27.4	40	4,471	2,482	2,794	0.846	33.9	33.9	0.858	0.917	0.502	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.096	0.011
39.86	209.7	1.68	0.8	sand	-28.4	42	4,584	2,533	2,845	0.838	35.2	35.2	0.850	0.910	0.500	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.076	0.009
40.85	226.1	1.29	0.57	sand	-29.3	45	4,698	2,586	2,898	0.831	37.6	37.6	0.841	0.902	0.497	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.038	0.004
41.83	173.3	0.48	0.28	sand	-30.3	35	4,810	2,637	2,949	0.824	28.5	28.5	0.833	0.895	0.494	0.390	0.813	YES	0.0	28.5	1,200	N/A	0.860	0.101
42.81	49.6	0.78	1.58	silty sand to sandy silt	-31.3	17	4,923	2,689	3,001	0.816	13.5	21.2	0.826	0.922	0.491	0.231	0.498	YES	2.8	16.3	830	N/A	1.463	0.174
43.8	108.8	0.63	0.58	sand	-32.3	22	5,037	2,741	3,053	0.809	17.6	17.6	0.817	0.906	0.488	0.188	0.400	YES	0.0	17.6	961	N/A	1.724	0.203
44.78	154.5	0.88	0.57	sand	-33.3	31	5,150	2,792	3,104	0.803	24.8	24.8	0.809	0.883	0.485	0.288	0.603	YES	0.0	24.8	1,200	N/A	1.194	0.142
45.77	147.9	1.18	0.8	sand	-34.3	30	5,264	2,844	3,156	0.796	23.5	23.5	0.801	0.880	0.482	0.266	0.558	YES	0.0	23.5	1,200	N/A	1.284	0.151
46.75	49.8	1.79	3.58	clayey silt to silty clay	-35.2	25	5,376	2,896	3,208	0.790	N/A	N/A	0.793	N/A	0.479	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
47.74	33.2	1.19	3.58	clayey silt to silty clay	-36.2	17	5,490	2,948	3,260	0.783	N/A	N/A	0.785	N/A	0.475	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
48.72	123.9	2.71	2.19	silty sand to sandy silt	-37.2	41	5,603	2,999	3,311	0.777	32.1	43.5	0.777	0.850	0.472	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
49.7	211.7	2.59	1.22	sand to silty sand	-38.2	53	5,716	3,051	3,363	0.771	40.8	45.3	0.769	0.845	0.468	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
50.69	226.7	2.97	1.31	sand to silty sand	-39.2	57	5,829	3,103	3,415	0.765	43.4	48.0	0.761	0.839	0.465	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	C-07
Ground Surf. Elevation	14.0 ft
GWT Depth During Testing, Z_w	13.6 ft
GWT Depth For Design, Z_{wd}	9.0 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_w	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

REFERENCES

\+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ $CSR = 0.65\, A_{max} (\sigma_v/\sigma_v')\, r_d$

+++ $FS = (CRR_{7.5}/CSR)\, MSF\, K_\sigma\, K_\alpha$ -->>where K_α =1.0 and MSF 1.15

* S_r value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis asssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils =	**14.86 feet**	
Earthquake-Induced Settlements:		
- Liquefaction-Induced Settlement	**3.46 inches**	<--- Saturated Sands
- Seismic Compaction Settlement =	**0.01 inches**	<--- Dry or Unsaturated Sands
Total:	**3.47 inches**	

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +														RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) $\sigma_{v'}$ (psf)	Effective Vert. Stress (Testing) $\sigma_{v'}$ (psf)	SPT Stress Correction Factor C_N	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy ?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.49	75.1	0.35	0.46	sand	13.0	15	56	56	56	1.700	25.5	25.5	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	0.009	0.012	0.001
1.48	83.6	0.6	0.72	sand to silty sand	12.0	21	170	170	170	1.700	35.5	39.7	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.014	0.011	0.001
2.46	83.6	0.6	0.72	sand	11.1	17	283	283	283	1.700	28.4	28.4	0.994	N/A	0.323	N/A	N/A	NO	N/A	N/A	N/A	0.024	0.028	0.003
3.44	162.1	1.03	0.64	sand to silty sand	10.1	41	396	396	396	1.700	68.9	74.7	0.992	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.017	0.006	0.000
4.43	122.3	1.13	0.93	sand to silty sand	9.1	31	509	509	509	1.700	52.0	57.0	0.990	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.022	0.011	0.000
5.41	130.5	1.05	0.8	sand to silty sand	8.1	33	622	622	622	1.700	55.5	60.6	0.987	N/A	0.321	N/A	N/A	NO	N/A	N/A	N/A	0.024	0.011	0.000
6.4	84.4	0.92	1.09	sand to silty sand	7.2	21	736	736	736	1.648	34.8	39.0	0.985	N/A	0.320	N/A	N/A	NO	N/A	N/A	N/A	0.033	0.027	0.003
7.3	108.7	1.18	1.08	sand	6.3	22	840	840	840	1.543	33.6	33.6	0.983	N/A	0.319	N/A	N/A	NO	N/A	N/A	N/A	0.038	0.037	0.004
8.2	145.2	1.06	0.73	sand to silty sand	5.3	36	943	943	943	1.456	52.9	57.9	0.981	N/A	0.319	N/A	N/A	NO	N/A	N/A	N/A	0.030	0.015	0.000
9.19	106.4	1.29	1.21	sand to silty sand	4.3	27	1,057	1,045	1,057	1.376	36.6	40.9	0.979	1.000	0.322	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
10.17	111.3	0.94	0.85	sand to silty sand	3.3	28	1,170	1,097	1,170	1.308	36.4	40.6	0.976	1.000	0.338	N/A	N/A	NO	N/A	N/A	N/A	0.000	0.000	0.000
11.15	101.9	0.91	0.89	sandy silt to clayey silt	2.4	41	1,282	1,148	1,282	1.249	N/A	N/A	0.974	N/A	0.354	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
12.14	45.3	0.51	1.12	silty sand to sandy silt	1.3	15	1,396	1,200	1,396	1.197	18.1	26.7	0.972	1.000	0.367	0.330	1.033	YES	2.8	20.9	1,200	N/A	0.576	0.074
13.21	14	0.18	1.32	clayey silt to silty clay	0.3	7	1,519	1,256	1,519	1.147	N/A	N/A	0.969	N/A	0.381	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
14.27	9.9	0.15	1.54	sensitive fine grained	-0.8	5	1,641	1,312	1,599	1.118	N/A	N/A	0.967	N/A	0.393	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
15.26	15.6	0.03	0.18	sandy silt to clayey silt	-1.8	6	1,755	1,364	1,651	1.101	N/A	N/A	0.964	N/A	0.403	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
16.24	18.2	0.05	0.29	sensitive fine grained	-2.7	9	1,868	1,416	1,703	1.084	N/A	N/A	0.962	N/A	0.412	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
17.22	17.5	0.04	0.23	silty sand to sandy silt	-3.7	6	1,980	1,467	1,754	1.068	6.2	12.5	0.960	1.000	0.421	0.136	0.370	YES	2.8	9.0	265	N/A	2.213	0.263
18.21	33.8	0.13	0.4	sand to silty sand	-4.7	8	2,094	1,519	1,806	1.052	8.9	11.8	0.958	1.000	0.429	0.129	0.347	YES	1.3	10.2	322	N/A	2.314	0.272
19.19	44.6	0.11	0.24	sand to silty sand	-5.7	11	2,207	1,571	1,858	1.038	11.6	14.6	0.955	1.000	0.436	0.156	0.412	YES	1.3	12.9	510	N/A	1.941	0.231
20.18	69.4	0.14	0.2	sand to silty sand	-6.7	17	2,321	1,623	1,910	1.023	17.8	21.1	0.953	1.000	0.443	0.230	0.597	YES	1.3	19.1	1,109	N/A	1.445	0.170
21.16	79.5	0.29	0.37	sand to silty sand	-7.7	20	2,433	1,675	1,962	1.010	20.1	23.5	0.951	1.000	0.449	0.265	0.680	YES	1.3	21.4	1,200	N/A	1.262	0.150
22.15	66.8	0.28	0.42	sand to silty sand	-8.6	17	2,547	1,727	2,014	0.997	16.6	19.9	0.948	1.000	0.455	0.215	0.543	YES	1.3	18.0	998	N/A	1.538	0.181
23.13	38.7	0.18	0.47	sand to silty sand	-9.6	10	2,660	1,778	2,065	0.984	9.5	12.5	0.946	1.000	0.460	0.136	0.339	YES	1.3	10.9	363	N/A	2.212	0.260
24.11	53.1	0.23	0.43	sand to silty sand	-10.6	13	2,773	1,830	2,117	0.972	12.9	16.0	0.944	1.000	0.465	0.170	0.422	YES	1.3	14.2	624	N/A	1.837	0.218
25.1	64.9	0.16	0.24	sand to silty sand	-11.6	16	2,887	1,882	2,169	0.960	15.6	18.8	0.941	1.000	0.469	0.201	0.493	YES	1.3	16.9	891	N/A	1.627	0.191
26.08	61.2	0.24	0.39	sand to silty sand	-12.6	15	2,999	1,933	2,220	0.949	14.5	17.7	0.939	1.000	0.473	0.189	0.458	YES	1.3	15.9	785	N/A	1.712	0.203
27.07	117.2	0.54	0.46	sand to silty sand	-13.6	29	3,113	1,985	2,273	0.938	27.5	31.3	0.937	1.000	0.477	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.356	0.042
28.05	212.5	1.45	0.68	sand to silty sand	-14.5	53	3,226	2,037	2,324	0.928	49.3	54.2	0.935	0.993	0.481	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
29.04	209.8	1.78	0.85	sand to silty sand	-15.5	52	3,340	2,089	2,376	0.917	48.1	52.9	0.932	0.983	0.484	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
30.02	193.3	1.5	0.77	sand to silty sand	-16.5	48	3,452	2,141	2,428	0.908	43.9	48.5	0.930	0.973	0.487	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
31	233.3	0.99	0.42	sand	-17.5	47	3,565	2,192	2,479	0.898	41.9	41.9	0.922	0.964	0.487	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
31.99	209.4	1.22	0.58	silty sand to sandy silt	-18.5	70	3,679	2,244	2,531	0.889	62.0	79.5	0.914	0.955	0.487	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
32.97	35.3	0.8	2.27	sandy silt to clayey silt	-19.5	14	3,792	2,296	2,583	0.880	N/A	N/A	0.906	N/A	0.486	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
33.96	25.8	0.34	1.33	sandy silt to clayey silt	-20.5	10	3,905	2,348	2,635	0.871	N/A	N/A	0.898	N/A	0.485	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
34.94	17.3	0.1	0.6	sandy silt to clayey silt	-21.4	7	4,018	2,399	2,686	0.863	N/A	N/A	0.890	N/A	0.484	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
35.92	24.2	0.13	0.53	sandy silt to clayey silt	-22.4	10	4,131	2,451	2,738	0.855	N/A	N/A	0.882	N/A	0.483	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
36.91	27.8	0.23	0.84	sandy silt to clayey silt	-23.4	11	4,245	2,503	2,790	0.847	N/A	N/A	0.874	N/A	0.481	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
37.89	56.6	0.57	1.01	sand to silty sand	-24.4	14	4,357	2,555	2,842	0.839	11.9	14.9	0.866	0.939	0.480	0.159	0.359	YES	1.3	13.2	535	N/A	1.919	0.228
38.88	125.9	0.71	0.57	sand	-25.4	25	4,471	2,607	2,894	0.831	20.9	20.9	0.858	0.913	0.478	0.227	0.500	YES	0.0	20.9	1,200	N/A	1.475	0.173
39.86	21.9	0.41	1.87	sand	-26.4	4	4,584	2,658	2,945	0.824	3.6	3.6	0.850	0.945	0.476	0.062	0.142	YES	0.0	3.6	98	N/A	4.795	0.570
40.85	92.9	0.96	1.03	sand	-27.3	19	4,698	2,710	2,997	0.817	15.2	15.2	0.841	0.915	0.474	0.162	0.359	YES	0.0	15.2	718	N/A	1.901	0.224
41.83	227.9	1.47	0.64	sand	-28.3	46	4,810	2,762	3,049	0.810	36.9	36.9	0.833	0.879	0.472	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.044	0.005
42.81	269.3	1.55	0.58	silty sand to sandy silt	-29.3	90	4,923	2,813	3,100	0.803	72.1	91.5	0.826	0.872	0.469	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
43.8	265.1	2.12	0.8	sand	-30.3	53	5,037	2,865	3,153	0.797	42.2	42.2	0.817	0.866	0.467	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
44.78	291.6	2.37	0.81	sand to silty sand	-31.3	73	5,150	2,917	3,204	0.790	57.6	62.9	0.809	0.860	0.464	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
45.77	297.2	2.89	0.97	sand to silty sand	-32.3	74	5,264	2,969	3,256	0.784	58.2	63.5	0.801	0.854	0.462	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
46.75	360.5	3.26	0.91	sand to silty sand	-33.2	90	5,376	3,021	3,308	0.778	70.1	75.9	0.793	0.848	0.459	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
47.74	358.1	2.83	0.79	sand	-34.2	72	5,490	3,073	3,360	0.772	55.3	55.3	0.785	0.842	0.456	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
48.72	329.7	4.72	1.43	sand to silty sand	-35.2	82	5,603	3,124	3,411	0.766	63.1	68.6	0.777	0.837	0.453	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
49.7	330.7	4.06	1.23	sand	-36.2	66	5,716	3,176	3,463	0.760	50.3	50.3	0.769	0.831	0.450	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
50.69	294.4	2.62	0.89	sand to silty sand	-37.2	74	5,829	3,228	3,515	0.754	55.5	60.7	0.761	0.826	0.447	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	C-08
Ground Surf. Elevation	7.5 ft
GWT Depth During Testing, Z_w	4.0 ft
GWT Depth For Design, Z_{wd}	2.5 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_{ts}	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

REFERENCES

\+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ CSR = 0.65 A_{max} (σ_v/σ_v') r_d

+++ FS = $(CRR_{7.5}/CSR)$ MSF K_σ K_α -->, where K_α =1.0 and MSF 1.15

* S_r value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis asssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils = 9.84 feet

Earthquake-Induced Settlements:

- Liquefaction-Induced Settlement	1.87 inches	<--- Saturated Sands
- Seismic Compaction Settlement =	0.00 inches	<--- Dry or Unsaturated Sands
Total:	1.87 inches	

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +														RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) σ_v' (psf)	Effective Vert. Stress (Testing) σ_v' (psf)	SPT Stress Correction Factor C_N	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy ?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.49	117	0.96	0.82	sand to silty sand	6.5	29	56	56	56	1.700	49.7	54.6	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	0.006	0.003	0.000
1.48	121.7	2.41	1.98	silty sand to sandy silt	5.5	41	170	170	170	1.700	69.0	87.8	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.009	0.003	0.000
2.46	47.1	0.42	0.88	silty sand to sandy silt	4.6	16	283	283	283	1.700	26.7	37.0	0.994	N/A	0.323	N/A	N/A	NO	N/A	N/A	N/A	0.021	0.018	0.002
3.44	35.9	0.21	0.58	silty sand to sandy silt	3.6	12	396	337	396	1.700	20.3	29.4	0.992	1.000	0.379	0.431	1.310	NO	N/A	N/A	N/A	N/A	0.162	0.019
4.43	10.8	0.27	2.46	clayey silt to silty clay	2.6	5	509	389	483	1.700	N/A	N/A	0.990	N/A	0.421	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
5.41	7.1	0.2	2.83	silty clay to clay	1.6	5	622	441	534	1.700	N/A	N/A	0.987	N/A	0.453	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
6.4	8.2	0.2	2.49	silty clay to clay	0.7	5	736	493	586	1.700	N/A	N/A	0.985	N/A	0.478	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
7.3	15.3	0.44	2.84	clayey silt to silty clay	-0.3	8	840	540	634	1.700	N/A	N/A	0.983	N/A	0.497	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
8.2	8.8	0.29	3.36	clay	-1.2	9	943	587	681	1.700	N/A	N/A	0.981	N/A	0.512	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
9.19	6.9	0.18	2.62	silty clay to clay	-2.2	5	1,057	639	733	1.652	N/A	N/A	0.979	N/A	0.526	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
10.17	7.4	0.22	2.95	silty clay to clay	-3.2	5	1,170	691	785	1.597	N/A	N/A	0.976	N/A	0.537	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
11.15	6.6	0.13	1.96	silty clay to clay	-4.1	4	1,282	742	836	1.547	N/A	N/A	0.974	N/A	0.547	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
12.14	19.2	0.13	0.66	sandy silt to clayey silt	-5.2	8	1,396	795	888	1.501	N/A	N/A	0.972	N/A	0.555	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
13.21	8	0.11	1.44	clayey silt to silty clay	-6.2	4	1,519	851	944	1.455	N/A	N/A	0.969	N/A	0.562	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
14.27	41.5	0.07	0.17	sand to silty sand	-7.3	10	1,641	907	1,000	1.414	14.7	17.9	0.967	1.000	0.569	0.190	0.385	YES	1.3	16.0	800	N/A	1.709	0.203
15.26	27.1	0.1	0.37	silty sand to sandy silt	-8.3	9	1,755	959	1,052	1.379	12.5	19.9	0.964	1.000	0.574	0.215	0.430	YES	2.8	15.3	725	N/A	1.560	0.183
16.24	22.6	0.13	0.56	silty sand to sandy silt	-9.2	8	1,868	1,010	1,104	1.346	10.1	17.2	0.962	1.000	0.578	0.183	0.363	YES	2.8	12.9	513	N/A	1.760	0.207
17.22	31.8	0.17	0.53	silty sand to sandy silt	-10.2	11	1,980	1,062	1,155	1.316	13.9	21.7	0.960	1.000	0.582	0.238	0.471	YES	2.8	16.7	875	N/A	1.430	0.170
18.21	17.1	0.17	1	sandy silt to clayey silt	-11.2	7	2,094	1,114	1,207	1.287	N/A	N/A	0.958	N/A	0.585	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
19.19	107	0.7	0.65	sand to silty sand	-12.2	27	2,207	1,165	1,259	1.260	33.7	37.8	0.955	1.000	0.588	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.041	0.005
20.18	168	1.19	0.71	sand	-13.2	34	2,321	1,217	1,311	1.235	41.5	41.5	0.953	1.000	0.590	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
21.16	180	1.31	0.73	sand	-14.2	36	2,433	1,269	1,363	1.212	43.6	43.6	0.951	1.000	0.592	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
22.15	153.7	1.13	0.73	sand	-15.1	31	2,547	1,321	1,415	1.189	36.6	36.6	0.948	1.000	0.594	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.066	0.008
23.13	86.1	0.9	1.04	sand to silty sand	-16.1	22	2,660	1,373	1,466	1.168	25.1	28.8	0.946	1.000	0.596	0.403	0.778	YES	1.3	26.5	1,200	N/A	0.866	0.102
24.11	19.6	0.27	1.37	sandy silt to clayey silt	-17.1	8	2,773	1,424	1,518	1.148	N/A	N/A	0.944	N/A	0.597	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
25.1	22	0.19	0.84	sandy silt to clayey silt	-18.1	9	2,887	1,476	1,570	1.129	N/A	N/A	0.941	N/A	0.598	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
26.08	21.4	0.34	1.58	sandy silt to clayey silt	-19.1	9	2,999	1,528	1,621	1.111	N/A	N/A	0.939	N/A	0.599	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
27.07	60.5	0.59	0.98	silty sand to sandy silt	-20.1	20	3,113	1,580	1,673	1.093	22.0	31.5	0.937	1.000	0.600	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.563	0.066
28.05	108.9	1.16	1.06	sand to silty sand	-21.0	27	3,226	1,631	1,725	1.077	29.3	33.2	0.935	1.000	0.601	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.202	0.024
29.04	174.9	1.28	0.73	sand	-22.0	35	3,340	1,684	1,777	1.061	37.1	37.1	0.932	1.000	0.601	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.055	0.007
30.02	109.5	0.99	0.9	sand to silty sand	-23.0	27	3,452	1,735	1,829	1.046	28.6	32.5	0.930	1.000	0.601	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.377	0.044
31	19.7	0.34	1.74	sandy silt to clayey silt	-24.0	8	3,565	1,787	1,880	1.031	N/A	N/A	0.922	N/A	0.598	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31.99	19.5	0.59	3.02	clayey silt to silty clay	-25.0	10	3,679	1,839	1,932	1.017	N/A	N/A	0.914	N/A	0.594	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
32.97	46.5	1.01	2.17	sandy silt to clayey silt	-26.0	19	3,792	1,890	1,984	1.004	N/A	N/A	0.906	N/A	0.590	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
33.96	119.4	0.72	0.6	sand	-27.0	24	3,905	1,942	2,036	0.991	23.7	23.7	0.898	1.000	0.587	0.268	0.525	YES	0.0	23.7	1,200	N/A	1.291	0.152
34.94	155.4	0.85	0.55	sand	-27.9	31	4,018	1,994	2,087	0.979	30.4	30.4	0.890	1.000	0.583	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.683	0.080
35.92	200.6	1.6	0.8	sand	-28.9	40	4,131	2,045	2,139	0.967	38.8	38.8	0.882	0.991	0.579	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.023	0.003
36.91	337.8	2.46	0.73	sand	-29.9	68	4,245	2,097	2,191	0.955	64.5	64.5	0.874	0.981	0.575	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
37.89	490.5	3.01	0.61	gravelly sand to sand	-30.9	82	4,357	2,149	2,243	0.944	77.2	77.2	0.866	0.972	0.570	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
38.88	345.7	1.34	0.39	gravelly sand to sand	-31.9	58	4,471	2,201	2,295	0.934	53.8	53.8	0.858	0.962	0.566	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
39.86	311.9	3.25	1.04	sand	-32.9	62	4,584	2,253	2,346	0.923	57.6	57.6	0.850	0.954	0.562	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
40.85	369.5	2.3	0.62	gravelly sand to sand	-33.8	62	4,698	2,305	2,398	0.913	56.2	56.2	0.841	0.945	0.557	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
41.83	430.5	3.39	0.79	sand	-34.8	86	4,810	2,356	2,450	0.904	77.8	77.8	0.833	0.937	0.553	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
42.81	512.9	4.99	0.97	sand	-35.8	103	4,923	2,408	2,501	0.894	91.7	91.7	0.826	0.928	0.549	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
43.8	450.3	6.11	1.36	sand	-36.8	90	5,037	2,460	2,553	0.885	79.7	79.7	0.817	0.921	0.544	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
44.78	167.9	1.94	1.16	sand to silty sand	-37.8	42	5,150	2,511	2,605	0.876	36.8	41.0	0.809	0.913	0.539	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.886	0.104
45.77	114.8	1.76	1.54	sand to silty sand	-38.8	29	5,264	2,564	2,657	0.868	24.9	28.6	0.801	0.911	0.535	0.392	0.769	YES	1.3	26.2	1,200	N/A	0.000	0.000
46.75	113.3	2.32	2.05	silty sand to sandy silt	-39.7	38	5,376	2,615	2,709	0.859	32.5	43.9	0.793	0.898	0.530	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
47.74	46.8	0.98	2.1	sandy silt to clayey silt	-40.7	19	5,490	2,667	2,761	0.851	N/A	N/A	0.785	N/A	0.525	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
48.72	60.7	0.86	1.42	silty sand to sandy silt	-41.7	20	5,603	2,719	2,812	0.843	17.1	25.5	0.777	0.909	0.521	0.302	0.606	YES	2.8	19.9	1,186	N/A	1.157	0.136
49.7	44.1	0.45	1.02	silty sand to sandy silt	-42.7	15	5,716	2,770	2,864	0.836	12.3	19.7	0.769	0.918	0.516	0.212	0.434	YES	2.8	15.1	708	N/A	1.572	0.187
50.69	50.4	0.84	1.66	silty sand to sandy silt	-43.7	17	5,829	2,822	2,916	0.828	13.9	21.7	0.761	0.908	0.511	0.238	0.486	YES	2.8	16.7	871	N/A	1.430	0.170

EVALUATION OF LIQUEFACTION POTENTIAL AND EARTHQUAKE-INDUCED GROUND SETTLEMENTS USING CPT DATA

GENERAL INPUT DATA

Project Name	Neptune Marina Apt
Location	Marina Del Rey, CA
GDC Project Name	L-618
Exploration No.	C-09
Ground Surf. Elevation	10.0 ft
GWT Depth During Testing, Z_w	4.0 ft
GWT Depth For Design, Z_{wd}	5.0 ft
Soil Unit Weight, γ_t	115 pcf
Earthquake Magnitude, M_{ss}	7.1
Peak Ground Acceleration, A_{max}	0.50 g
Required FS	1.25

REFERENCES

+ Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops (Edited by: T.L. Youd and I.M. Idriss, 2001)

++ $CSR = 0.65\ A_{max}\ (\sigma_v/\sigma_v')\ r_d$

+++ $FS = (CRR_{7.5}/CSR)\ MSF\ K_\sigma\ K_\alpha$ -->>, where K_α =1.0 and MSF 1.15

* S_v value based on extrapolated median curve and limited to a maximum value of 1,200 psf (Seed & Harder, 1990)

** Based on Tokimatsu and Seed (1987) and Pradel (1998).

Note: This analysis asssumes level ground condition and depth of liquefiable soils does not change.

SUMMARY OF RESULTS

Total Thickness of Liquefiable Soils = 10.81 feet

Earthquake-Induced Settlements:

- Liquefaction-Induced Settlement	1.68 inches	<-- Saturated Sands
- Seismic Compaction Settlement =	0.00 inches	<-- Dry or Unsaturated Sands
Total:	1.68 inches	

INPUT SOIL PROFILE					SOIL LIQUEFACTION POTENTIAL ANALYSIS (1996 NCEER & 1998 NCEER/NSF WORKSHOPS) +															RESIDUAL STRENGTH *			GROUND SETTLEMENT **		
Soil Depth Z (ft)	Average Cone Tip Resistance qt-avg (tsf)	Average Sleeve Friction fs-avg (tsf)	Average Friction Ratio Rf-avg (%)	Soil Behavior Type (Robertson et al., 1983)	Bottom of Layer Elevation (ft)	Equiv. SPT Blow Count N_{60}(blows/ft)	Total Vert. Stress (Design) σ_v (psf)	Effective Vert. Stress (Design) $\sigma_{v'}$ (psf)	Effective Vert. Stress (Testing) $\sigma_{v'}$ (psf)	SPT Stress Correction Factor C_R	Stress Corrected SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coeff. r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio ++ CSR	Cyclic Res. Ratio $CRR_{7.5}$	Factor of Safety Against Liqefaction +++ FS	Liquefy ?	SPT Blow Count Correction $N_{corr.}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Residual Shear Strength S_r (psf)	Cyclic Shear Strain γ_c (%)	Vol. Strain ε_v (%)	Layer Settlement S_i (in.)
0.49	98.6	0.27	0.27	sand	9.0	20	56	56	56	1.700	33.5	33.5	0.999	N/A	0.325	N/A	N/A	NO	N/A	N/A	N/A	0.008	0.007	0.001
1.48	109.9	0.38	0.34	sand	8.0	22	170	170	170	1.700	37.4	37.4	0.997	N/A	0.324	N/A	N/A	NO	N/A	N/A	N/A	0.015	0.013	0.001
2.46	184.5	0.7	0.38	sand	7.1	37	283	283	283	1.700	62.7	62.7	0.994	N/A	0.323	N/A	N/A	NO	N/A	N/A	N/A	0.015	0.007	0.000
3.44	231.1	0.88	0.38	sand	6.1	46	396	396	396	1.700	78.6	78.6	0.992	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.016	0.006	0.000
4.43	174.9	1.06	0.61	sand	5.1	35	509	509	483	1.700	59.5	59.5	0.990	N/A	0.322	N/A	N/A	NO	N/A	N/A	N/A	0.022	0.011	0.000
5.41	147	1.09	0.74	sand	4.1	29	622	597	534	1.700	50.0	50.0	0.987	1.000	0.335	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
6.4	142.1	1.01	0.71	sand	3.2	28	736	649	586	1.700	48.3	48.3	0.985	1.000	0.363	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
7.3	176.5	1.09	0.62	sand	2.3	35	840	696	634	1.700	60.0	60.0	0.983	1.000	0.385	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
8.2	187.5	1.24	0.66	sand	1.3	38	943	743	681	1.700	63.8	63.8	0.981	1.000	0.404	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
9.19	101.9	0.99	0.97	sand to silty sand	0.3	25	1,057	795	733	1.652	42.1	46.6	0.979	1.000	0.423	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
10.17	32.8	0.3	0.93	silty sand to sandy silt	-0.7	11	1,170	847	785	1.597	17.5	25.9	0.976	1.000	0.438	0.312	0.819	YES	2.8	20.3	1,200	N/A	1.071	0.126
11.15	11.4	0.03	0.25	sandy silt to clayey silt	-1.6	5	1,282	898	836	1.547	N/A	N/A	0.974	N/A	0.452	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
12.14	7.2	0.02	0.28	sensitive fine grained	-2.7	4	1,396	951	888	1.501	N/A	N/A	0.972	N/A	0.464	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
13.21	7.7	0.02	0.26	sensitive fine grained	-3.7	4	1,519	1,007	944	1.455	N/A	N/A	0.969	N/A	0.475	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
14.27	5.6	0.02	0.36	sensitive fine grained	-4.8	3	1,641	1,063	1,000	1.414	N/A	N/A	0.967	N/A	0.485	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
15.26	13.5	0.02	0.15	sandy silt to clayey silt	-5.8	5	1,755	1,115	1,052	1.379	N/A	N/A	0.964	N/A	0.493	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
16.24	49.3	0.02	0.04	sand to silty sand	-6.7	12	1,868	1,166	1,104	1.346	16.6	19.9	0.962	1.000	0.501	0.214	0.492	YES	1.3	17.9	992	N/A	1.360	0.183
17.22	75.9	0.27	0.35	sand to silty sand	-7.7	19	1,980	1,218	1,155	1.316	25.0	28.7	0.960	1.000	0.507	0.395	0.896	YES	1.3	26.3	1,200	N/A	0.855	0.102
18.21	81	0.28	0.35	sand to silty sand	-8.7	20	2,094	1,270	1,207	1.287	26.1	29.8	0.958	1.000	0.513	0.455	1.020	YES	1.3	27.4	1,200	N/A	0.707	0.083
19.19	28.9	0.11	0.39	silty sand to sandy silt	-9.7	10	2,207	1,321	1,259	1.260	12.1	19.6	0.955	1.000	0.518	0.210	0.466	YES	2.8	14.9	694	N/A	1.585	0.188
20.18	24.6	0.05	0.19	silty sand to sandy silt	-10.7	8	2,321	1,373	1,311	1.235	10.1	17.2	0.953	1.000	0.523	0.182	0.401	YES	2.8	12.9	512	N/A	1.761	0.207
21.16	107.6	0.39	0.37	sand	-11.7	22	2,433	1,425	1,363	1.212	26.1	26.1	0.951	1.000	0.528	0.315	0.686	YES	0.0	26.1	1,200	N/A	1.115	0.132
22.15	207.5	1.24	0.6	sand	-12.6	42	2,547	1,477	1,415	1.189	49.3	49.3	0.948	1.000	0.532	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
23.13	221.3	1.74	0.79	sand	-13.6	44	2,660	1,529	1,466	1.168	51.7	51.7	0.946	1.000	0.535	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
24.11	211.9	1.81	0.85	sand	-14.6	42	2,773	1,580	1,518	1.148	48.6	48.6	0.944	1.000	0.538	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
25.1	196.2	1.62	0.83	sand	-15.6	39	2,887	1,632	1,570	1.129	44.3	44.3	0.941	1.000	0.541	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.624	0.074
26.08	138.4	0.73	0.53	sand	-16.6	28	2,999	1,684	1,621	1.111	30.7	30.7	0.939	1.000	0.544	N/A	N/A	NO	N/A	N/A	N/A	N/A	1.132	0.133
27.07	47.7	0.39	0.82	silty sand to sandy silt	-17.6	16	3,113	1,736	1,673	1.093	17.4	25.9	0.937	1.000	0.546	0.310	0.653	YES	2.8	20.2	1,200	N/A	N/A	N/A
28.05	10	0.06	0.63	sandy silt to clayey silt	-18.5	4	3,226	1,787	1,725	1.077	N/A	N/A	0.935	N/A	0.548	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
29.04	9.6	0.04	0.36	sandy silt to clayey silt	-19.5	4	3,340	1,840	1,777	1.061	N/A	N/A	0.932	N/A	0.550	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
30.02	12.8	0.02	0.16	sandy silt to clayey silt	-20.5	5	3,452	1,891	1,829	1.046	N/A	N/A	0.930	N/A	0.552	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31	11.1	0.07	0.65	sandy silt to clayey silt	-21.5	4	3,565	1,943	1,880	1.031	N/A	N/A	0.922	N/A	0.550	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
31.99	10.2	0.08	0.8	sandy silt to clayey silt	-22.5	4	3,679	1,995	1,932	1.017	N/A	N/A	0.914	N/A	0.548	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
32.97	12.8	0.09	0.72	sandy silt to clayey silt	-23.5	5	3,792	2,046	1,984	1.004	N/A	N/A	0.906	N/A	0.545	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
33.96	14.2	0.09	0.64	sandy silt to clayey silt	-24.5	6	3,905	2,098	2,036	0.991	N/A	N/A	0.898	N/A	0.543	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
34.94	19.5	0.19	0.98	sandy silt to clayey silt	-25.4	8	4,018	2,150	2,087	0.979	N/A	N/A	0.890	N/A	0.540	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
35.92	26.9	0.41	1.52	sandy silt to clayey silt	-26.4	11	4,131	2,201	2,139	0.967	N/A	N/A	0.882	N/A	0.538	N/A	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A
36.91	103.5	1.03	0.99	sand to silty sand	-27.4	26	4,245	2,253	2,191	0.955	24.7	28.4	0.874	0.956	0.535	0.385	0.791	YES	1.3	26.1	1,200	N/A	0.909	0.107
37.89	82.2	1.57	1.91	silty sand to sandy silt	-28.4	27	4,357	2,305	2,243	0.944	25.9	36.1	0.866	0.947	0.532	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.067	0.008
38.88	117	3.06	2.62	silty sand to sandy silt	-29.4	39	4,471	2,357	2,295	0.934	36.4	48.7	0.858	0.936	0.529	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
39.86	301.6	3.29	1.09	sand	-30.4	60	4,584	2,409	2,346	0.923	55.7	55.7	0.850	0.928	0.525	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
40.85	273.9	3.29	1.2	sand	-31.3	55	4,698	2,461	2,398	0.913	50.0	50.0	0.841	0.920	0.522	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
41.83	304.2	1.92	0.63	sand	-32.3	61	4,810	2,512	2,450	0.904	55.0	55.0	0.833	0.913	0.519	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
42.81	254.4	1.66	0.65	sand	-33.3	51	4,923	2,564	2,501	0.894	45.5	45.5	0.826	0.905	0.515	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.862	0.101
43.8	161.8	1.25	0.77	sand	-34.3	32	5,037	2,616	2,553	0.885	28.6	28.6	0.817	0.898	0.512	0.394	0.796	YES	0.0	28.6	1,200	N/A	0.538	0.064
44.78	177	0.66	0.38	sand	-35.3	35	5,150	2,667	2,605	0.876	31.0	31.0	0.809	0.891	0.508	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.086	0.010
45.77	239.4	0.9	0.37	gravelly sand to sand	-36.3	40	5,264	2,720	2,657	0.868	34.6	34.6	0.801	0.884	0.504	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.000	0.000
46.75	344.9	1.7	0.49	gravelly sand to sand	-37.2	57	5,376	2,771	2,709	0.859	49.4	49.4	0.793	0.878	0.500	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.537	0.063
47.74	76	1.01	1.33	silty sand to sandy silt	-38.2	25	5,490	2,823	2,761	0.851	21.6	30.9	0.785	0.887	0.496	N/A	N/A	NO	N/A	N/A	N/A	N/A	0.834	0.098
48.72	70.3	0.84	1.19	silty sand to sandy silt	-39.2	23	5,603	2,875	2,812	0.843	19.8	28.7	0.777	0.886	0.492	0.397	0.822	YES	2.8	22.6	1,200	N/A	0.834	0.098

APPENDIX D
Lateral Spreading Analysis

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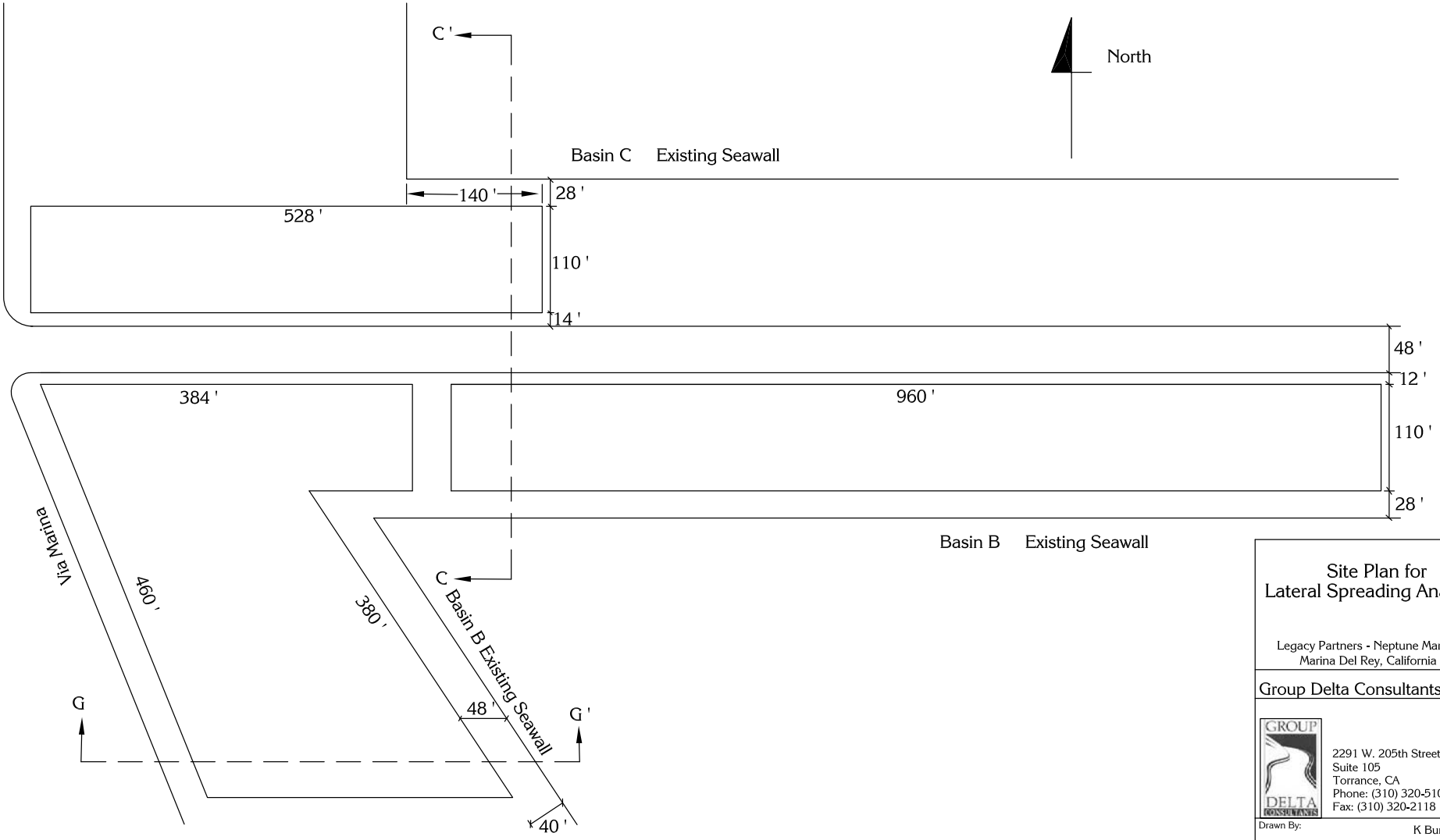

Site Plan for Lateral Spreading Analysis

Legacy Partners - Neptune Marina
Marina Del Rey, California

Group Delta Consultants, Inc.

2291 W. 205th Street
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Torrance, CA
Phone: (310) 320-5100
Fax: (310) 320-2118

Drawn By:	K Burlingham
Approved By:	Y Liu
Date:	7/27/05
Revised:	
Scale:	1" = 100 '
Project Number:	L-618
Figure Number:	D-1

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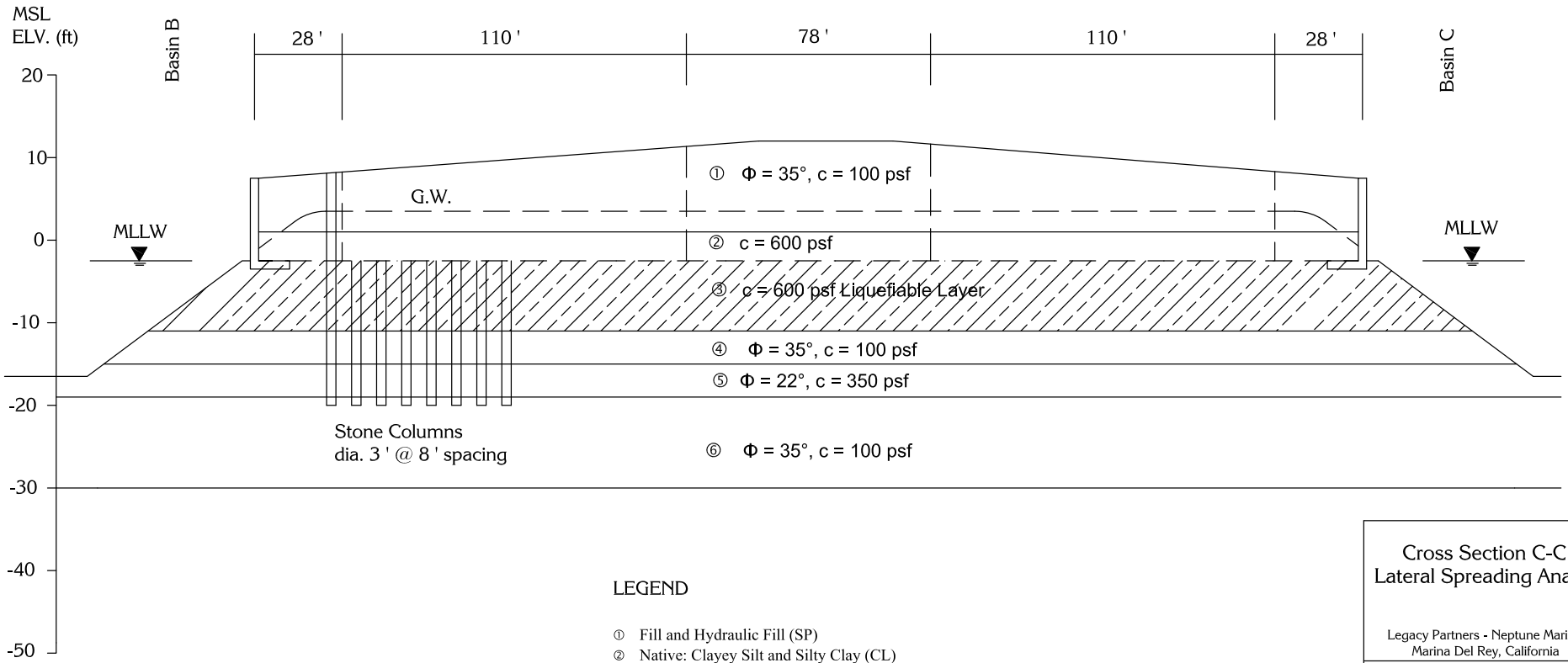

LEGEND

① Fill and Hydraulic Fill (SP)
② Native: Clayey Silt and Silty Clay (CL)
③ Silty Sand and Sandy Silt (SM)
④ Sand (SP)
⑤ Silty Clay and Clayey Silt (ML-CL)
⑥ Sand (SP)

Cross Section C-C '
Lateral Spreading Analysis

Legacy Partners - Neptune Marina
Marina Del Rey, California

Group Delta Consultants, Inc.

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Suite 105
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Drawn By:	K Burlingham
Approved By:	Y Liu
Date:	7/26/05
Revised:	
Scale:	V: 1" = 12.5 ' H: 1" = 33 '
Project Number:	L-618
Figure Number:	D-2

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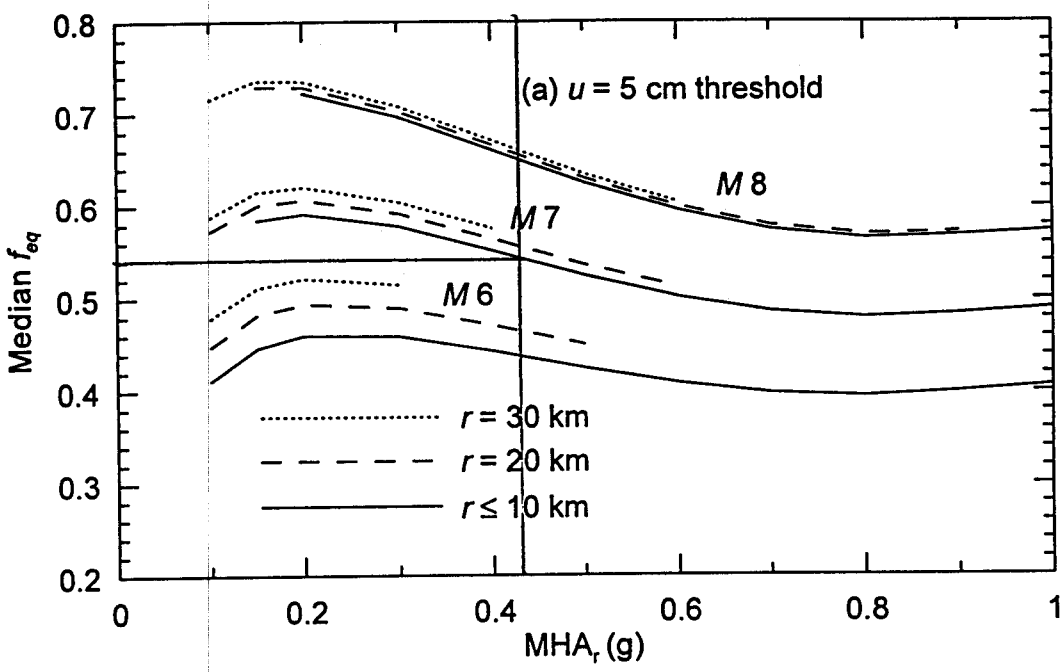
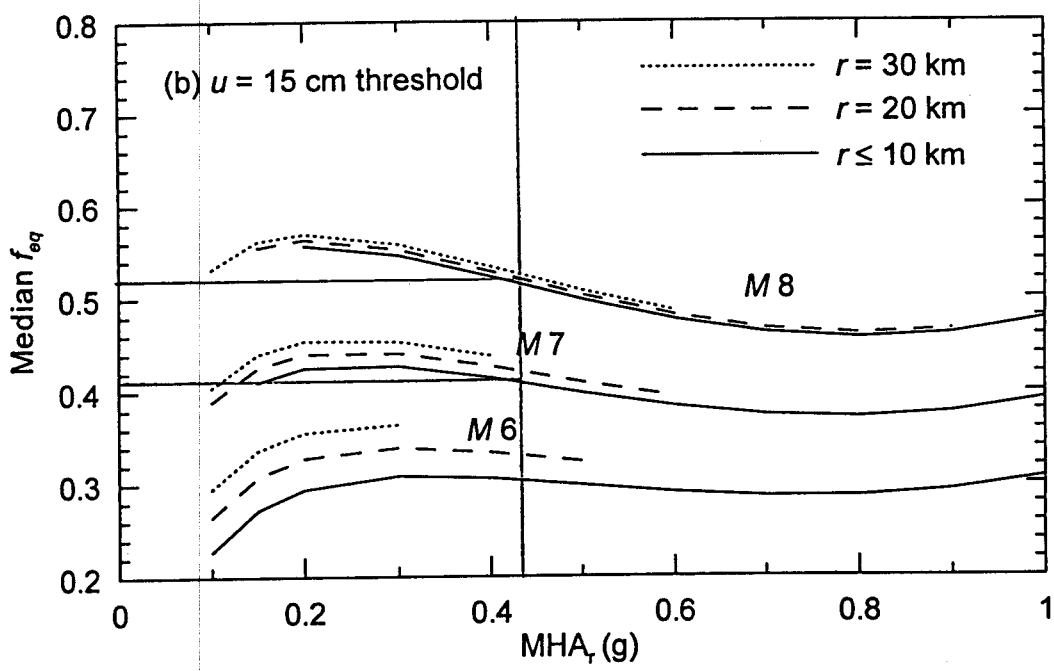


$k_{eq} = 0.43 \times 0.54$
$= 0.23$



$k_{eq} = 0.41 \times 0.43$
$= 0.18.$

Figure 11.1. Required Values of f_{eq} as Function of MHA_r and Seismological Condition for Threshold Displacements of (a) 5 cm and (b) 15 cm

Averaged Shear Strength Parameters

For dia' 2' @ 6' spacing

$$Ar = \frac{\pi d^2}{4 s^2 \cos 30^\circ} = \frac{3.14 \times 2^2}{4 \times 6^2 \times 0.87} = \frac{12.56}{125.28} = 0.1$$

$d = 2'$
$s = 6'$

$$C_{ave} = C_c (1 - Ar) = 100 \text{ psf} (1 - 0.1) = 90 \text{ psf}$$

$$\gamma_{avg} = (1 - Ar)\gamma_c + Ar \gamma_s = (1 - 0.1) \times 120 + 0.1 \times 140$$
$$= 108 + 14 = 122 \text{ pcf};$$

$$S_{rv} = \frac{\sigma_s}{\sigma_c} = \frac{140}{120} = 1.17$$

$$S_r = 1 + (S_{rv} - 1)\cos\alpha = 1 + 0.17 = 1.17;$$

$$\tan\phi'_{ave} = \frac{(1 - 0.1)\tan\phi_c + S_r Ar \tan\phi_s}{1 + Ar(S_r - 1)} = \frac{1.17 \times 0.1 \times 0.83 + 0.58}{1 + 0.1 \times 0.17} = 0.665;$$

$$\phi'_{avg} = 34^\circ$$

For dia 2.5 @ 7' spacing

$$Ar = \frac{3.14 \times 2.5^2}{4 \times 7^2 \times 0.87} = 0.115;$$

$$C_{ave} = 100(1 - 0.115) = 88.5 \text{ psf}$$

$$\gamma_{avg} = (1 - 0.115) \times 120 + 0.115 \times 140 = 122.3 \text{ pcf}$$

$$\tan\phi'_{avg} = \frac{(1 - 0.115)\tan 33^\circ + 1.17 \times 0.115 \times \tan 40^\circ}{1 + 0.115(1.17 - 1)} = \frac{0.575 + 0.113}{1.02} = 0.675$$

$$\phi'_{avg} = 34^\circ$$

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CHECKED BY _____

PROJECT NUMBER _____ DATE _____ PAGE _____ OF _____

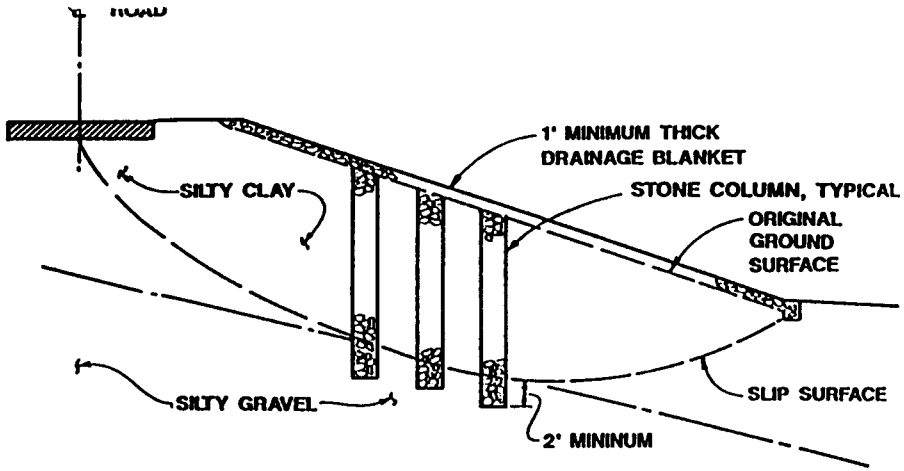

Figure 7.40 Schematic diagram showing stone columns to stabilize an unstable slope.

shear resistance of the soil along a potential slip surface by replacing or displacing the in situ soil with a series of closely spaced, large-diameter columns of compacted stone (Figure 7.40). In addition, stone columns also function as efficient gravel drains by providing a path for relief of pore water pressures, thereby increasing the strength of the surrounding clayey soils.

Construction of stone columns consists of:

(1) Forming a vertical hole in the underlying material, using either the vibro-replacement or vibro-displacement technique.
(2) Placing stone in the preformed hole from the ground surface, as in the vibro-replacement technique, or by means of bottom feed equipment, as in the vibro-displacement technique.
(3) Compacting the stone by repenetration of each lift with the vibroflot, a process that drives the stone laterally to the sidewalls of the hole and thus enlarges the hole.

Review of case histories and discussions with specialty contractors by Bachus and Barksdale (1989) indicate that the stone column technique is more suitable for subsurface soils whose shear strengths range from 200 to 1,000 pounds per square foot. Soils weaker than the lower limit may not provide sufficient lateral support for the stone fill, thus causing large stone consumption and/or excessive deformation. For soil strenght approaching the upper limit, stone columns may not be needed.

Special care should be exercised when stone columns are used in sensitive or organic soils (Bachus and Barksdale, 1989). In sensitive soils, construction should proceed quickly to minimize the amount of vibration to the soils. Peaty soils, in which the layer thickness is greater than one to two vibroflot diameters, should be avoided because of documented poor performance and construction problems.

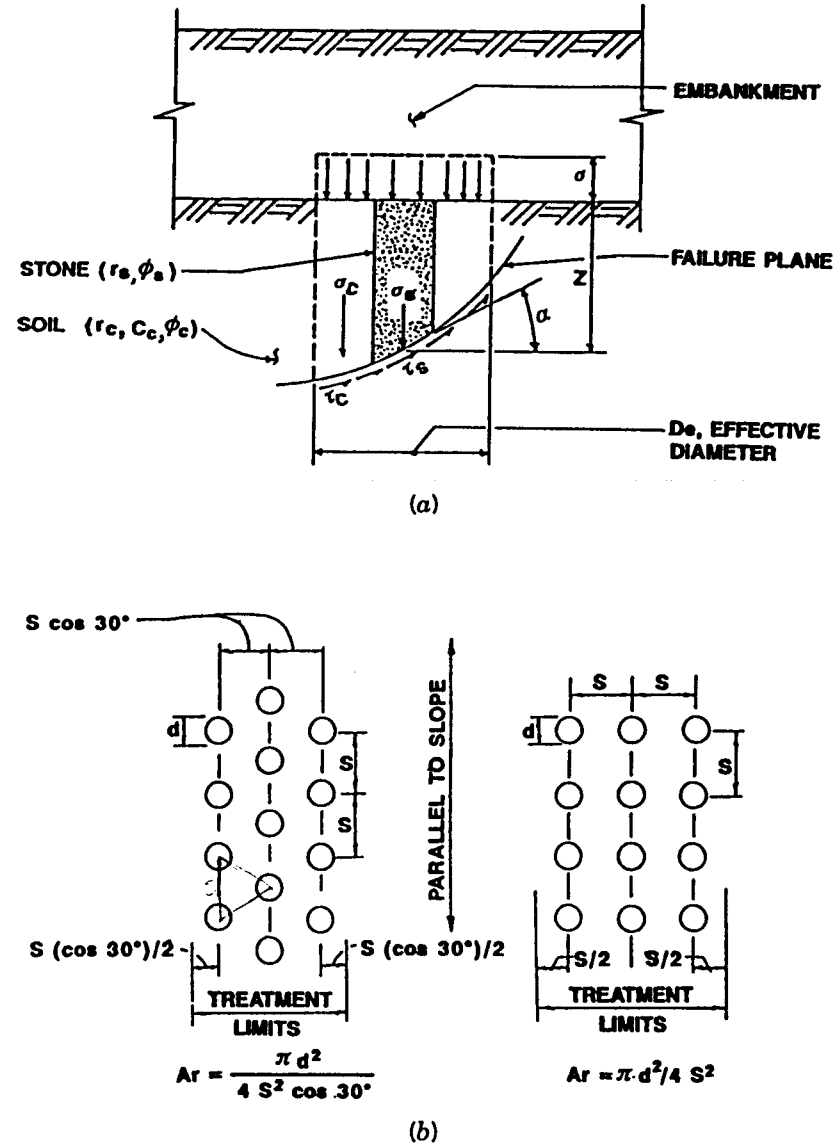

Figure 7.41 Design methodology of stone columns. (*a*) Definition sketch for Japanese method. (*b*) Definition of stone column treatment limits. (From Goughnour et al., 1990, copyright © ASTM, reprinted with permission.)

Two empirical methods are available for the design of stone columns. The first is based on the technique developed in Japan (Aboshi et al., 1979) for sand columns. The second is called the average strength parameter method (Goughnour et al., 1990). Figure 7.41 illustrates the design methodology for stone-columns by defining an average shear strength that can be applied to the stone-column treated soil. Stability

calculations are then carried out by using conventional slope stability analysis methods. The basic equations for developing average shear strength values are

(1) *Japanese Method*

$$\tau_{ave} = (1 - A_r)\tau_c + A_r \tau_s \cos\alpha \qquad \text{(Eq. 7-2)}$$

(2) *Average Strength Parameters Method*

$$\begin{aligned} C_{ave} &= C_c(1 - A_r) + c_s A_r \\ &= C_c(1 - A_r) \qquad \text{(Eq. 7-3)} \\ (c_s &= 0 \quad \text{for stone column}) \\ \tan\phi_{ave} &= \frac{(1 - A_r)\tan\phi_c + S_r A_r \tan\phi_s}{1 + A_r(S_r - 1)} \qquad \text{(Eq. 7-4)} \\ S_r &= 1 + (S_{rv} - 1)\cos\alpha \qquad \text{(Eq. 7-5)} \\ \gamma_{ave} &= (1 - A_r)\gamma_c + A_r \gamma_s \qquad \text{(Eq. 7-6)} \end{aligned}$$

where c_{ave} = average cohesion to be used for the treated soil
c_c = cohesion of the in situ soil
c_s = cohesion of stone
τ_{ave} = average weighted shear strength within the area tributary to the stone column
S_r = stress ratio appropriate to the orientation of the failure surface at that location
$S_{rv} = \sigma_s/\sigma_c$, stress ratio or vertical stress in the stone column divided by that in the in situ soil
$A_r = \pi d^2/4S^2$ for square array and
$\pi d^2/(4S^2 \cos 30°)$ for triangular array
τ_c = shear strength of the in situ soil
τ_s = shear strength of the stone column
σ_s = effective vertical stress due to weight of column ($\tau_s z$) and applied loading $\sigma = \tau_s z + s\mu_s$
σ_c = vertical stress in the in situ soil
α = angle of inclination of the failure surface from the horizontal
$\mu_s = S_{rv}/(1 + (S_{rv} - 1)A_r)$
ϕ_s = internal friction angle of the stone
ϕ_c = internal friction angle of the in situ soil
ϕ_{ave} = average internal friction angle of the treated soil
γ_{ave} = average unit weight of the treated soil
γ_c = unit weight of in situ soil
γ_s = unit weight of stone

TABLE 7.5 Case Histories of Stone Columns used for Highway Slope Stabilization

Location	Diameter (feet)	Spacing (feet)	Construction Method
Steel Bayou Bridge, Route 465, Mississippi	3	5	Wet vibro-flotation
Nemadji River Bridge, Superior, Wisconsin	3.5	6 to 7	Preaugering holes
Route 22, New York	3.5	6	Dry displacement method using bottom feed equipment

Source: Goughnour et al. (1990).

Stabilization of highway slopes by means of stone columns has been used in Alaska, California, Florida, Iowa, Kentucky, Mississippi, New York, South Dakota, Texas, Virginia, and Wisconsin. Table 7.5 lists a few case histories of the application of stone columns in highway slope stabilization. See Xanthakos et al. (1994) for more examples.

7.5.3 Reticulated Micropiles

Reticulated micropiles were developed in Italy and are used to create a monolithic rigid block of reinforced soil to a depth below the critical failure surface (Figure 7.42). The piles used in this way are similar to soil nailing systems. The major difference between the reticulated micropiles and soil nailing is that the behavior of micropiles is influenced significantly by their geometric arrangement. Field and model tests (Lizzi, 1985) have demonstrated that the group and network effect of a reticulated micropile system provides higher load bearing and shearing capacities than those of closely spaced vertical piles. Because of the great length of the piles as compared with their

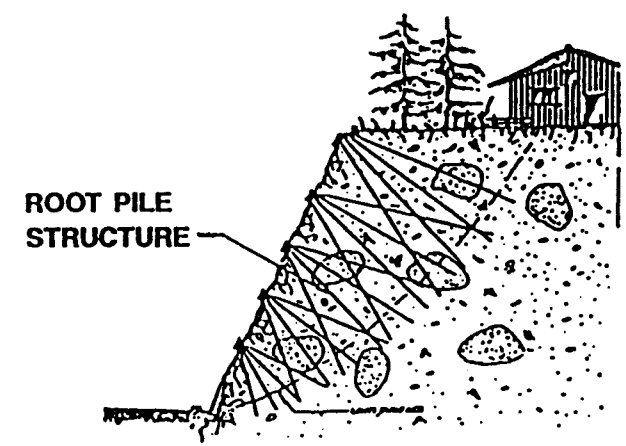

Figure 7.42 Reticulated micropiles used to stabilize slopes. (Lizzi, 1985.)

L-618 Neptune Marina Apts Lateral Spreading: Before Improvement

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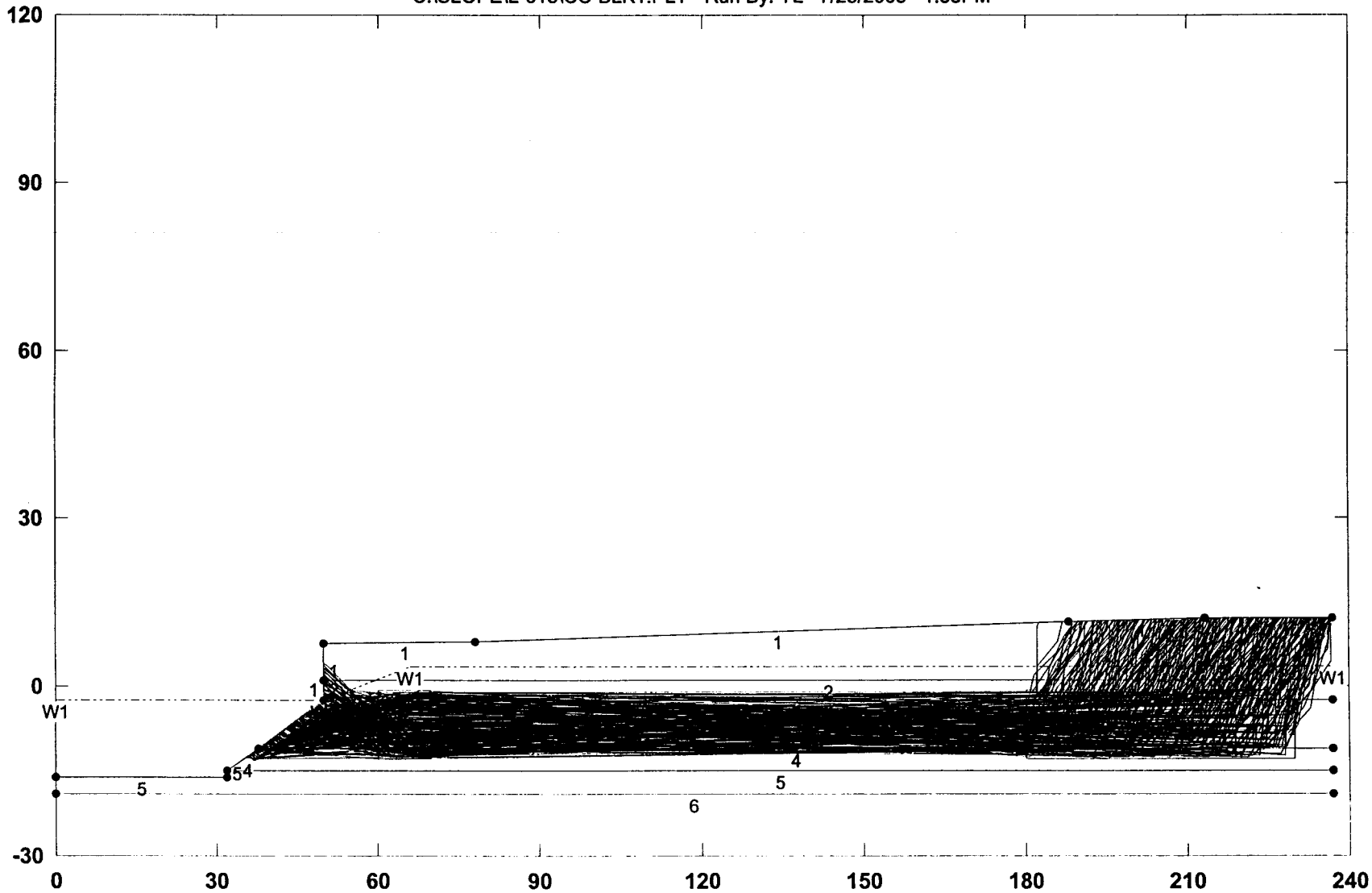

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L-618 Neptune Marina Apts Lateral Spreading: Before Improvement

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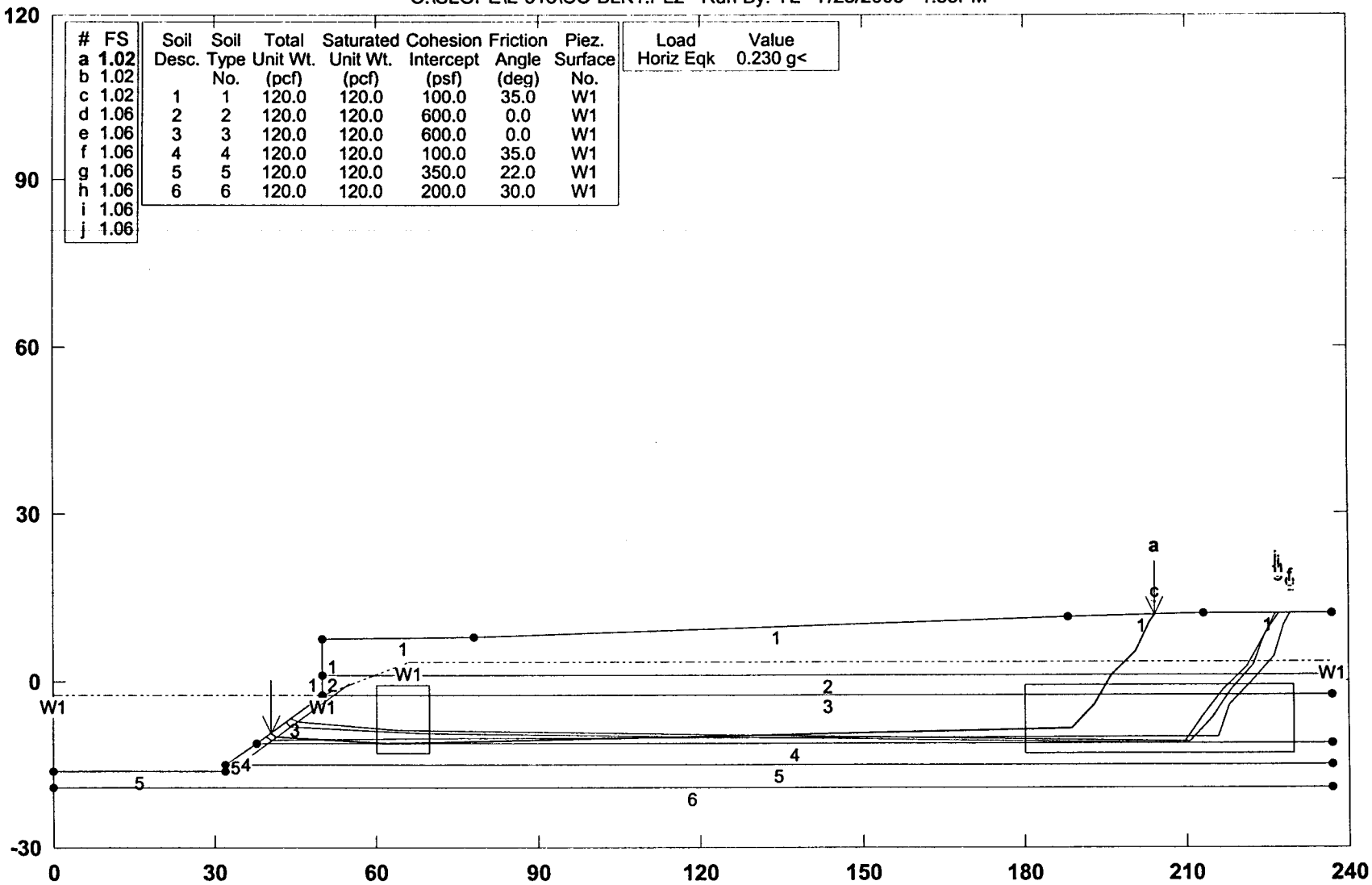
#	FS
a	1.02
b	1.02
c	1.02
d	1.06
e	1.06
f	1.06
g	1.06
h	1.06
i	1.06
j	1.06

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1	1	120.0	120.0	100.0	35.0	W1
2	2	120.0	120.0	600.0	0.0	W1
3	3	120.0	120.0	600.0	0.0	W1
4	4	120.0	120.0	100.0	35.0	W1
5	5	120.0	120.0	350.0	22.0	W1
6	6	120.0	120.0	200.0	30.0	W1

Load	Value
Horiz Eqk	0.230 g<



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Safety Factors Are Calculated By The Modified Janbu Method

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TABLE 1

ESTIMATION OF PERMANENT SEISMIC DISPLACEMENT USING NEWMARK RIGID-SLIDING-BLOCK METHOD SIMPLIFIED PROCEDURE (BRAY AND RATHJE, 1998)

PROJECT NAME: Lateral Spreading Analysis for Neptune Marina Apts: Before Ground Improvement
PROJECT NO.: L-618
PROJECT SITE: Parcel 10R, Marquesas Way and Via Marina

CALCULATED BY: Ying Liu
DATE: 25-Jul-05

INPUT PARAMETERS:

Yield Acceleration, ky (g):	0.23		Normalized MHEA Sigma:	0	
Vertical Thickness, h (m):	6		Mean Period Sigma:	0	
Shear Wave Vel., Vs (m/s):	189	*	Significant Duration Sigma:	0	
Earthquake Magnitude, M:	7.10	*	Normalized Displacement Sigma:	0	
Earthquake Accel., Rock (g):	0.5	**			
Earthquake Distance, r (km):	7		Allowable screen displacement (cm):	5	*

CALCULATIONS:

Site Period (s):	0.127
NRF Factor:	0.921
Mean Period (s):	0.518
Duration, D05-95 (s):	15.226
Ts/Tm:	0.2453
MHEA/MHA*NRF:	1.000
MHEA, kmax:	0.4607
ky/kmax:	0.4993
Normalized Disp. (cm/sec):	1.3617

* Provided or required by LADWP
** Adjusted MHAr for a seismic coefficient of 0.3 that is required by LADWP

Estimated Displacement (cm):	9.6	**Median f_{eq} for Screen Procedure:**	0.53	
Estimated Displacement (in):	3.8	**Seismic Coefficient for Screen Procedure:**	0.27	*

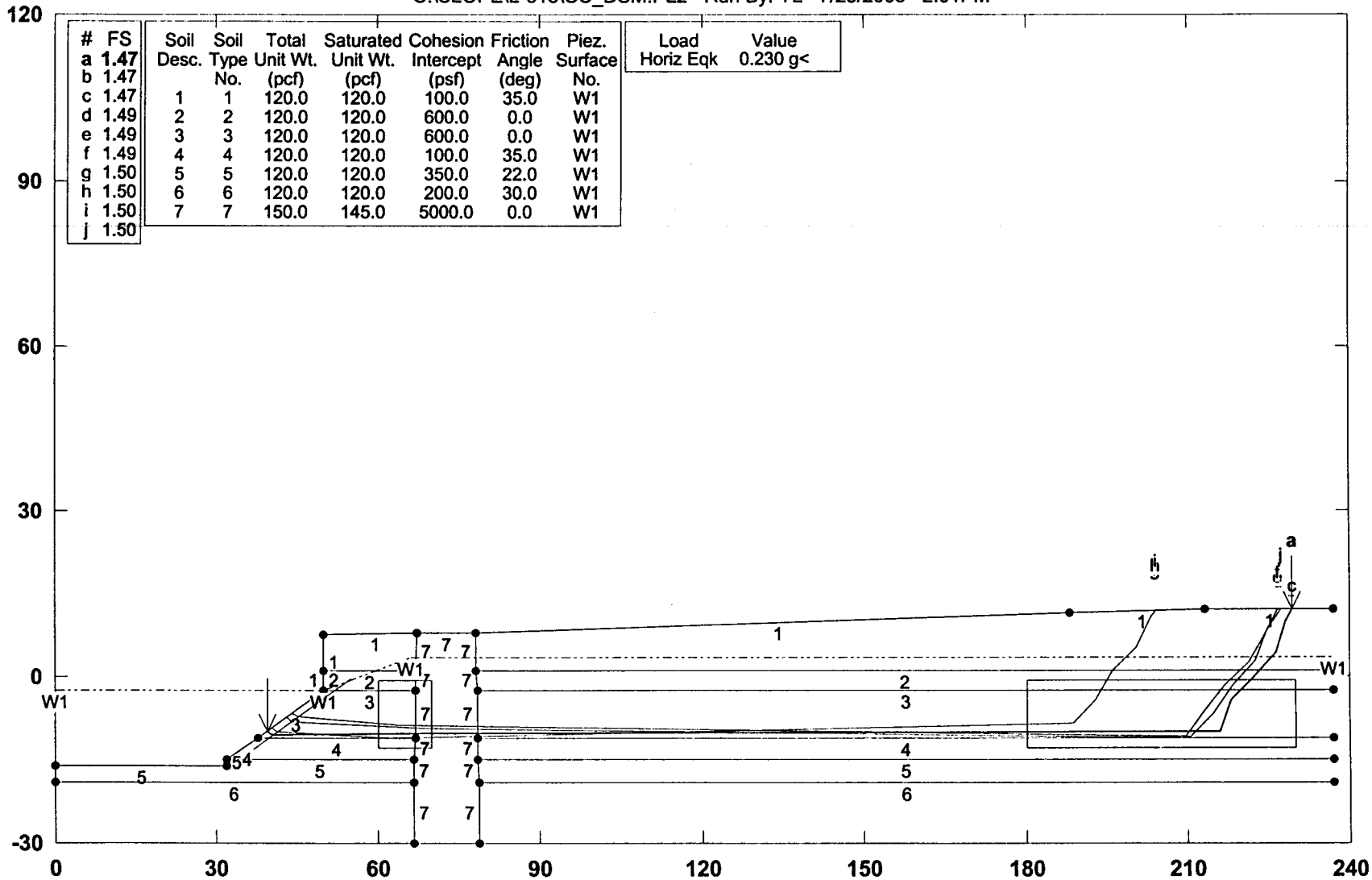
L-618 Neptune Marina Apts Lateral Spreading: Deep Soil Mixing Wall

C:\SLOPE\L-618\CC_DSM.PL2 Run By: YL 7/25/2005 2:01PM

#	FS
a	1.47
b	1.47
c	1.47
d	1.49
e	1.49
f	1.49
g	1.50
h	1.50
i	1.50
j	1.50

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1	1	120.0	120.0	100.0	35.0	W1
2	2	120.0	120.0	600.0	0.0	W1
3	3	120.0	120.0	600.0	0.0	W1
4	4	120.0	120.0	100.0	35.0	W1
5	5	120.0	120.0	350.0	22.0	W1
6	6	120.0	120.0	200.0	30.0	W1
7	7	150.0	145.0	5000.0	0.0	W1

Load	Value
Horiz Eqk	0.230 g<



PCSTABL5M/si FSmin=1.47

Safety Factors Are Calculated By The Modified Janbu Method

GROUP DELTA CONSULTANTS

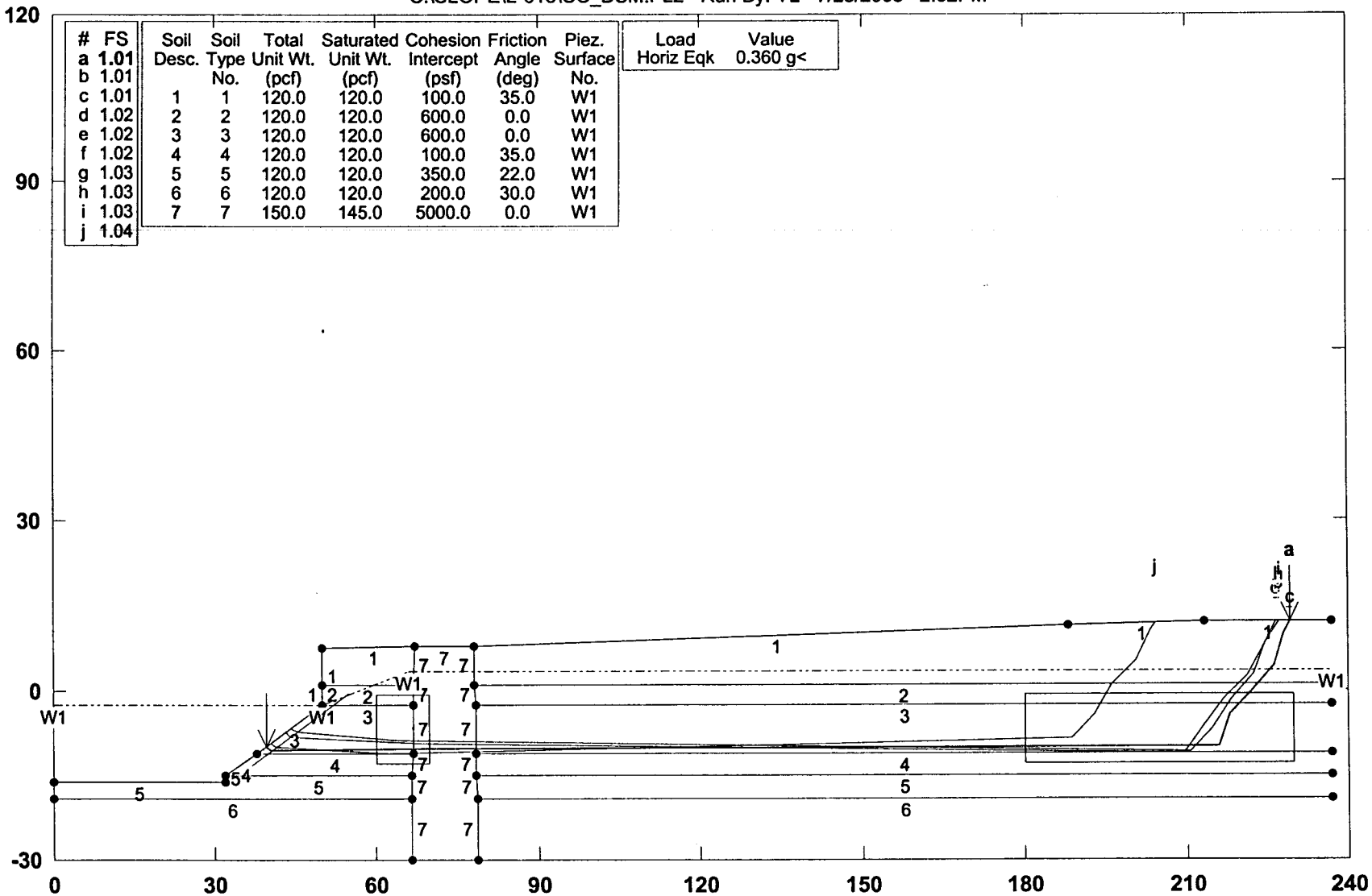
L-618 Neptune Marina Apts Lateral Spreading: Deep Soil Mixing Wall

C:\SLOPE\L-618\CC_DSM.PL2 Run By: YL 7/25/2005 2:02PM

#	FS
a	1.01
b	1.01
c	1.01
d	1.02
e	1.02
f	1.02
g	1.03
h	1.03
i	1.03
j	1.04

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1	1	120.0	120.0	100.0	35.0	W1
2	2	120.0	120.0	600.0	0.0	W1
3	3	120.0	120.0	600.0	0.0	W1
4	4	120.0	120.0	100.0	35.0	W1
5	5	120.0	120.0	350.0	22.0	W1
6	6	120.0	120.0	200.0	30.0	W1
7	7	150.0	145.0	5000.0	0.0	W1

Load	Value
Horiz Eqk	0.360 g<



PCSTABL5M/si FSmin=1.01

Safety Factors Are Calculated By The Modified Janbu Method

GROUP DELTA CONSULTANTS

TABLE 1

ESTIMATION OF PERMANENT SEISMIC DISPLACEMENT USING NEWMARK RIGID-SLIDING-BLOCK METHOD SIMPLIFIED PROCEDURE (BRAY AND RATHJE, 1998)

PROJECT NAME: Lateral Spreading Analysis for Neptune Marina Apts: 11' Deep Soil Mixing
PROJECT NO.: L-618
PROJECT SITE: Parcel 10R, Marquesas Way and Via Marina

CALCULATED BY: Ying Liu
DATE: 25-Jul-05

INPUT PARAMETERS:

Yield Acceleration, ky (g):	0.36		Normalized MHEA Sigma:	0	
Vertical Thickness, h (m):	6		Mean Period Sigma:	0	
Shear Wave Vel., Vs (m/s):	189	*	Significant Duration Sigma:	0	
Earthquake Magnitude, M:	7.10	*	Normalized Displacement Sigma:	0	
Earthquake Accel., Rock (g):	0.5	**			
Earthquake Distance, r (km):	7		Allowable screen displacement (cm):	5	*

CALCULATIONS:

Site Period (s):	0.127
NRF Factor:	0.921
Mean Period (s):	0.518
Duration, D05-95 (s):	15.226
Ts/Tm:	0.2453
MHEA/MHA*NRF:	1.000
MHEA, kmax:	0.4607
ky/kmax:	0.7814
Normalized Disp. (cm/sec):	0.1422

* Provided or required by LADWP
** Adjusted MHAr for a seismic coefficient of 0.3 that is required by LADWP

Estimated Displacement (cm):	1.0	**Median f_{eq} for Screen Procedure:**	0.53
Estimated Displacement (in):	0.4	**Seismic Coefficient for Screen Procedure:**	0.27 *

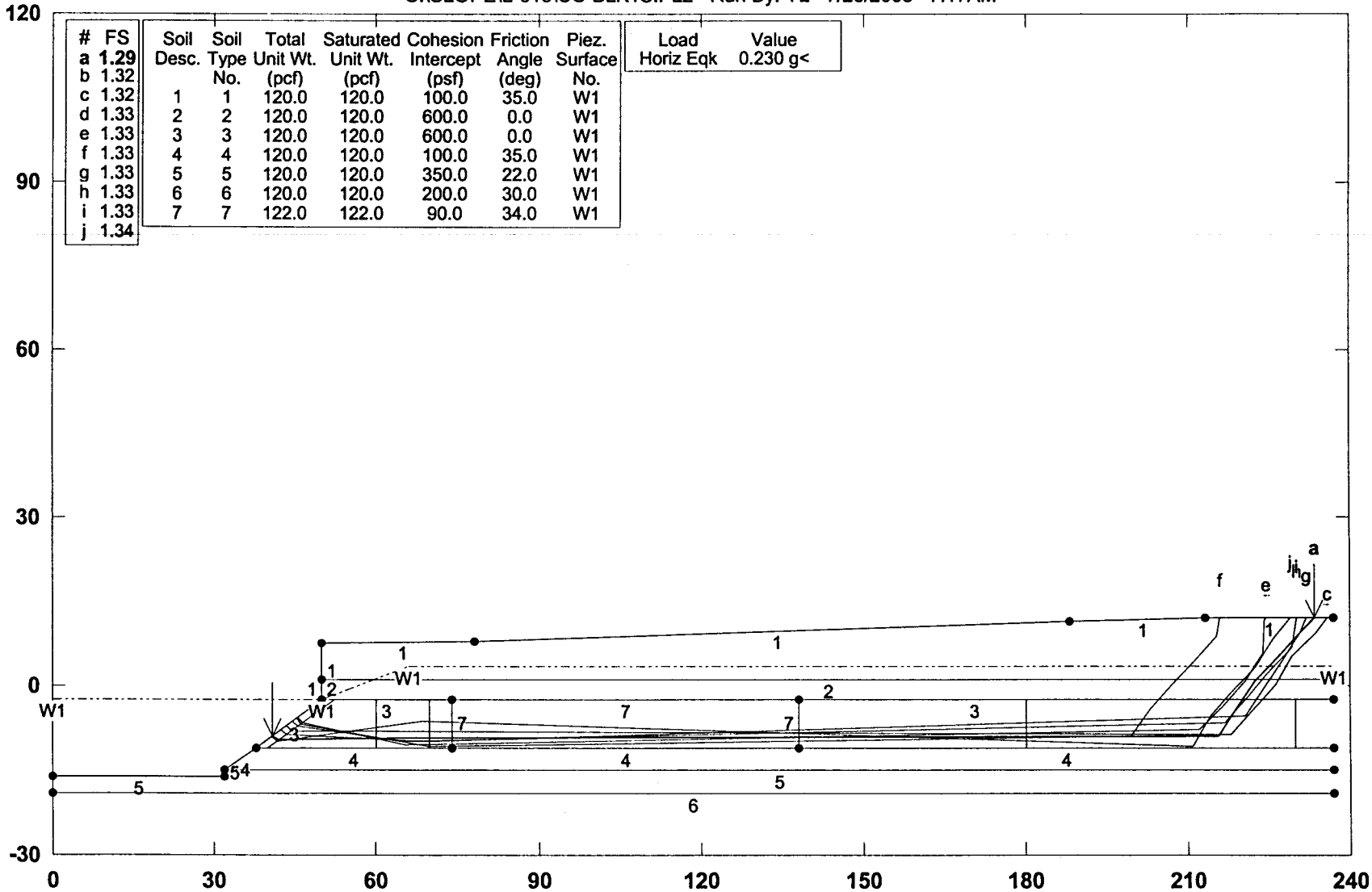
L-618 Neptune Marina Apts Lateral Spreading: 8 Rows Stone Columns

C:\SLOPE\L-618\CC-BLK1S.PL2 Run By: YL 7/26/2005 7:17AM

#	FS
a	1.29
b	1.32
c	1.32
d	1.33
e	1.33
f	1.33
g	1.33
h	1.33
i	1.33
j	1.34

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1	1	120.0	120.0	100.0	35.0	W1
2	2	120.0	120.0	600.0	0.0	W1
3	3	120.0	120.0	600.0	0.0	W1
4	4	120.0	120.0	100.0	35.0	W1
5	5	120.0	120.0	350.0	22.0	W1
6	6	120.0	120.0	200.0	30.0	W1
7	7	122.0	122.0	90.0	34.0	W1

Load	Value
Horiz Eqk	0.230 g<



PCSTABL5M/si FSmin=1.29

Safety Factors Are Calculated By The Modified Janbu Method

GROUP DELTA CONSULTANTS

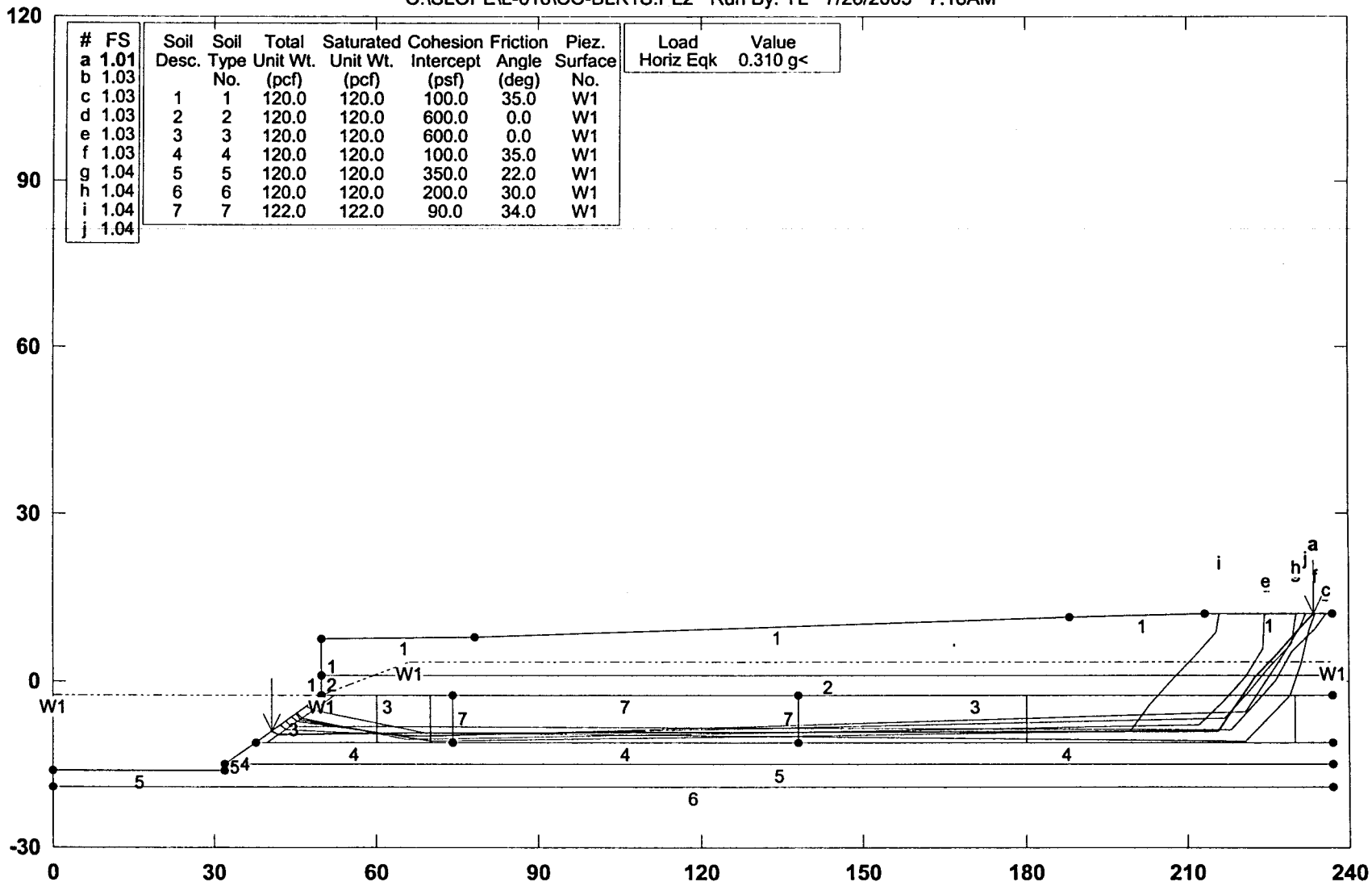
L-618 Neptune Marina Apts Lateral Spreading: 8 Rows Stone Columns

C:\SLOPE\L-618\CC-BLK1S.PL2 Run By: YL 7/26/2005 7:18AM

#	FS
a	1.01
b	1.03
c	1.03
d	1.03
e	1.03
f	1.03
g	1.04
h	1.04
i	1.04
j	1.04

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1	1	120.0	120.0	100.0	35.0	W1
2	2	120.0	120.0	600.0	0.0	W1
3	3	120.0	120.0	600.0	0.0	W1
4	4	120.0	120.0	100.0	35.0	W1
5	5	120.0	120.0	350.0	22.0	W1
6	6	120.0	120.0	200.0	30.0	W1
7	7	122.0	122.0	90.0	34.0	W1

Load	Value
Horiz Eqk	0.310 g<



PCSTABL5M/si FSmin=1.01

Safety Factors Are Calculated By The Modified Janbu Method

GROUP DELTA CONSULTANTS

TABLE 1

ESTIMATION OF PERMANENT SEISMIC DISPLACEMENT USING NEWMARK RIGID-SLIDING-BLOCK METHOD SIMPLIFIED PROCEDURE (BRAY AND RATHJE, 1998)

PROJECT NAME: Lateral Spreading Analysis for Neptune Marina Apts: 8 Rows Stone Columns
PROJECT NO.: L-618
PROJECT SITE: Parcel 10R, Marquesas Way and Via Marina

CALCULATED BY: Ying Liu
DATE: 26-Jul-05

INPUT PARAMETERS:

Yield Acceleration, ky (g):	0.31		Normalized MHEA Sigma:	0	
Vertical Thickness, h (m):	6		Mean Period Sigma:	0	
Shear Wave Vel., Vs (m/s):	189	*	Significant Duration Sigma:	0	
Earthquake Magnitude, M:	7.10	*	Normalized Displacement Sigma:	0	
Earthquake Accel., Rock (g):	0.5	**			
Earthquake Distance, r (km):	7		Allowable screen displacement (cm):	5	*

CALCULATIONS:

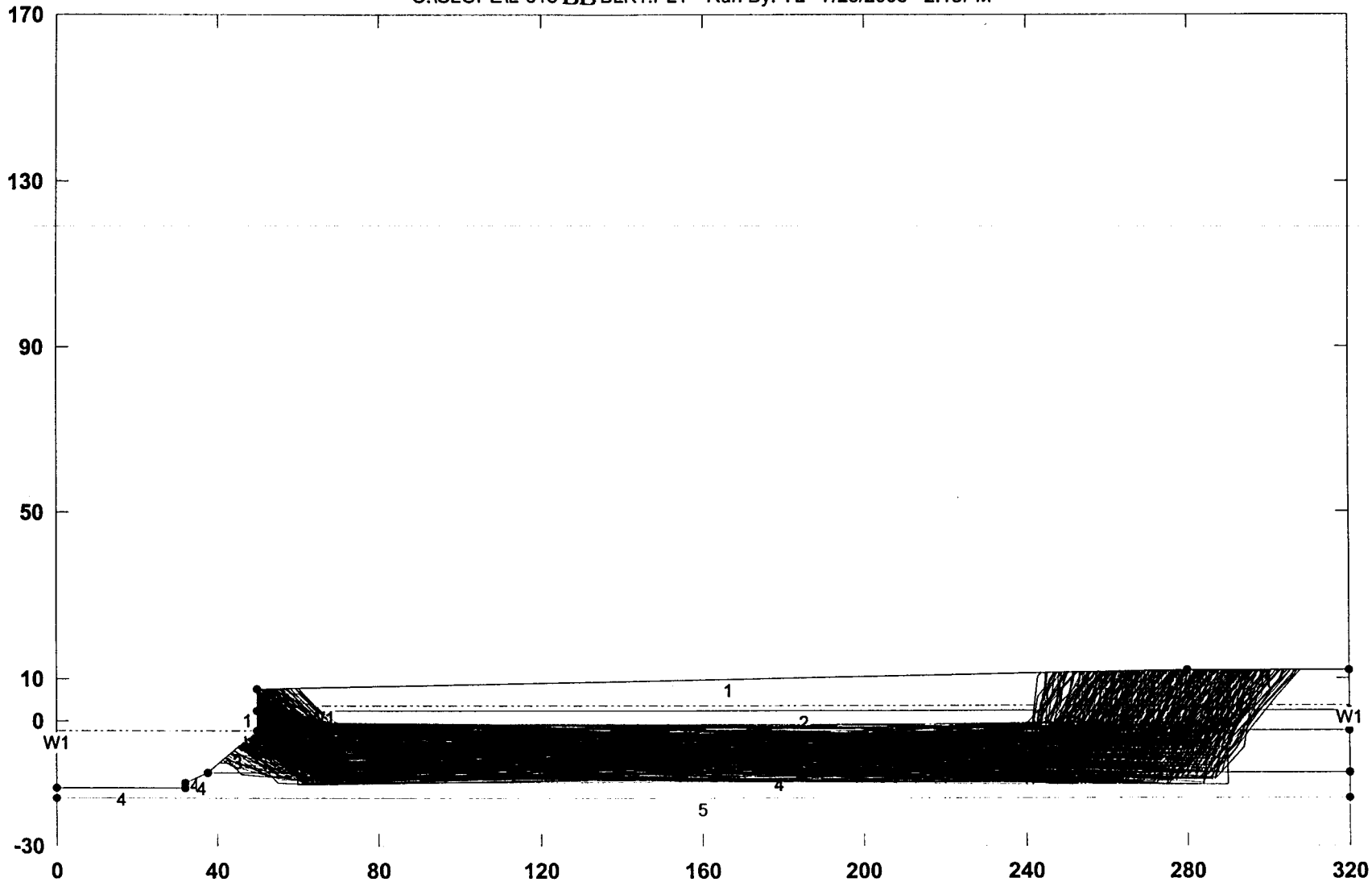
Site Period (s):	0.127
NRF Factor:	0.921
Mean Period (s):	0.518
Duration, D05-95 (s):	15.226
Ts/Tm:	0.2453
MHEA/MHA*NRF:	1.000
MHEA, kmax:	0.4607
ky/kmax:	0.6729
Normalized Disp. (cm/sec):	0.3391

* Provided or required by LADWP
** Adjusted MHAr for a seismic coefficient of 0.3 that is required by LADWP

Estimated Displacement (cm):	2.4	**Median f_{eq} for Screen Procedure:**	0.53	
Estimated Displacement (in):	0.9	**Seismic Coefficient for Screen Procedure:**	0.27	*

L-618 Neptune Marina Apts Lateral Spreading: Before Improvement

C:\SLOPE\L-618\BB BLK1.PLT Run By: YL 7/25/2005 2:13PM



GROUP DELTA CONSULTANTS

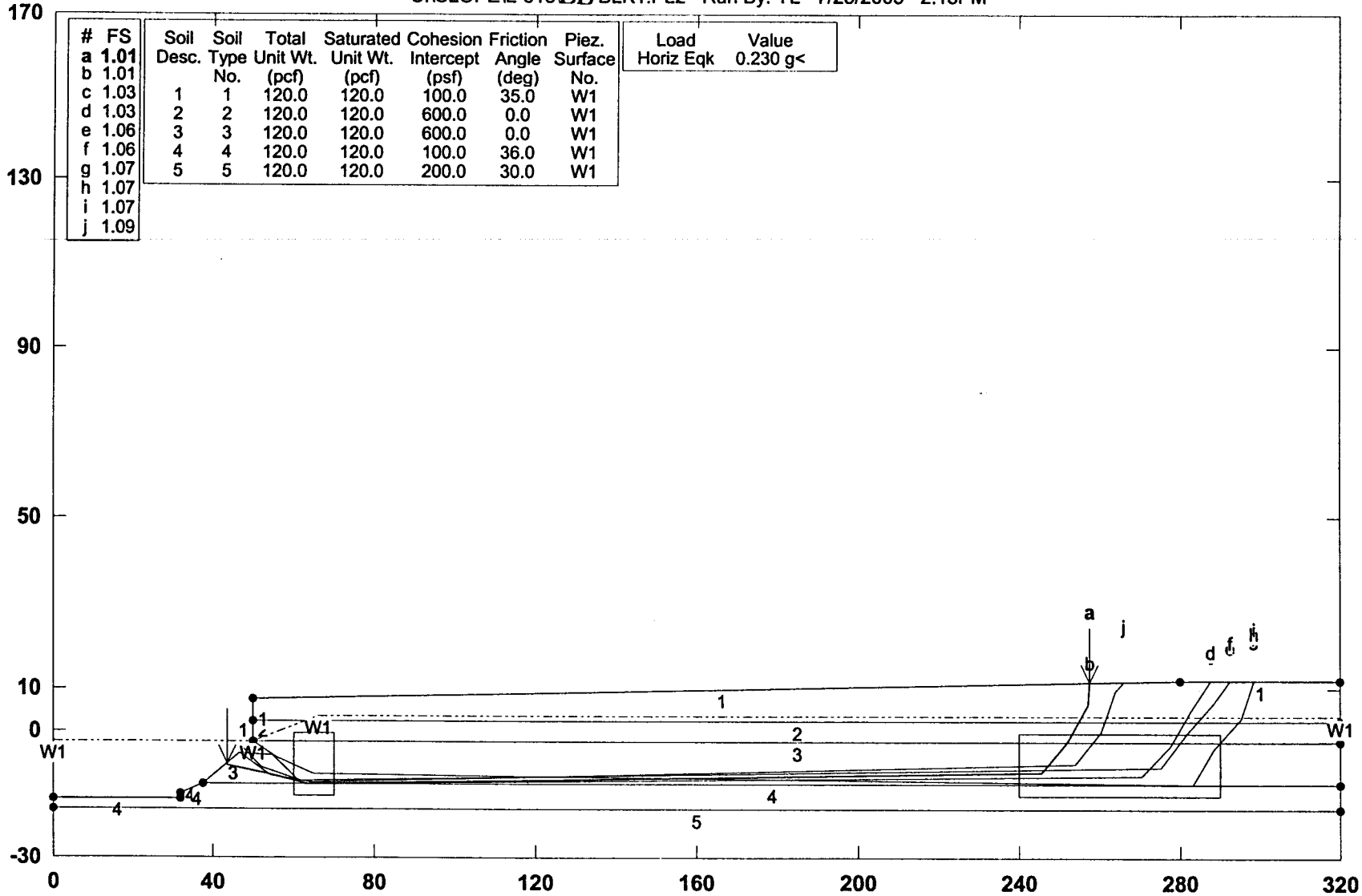
L-618 Neptune Marina Apts Lateral Spreading: Before Improvement

C:\SLOPE\L-618\BB-BLK1.PL2 Run By: YL 7/25/2005 2:13PM

#	FS
a	1.01
b	1.01
c	1.03
d	1.03
e	1.06
f	1.06
g	1.07
h	1.07
i	1.07
j	1.09

	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1		1	120.0	120.0	100.0	35.0	W1
2		2	120.0	120.0	600.0	0.0	W1
3		3	120.0	120.0	600.0	0.0	W1
4		4	120.0	120.0	100.0	36.0	W1
5		5	120.0	120.0	200.0	30.0	W1

Load	Value
Horiz Eqk	0.230 g<



PCSTABL5M/si FSmin=1.01

Safety Factors Are Calculated By The Modified Janbu Method

GROUP DELTA CONSULTANTS

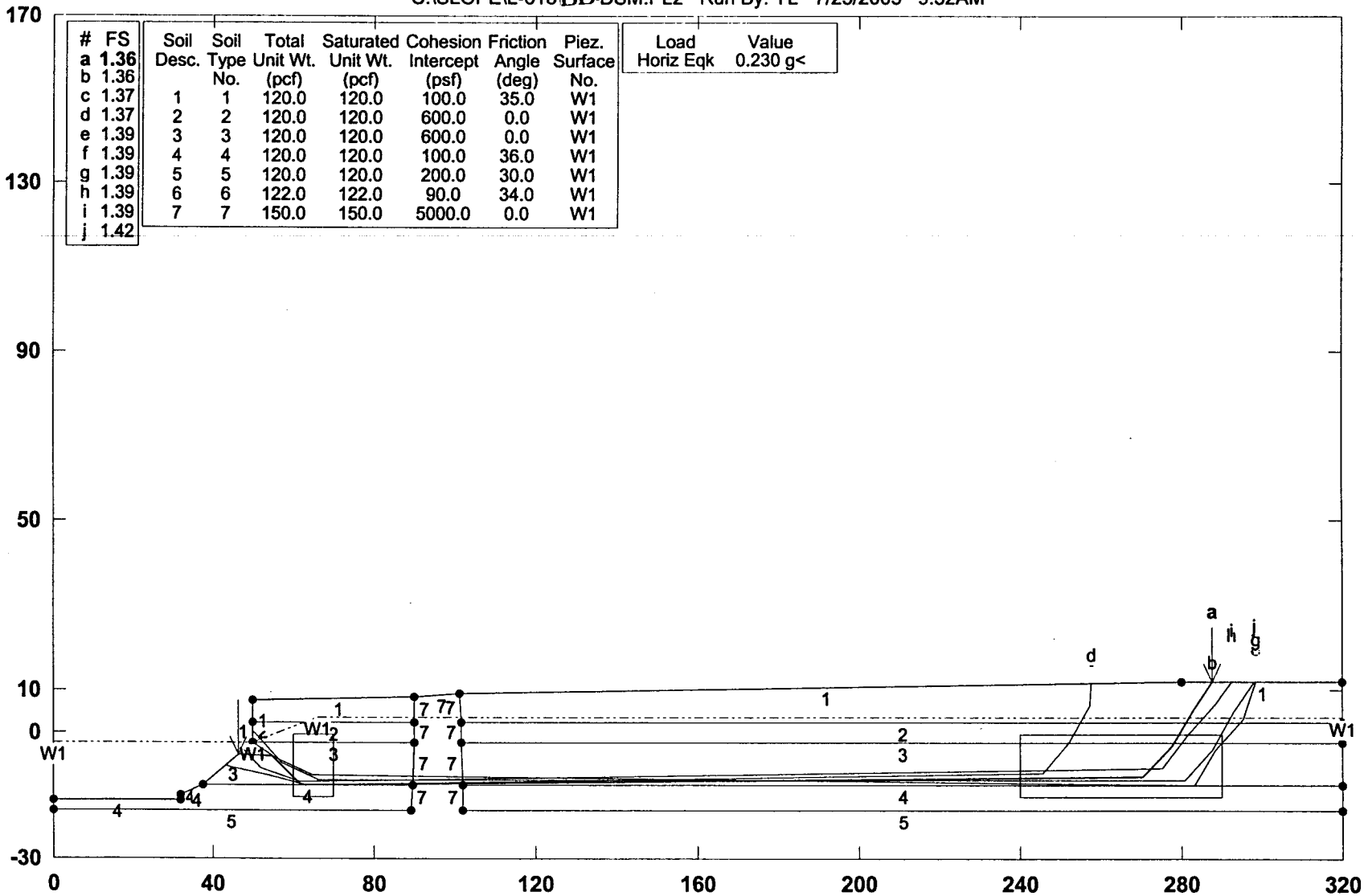
L-618 Neptune Marina Apts Lateral Spreading: Deep Soil Mixed Wall

C:\SLOPE\L-618\BB-DSM.PL2 Run By: YL 7/25/2005 9:32AM

#	FS
a	1.36
b	1.36
c	1.37
d	1.37
e	1.39
f	1.39
g	1.39
h	1.39
i	1.39
j	1.42

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1	1	120.0	120.0	100.0	35.0	W1
2	2	120.0	120.0	600.0	0.0	W1
3	3	120.0	120.0	600.0	0.0	W1
4	4	120.0	120.0	100.0	36.0	W1
5	5	120.0	120.0	200.0	30.0	W1
6	6	122.0	122.0	90.0	34.0	W1
7	7	150.0	150.0	5000.0	0.0	W1

Load	Value
Horiz Eqk	0.230 g<



PCSTABL5M/si FSmin=1.36

Safety Factors Are Calculated By The Modified Janbu Method

GROUP DELTA CONSULTANTS

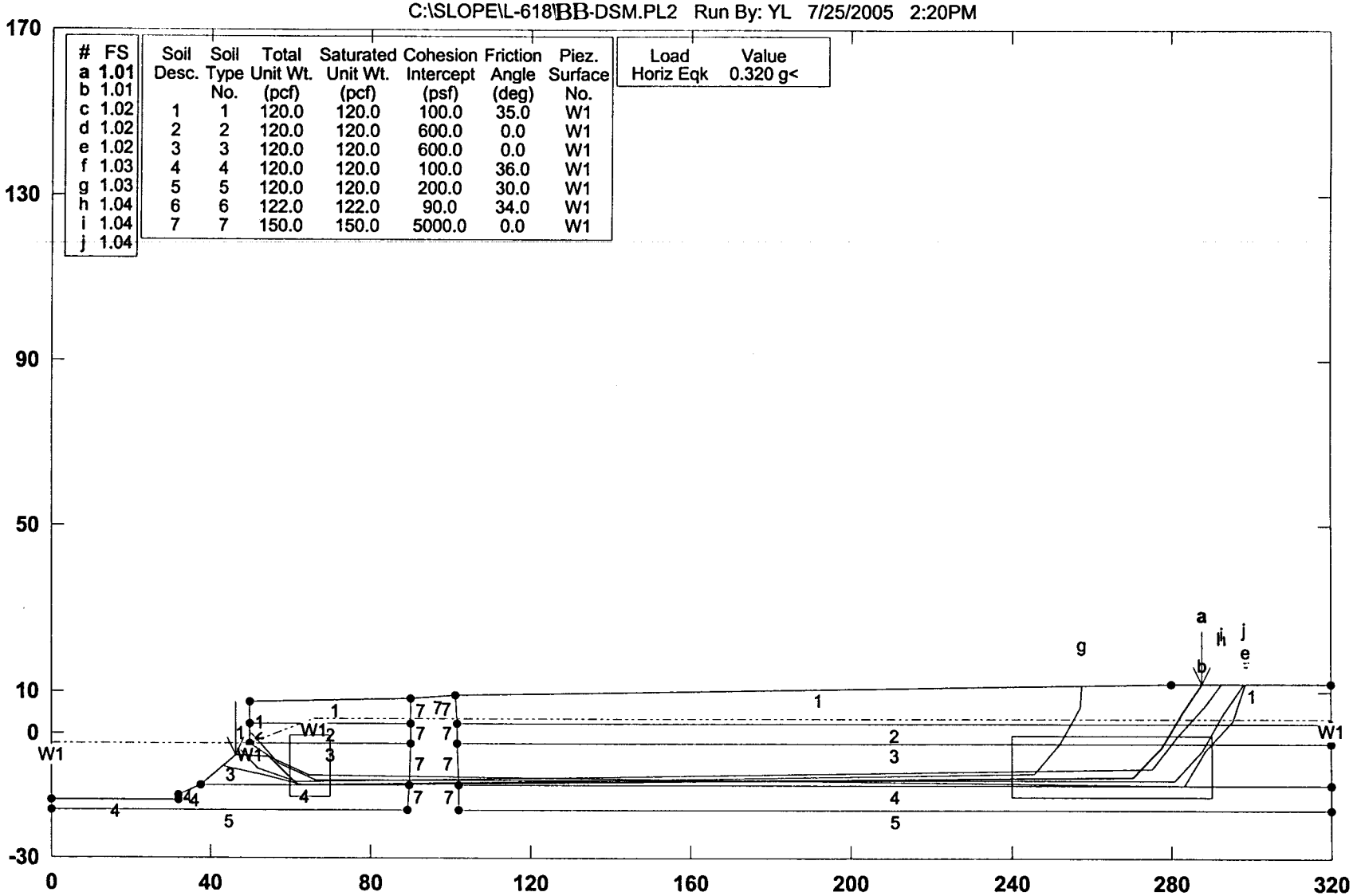
L-618 Neptune Marina Apts Lateral Spreading: Deep Soil Mixed Wall

C:\SLOPE\L-618\BB-DSM.PL2 Run By: YL 7/25/2005 2:20PM

#	FS
a	1.01
b	1.01
c	1.02
d	1.02
e	1.02
f	1.03
g	1.03
h	1.04
i	1.04
j	1.04

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1	1	120.0	120.0	100.0	35.0	W1
2	2	120.0	120.0	600.0	0.0	W1
3	3	120.0	120.0	600.0	0.0	W1
4	4	120.0	120.0	100.0	36.0	W1
5	5	120.0	120.0	200.0	30.0	W1
6	6	122.0	122.0	90.0	34.0	W1
7	7	150.0	150.0	5000.0	0.0	W1

Load	Value
Horiz Eqk	0.320 g<



PCSTABL5M/si FSmin=1.01

Safety Factors Are Calculated By The Modified Janbu Method

GROUP DELTA CONSULTANTS

TABLE 1

ESTIMATION OF PERMANENT SEISMIC DISPLACEMENT USING NEWMARK RIGID-SLIDING-BLOCK METHOD SIMPLIFIED PROCEDURE (BRAY AND RATHJE, 1998)

PROJECT NAME: Lateral Spreading Analysis for Neptune Marina Apts: 11' Deep Soil Mixed Wall
PROJECT NO.: L-618
PROJECT SITE: Parcel 10R, Marquesas Way and Via Marina

CALCULATED BY: Ying Liu
DATE: 25-Jul-05

INPUT PARAMETERS:

Yield Acceleration, ky (g):	0.32		Normalized MHEA Sigma:	0	
Vertical Thickness, h (m):	6.8		Mean Period Sigma:	0	
Shear Wave Vel., Vs (m/s):	189	*	Significant Duration Sigma:	0	
Earthquake Magnitude, M:	7.10	*	Normalized Displacement Sigma:	0	
Earthquake Accel., Rock (g):	0.5	**			
Earthquake Distance, r (km):	7		Allowable screen displacement (cm):	5	*

CALCULATIONS:

Site Period (s):	0.144
NRF Factor:	0.921
Mean Period (s):	0.518
Duration, D05-95 (s):	15.226
Ts/Tm:	0.2780
MHEA/MHA*NRF:	1.000
MHEA, kmax:	0.4607
ky/kmax:	0.6946
Normalized Disp. (cm/sec):	0.2850

* Provided or required by LADWP
** Adjusted MHAr for a seismic coefficient of 0.3 that is required by LADWP

Estimated Displacement (cm):	2.0	**Median f_{eq} for Screen Procedure:**	0.53
Estimated Displacement (in):	0.8	**Seismic Coefficient for Screen Procedure:**	0.27 *

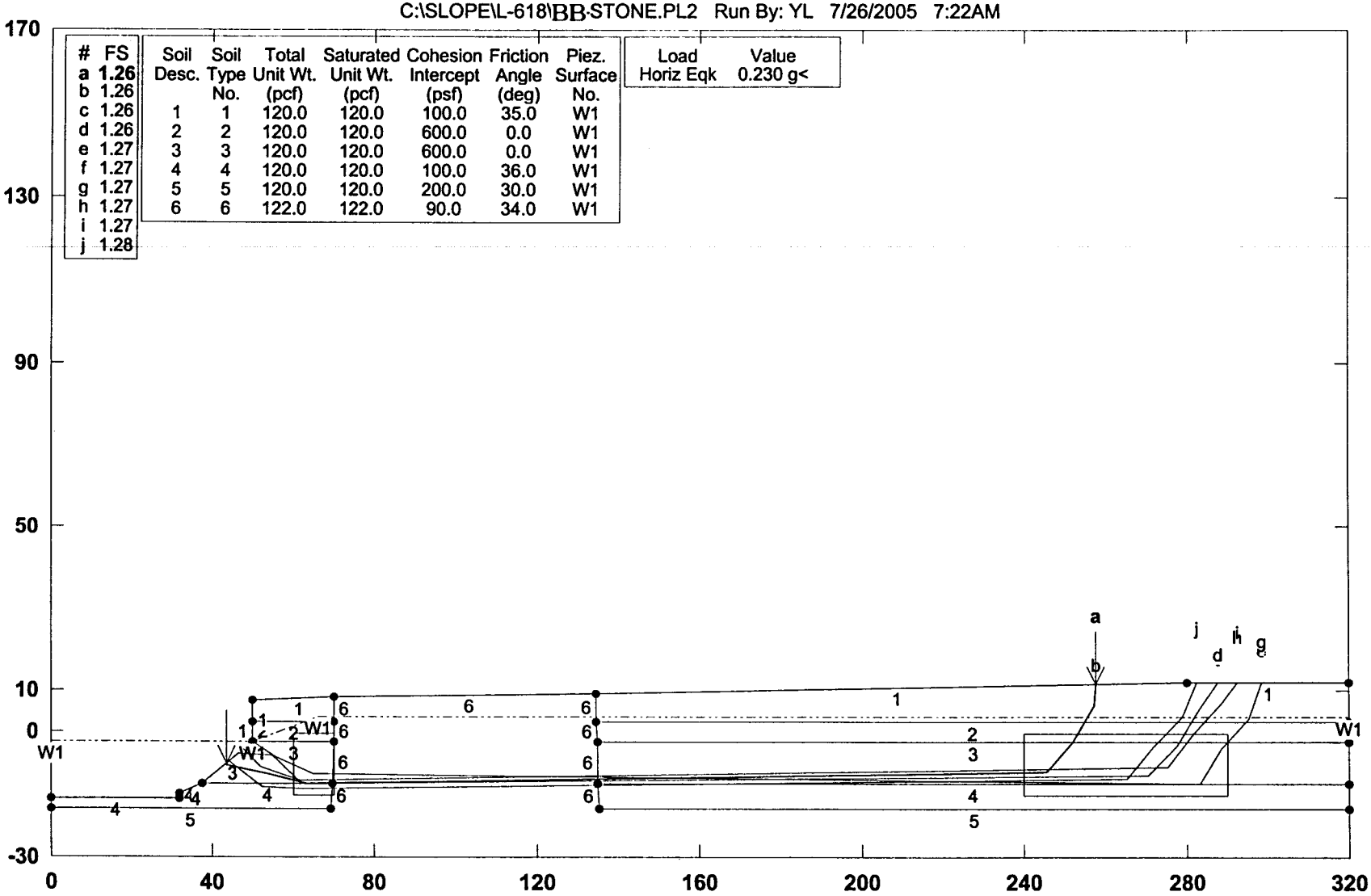
L-618 Neptune Marina Apts Lateral Spreading: 8 Rows Stone Columns

C:\SLOPE\L-618\BB-STONE.PL2 Run By: YL 7/26/2005 7:22AM

#	FS
a	1.26
b	1.26
c	1.26
d	1.26
e	1.27
f	1.27
g	1.27
h	1.27
i	1.27
j	1.28

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1	1	120.0	120.0	100.0	35.0	W1
2	2	120.0	120.0	600.0	0.0	W1
3	3	120.0	120.0	600.0	0.0	W1
4	4	120.0	120.0	100.0	36.0	W1
5	5	120.0	120.0	200.0	30.0	W1
6	6	122.0	122.0	90.0	34.0	W1

Load	Value
Horiz Eqk	0.230 g<



PCSTABL5M/si FSmin=1.26

Safety Factors Are Calculated By The Modified Janbu Method

GROUP DELTA CONSULTANTS

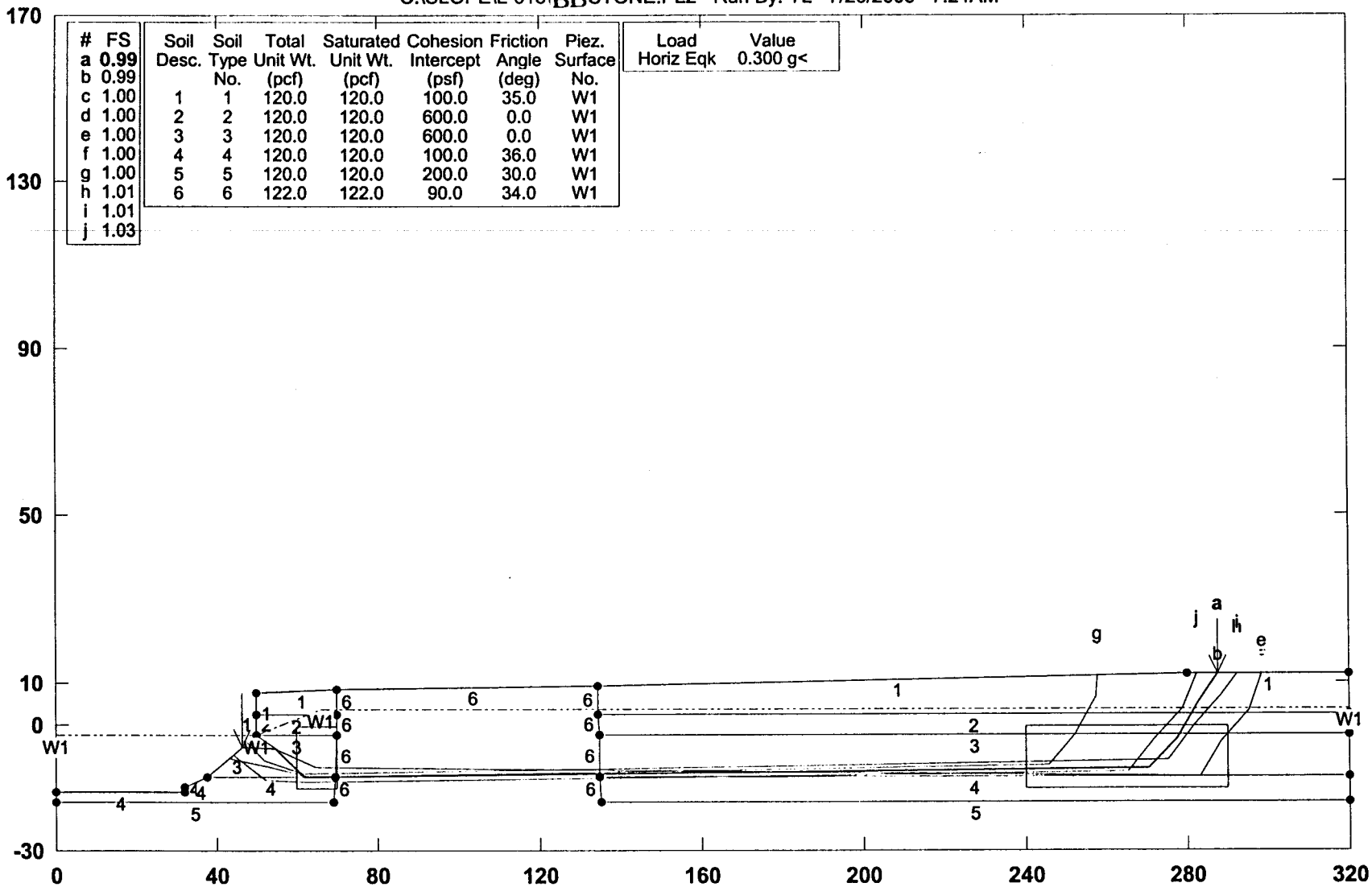
L-618 Neptune Marina Apts Lateral Spreading: 8 Rows Stone Columns

C:\SLOPE\L-618\BBSTONE.PL2 Run By: YL 7/26/2005 7:24AM

#	FS
a	0.99
b	0.99
c	1.00
d	1.00
e	1.00
f	1.00
g	1.00
h	1.01
i	1.01
j	1.03

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1	1	120.0	120.0	100.0	35.0	W1
2	2	120.0	120.0	600.0	0.0	W1
3	3	120.0	120.0	600.0	0.0	W1
4	4	120.0	120.0	100.0	36.0	W1
5	5	120.0	120.0	200.0	30.0	W1
6	6	122.0	122.0	90.0	34.0	W1

Load	Value
Horiz Eqk	0.300 g<



PCSTABL5M/si FSmin=0.99

Safety Factors Are Calculated By The Modified Janbu Method

GROUP DELTA CONSULTANTS

TABLE 1

ESTIMATION OF PERMANENT SEISMIC DISPLACEMENT USING NEWMARK RIGID-SLIDING-BLOCK METHOD SIMPLIFIED PROCEDURE (BRAY AND RATHJE, 1998)

PROJECT NAME: Lateral Spreading Analysis for Neptune Marina Apts: 8 Rows Stone Columns
PROJECT NO.: L-618
PROJECT SITE: Parcel 10R, Marquesas Way and Via Marina

CALCULATED BY: Ying Liu
DATE: 26-Jul-05

INPUT PARAMETERS:

Yield Acceleration, ky (g):	0.3		Normalized MHEA Sigma:	0	
Vertical Thickness, h (m):	6.8		Mean Period Sigma:	0	
Shear Wave Vel., Vs (m/s):	189	*	Significant Duration Sigma:	0	
Earthquake Magnitude, M:	7.10	*	Normalized Displacement Sigma:	0	
Earthquake Accel., Rock (g):	0.5	**			
Earthquake Distance, r (km):	7		Allowable screen displacement (cm):	5	*

CALCULATIONS:

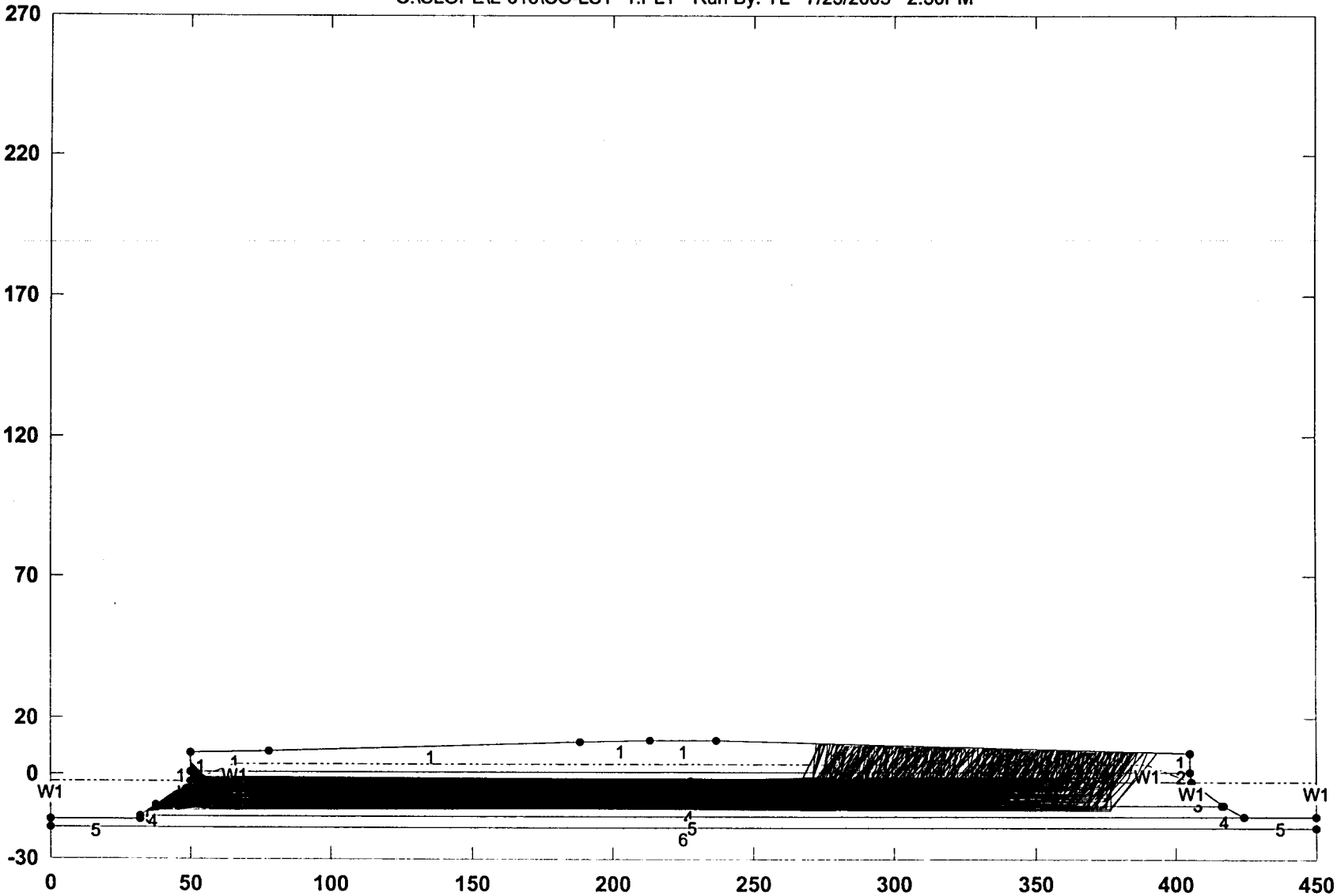
Site Period (s):	0.144
NRF Factor:	0.921
Mean Period (s):	0.518
Duration, D05-95 (s):	15.226
Ts/Tm:	0.2780
MHEA/MHA*NRF:	1.000
MHEA, kmax:	0.4607
ky/kmax:	0.6512
Normalized Disp. (cm/sec):	0.4034

* Provided or required by LADWP
** Adjusted MHAr for a seismic coefficient of 0.3 that is required by LADWP

Estimated Displacement (cm):	2.8	**Median f_{eq} for Screen Procedure:**	0.53	
Estimated Displacement (in):	1.1	**Seismic Coefficient for Screen Procedure:**	0.27	*

L-618 Neptune Marina Apts Lateral Spreading: 250' from seawall

C:\SLOPE\L-618\CC-LST~1.PLT Run By: YL 7/25/2005 2:30PM



GROUP DELTA CONSULTANTS

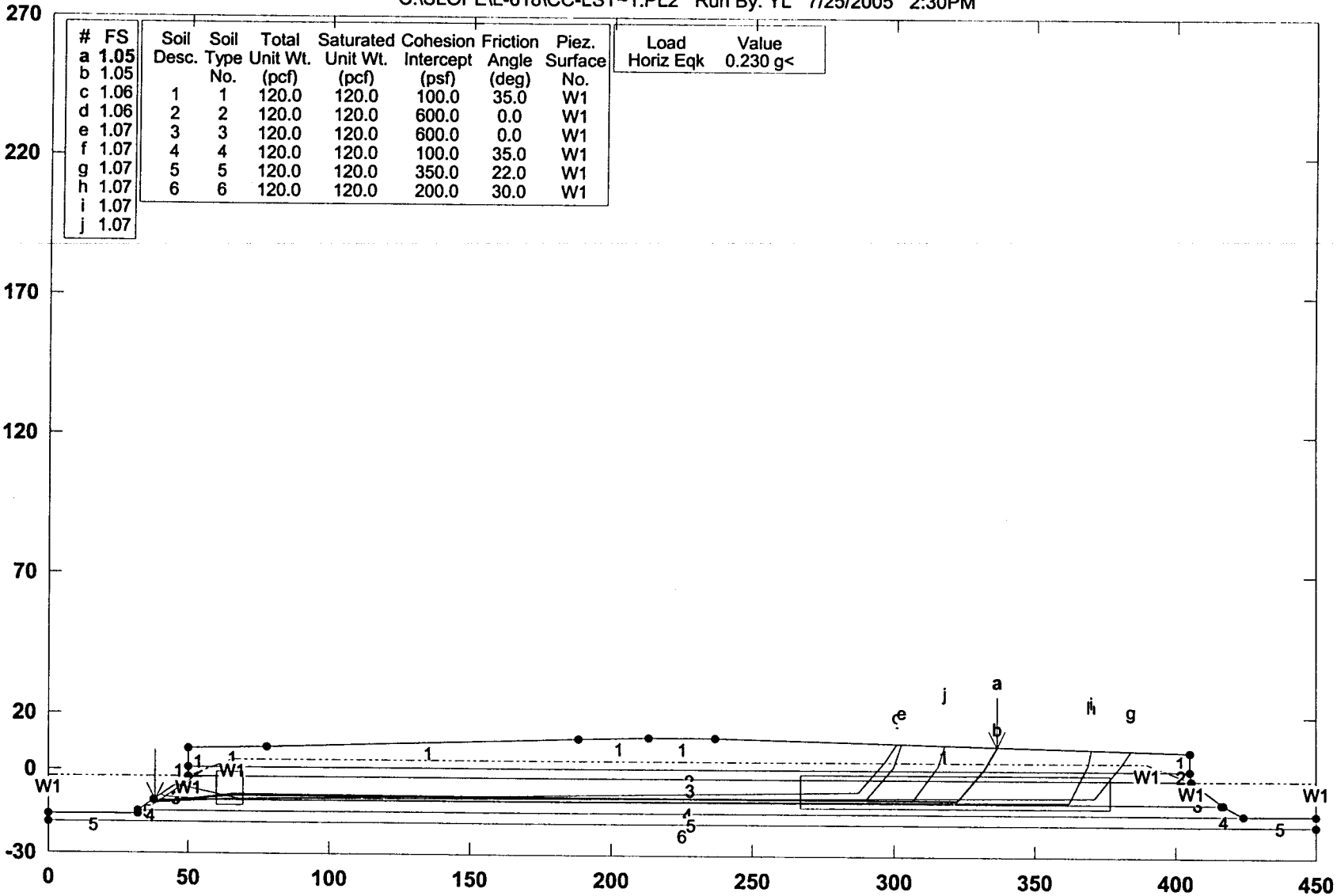
L-618 Neptune Marina Apts Lateral Spreading: 250' from seawall

C:\SLOPE\L-618\CC-LST~1.PL2 Run By: YL 7/25/2005 2:30PM

#	FS
a	1.05
b	1.05
c	1.06
d	1.06
e	1.07
f	1.07
g	1.07
h	1.07
i	1.07
j	1.07

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1	1	120.0	120.0	100.0	35.0	W1
2	2	120.0	120.0	600.0	0.0	W1
3	3	120.0	120.0	600.0	0.0	W1
4	4	120.0	120.0	100.0	35.0	W1
5	5	120.0	120.0	350.0	22.0	W1
6	6	120.0	120.0	200.0	30.0	W1

Load	Value
Horiz Eqk	0.230 g<



PCSTABL5M/si FSmin=1.05

Safety Factors Are Calculated By The Modified Janbu Method

GROUP DELTA CONSULTANTS

L-618 Lateral Spreading: 8 Rows Stone Columns + Pile Effect

C:\SLOPE\L-618\BB STONE.PL2 Run By: YL 7/26/2005 7:51AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1	1	120.0	120.0	100.0	35.0	W1
2	2	120.0	120.0	600.0	0.0	W1
3	3	120.0	120.0	675.0	0.0	W1
4	4	120.0	120.0	100.0	36.0	W1
5	5	120.0	120.0	200.0	30.0	W1
6	6	122.0	122.0	90.0	34.0	W1

Load	Value
Horiz Eqk	0.320 g<

$$A_r = \frac{3 \times \pi \frac{d^2}{4}}{30 \times 30}$$

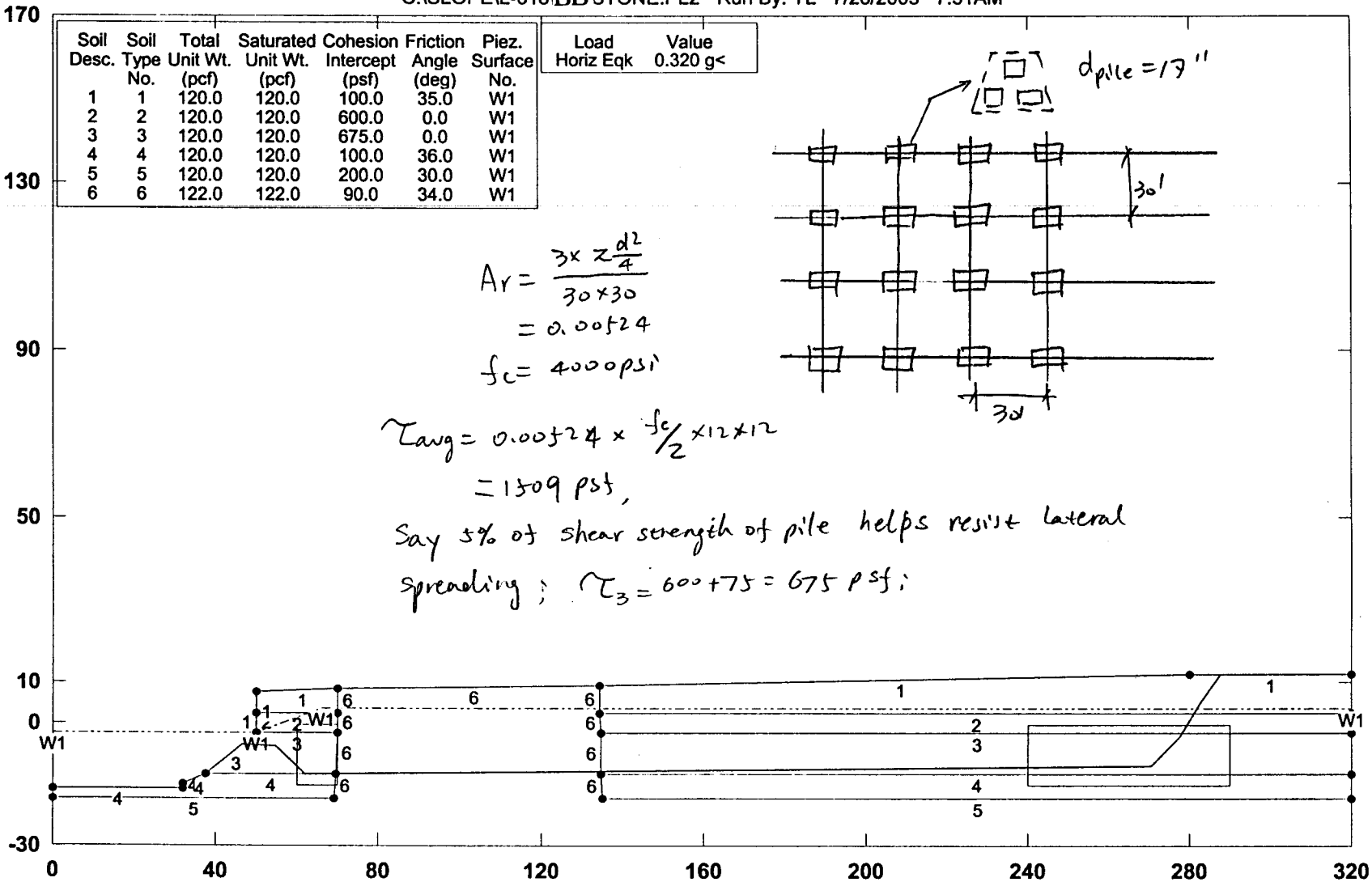
$$= 0.00524$$

$$f_c = 4000 psi$$

$$\tau_{avg} = 0.00524 \times f_c/2 \times 12 \times 12$$

$$= 1509 psf,$$

Say 5% of shear strength of pile helps resist lateral spreading; $\tau_3 = 600 + 75 = 675$ psf;



PCSTABL5M/si FSmin=1.00

Safety Factors Are Calculated By The Modified Janbu Method

GROUP DELTA CONSULTANTS

TABLE 1

ESTIMATION OF PERMANENT SEISMIC DISPLACEMENT USING NEWMARK RIGID-SLIDING-BLOCK METHOD SIMPLIFIED PROCEDURE (BRAY AND RATHJE, 1998)

PROJECT NAME: Lateral Spreading Analysis for Neptune Marina Apts: 8 Rows Stone Columns + Pile Effect
PROJECT NO.: L-618
PROJECT SITE: Parcel 10R, Marquesas Way and Via Marina

CALCULATED BY: Ying Liu
DATE: 26-Jul-05

INPUT PARAMETERS:

Yield Acceleration, ky (g):	0.32		Normalized MHEA Sigma:	0	
Vertical Thickness, h (m):	6.8		Mean Period Sigma:	0	
Shear Wave Vel., Vs (m/s):	189	*	Significant Duration Sigma:	0	
Earthquake Magnitude, M:	7.10	*	Normalized Displacement Sigma:	0	
Earthquake Accel., Rock (g):	0.5	**			
Earthquake Distance, r (km):	7		Allowable screen displacement (cm):	5	*

CALCULATIONS:

Site Period (s):	0.144
NRF Factor:	0.921
Mean Period (s):	0.518
Duration, D05-95 (s):	15.226
Ts/Tm:	0.2780
MHEA/MHA*NRF:	1.000
MHEA, kmax:	0.4607
ky/kmax:	0.6946
Normalized Disp. (cm/sec):	0.2850

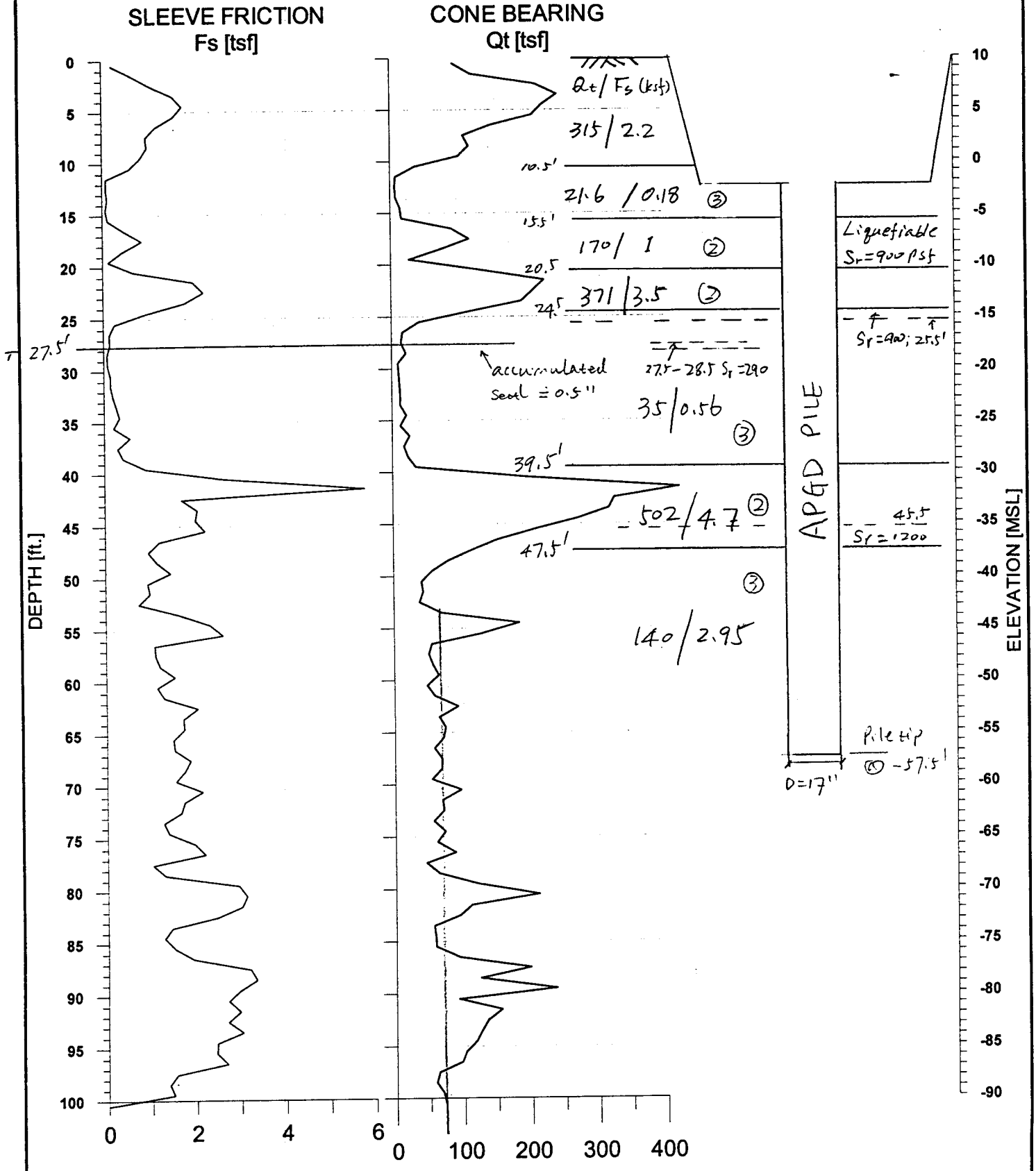
* Provided or required by LADWP
** Adjusted MHAr for a seismic coefficient of 0.3 that is required by LADWP

Estimated Displacement (cm):	2.0	**Median f_{eq} for Screen Procedure:**	0.53	
Estimated Displacement (in):	0.8	**Seismic Coefficient for Screen Procedure:**	0.27	*

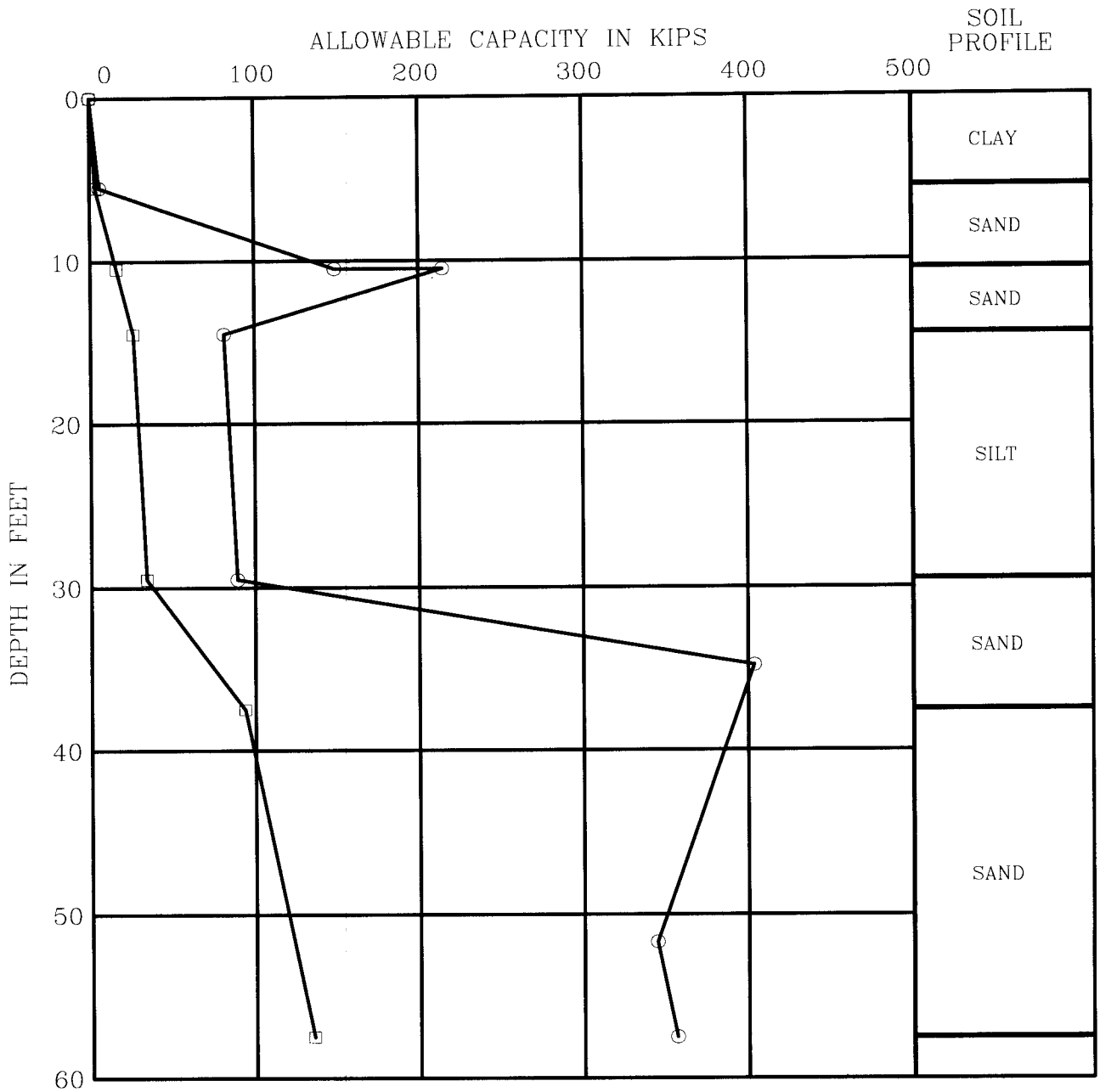
APPENDIX E

Pile Capacity Calculation

GROUP DELTA CONSULTANTS



GROUP DELTA CONSULTANTS	CONE PENETRATION TEST RESULTS		
	PROJECT: Neptune Marina	CPT No.: G-02	FIGURE:
	OWNER: Legacy Partners	TEST DATE: 06/09/05	
	PROJECT No.: L-618	TESTED BY: Kehoe	



LEGEND

- □ SKIN FRICTION
- ○ TOTAL PILE CAPACITY

PILE DIAMETER	:	1.42 ft.
PILE TYPE	:	DRIVEN,LD
FACTOR OF SAFETY		
END BEARING	:	1.00
SKIN FRICTION	:	1.00

1. Static Capacity : 355 kips
   Friction : 135 kips
   End : 220 kips
   Allowable : 135/2 + 220/3 = 141 kips

2. Liquefaction downdrag : 40 kips

3. F.S = $\frac{355-40}{140+40}$ = 1.75 for seismic downdrag

GP-02	Axial Bearing Capacity of APGD Pile
Group Delta Consultants, Inc	ALLOWABLE PILE CAPACITY

```
*********************************************
*                                           *
*        AXIAL PILE CAPACITY PROGRAM        *
*                                           *
**************  A X I A L / G  **************
*                                           *
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*                                           *
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*                                           *
*********************************************
```

"GEOSOFT "

"Axial Bearing Capacity of APGD Pile "

INPUT PILE DATA

```
NUMBER OF LAYERS =         6
PILE TYPE        = DRIVEN,LD
DIAMETER OF PILE =     1.420     FEET
END AREA         =     1.580     FT*FT
PERIMETER        =     4.460     FEET
FRICTION FS      =     1.000
END BEARING FS   =     1.000
ULT. SETTL.      =      .800     INCH, FOR DRILLED PILES (DEFAULT = 0.05 * DIAMETER)
```

INPUT SOIL DATA

DEPTH FT	SOIL TYPE	UNIT WEIGHT PCF	COHESION KSF	FRICTION ANGLE	BLOW COUNT	CONE RESISTANCE-KSF TIP	SKIN
.0	CLAY	57.6	.000	.0	.0	21.6	.2
5.5	CLAY	57.6	.000	.0	.0	21.6	.2
5.5	SAND	57.6	.000	.0	.0	170.0	1.0
10.5	SAND	57.6	.000	.0	.0	170.0	1.0
10.5	SAND	57.6	.000	.0	.0	170.0	1.0
14.5	SAND	57.6	.000	.0	.0	170.0	1.0
14.5	SILT	57.6	.000	.0	.0	35.0	.6
29.5	SILT	57.6	.000	.0	.0	35.0	.6
29.5	SAND	57.6	.000	.0	.0	502.0	4.7
37.5	SAND	57.6	.000	.0	.0	502.0	4.7
37.5	SAND	57.6	.000	.0	.0	140.0	3.0
57.5	SAND	57.6	.000	.0	.0	140.0	3.0

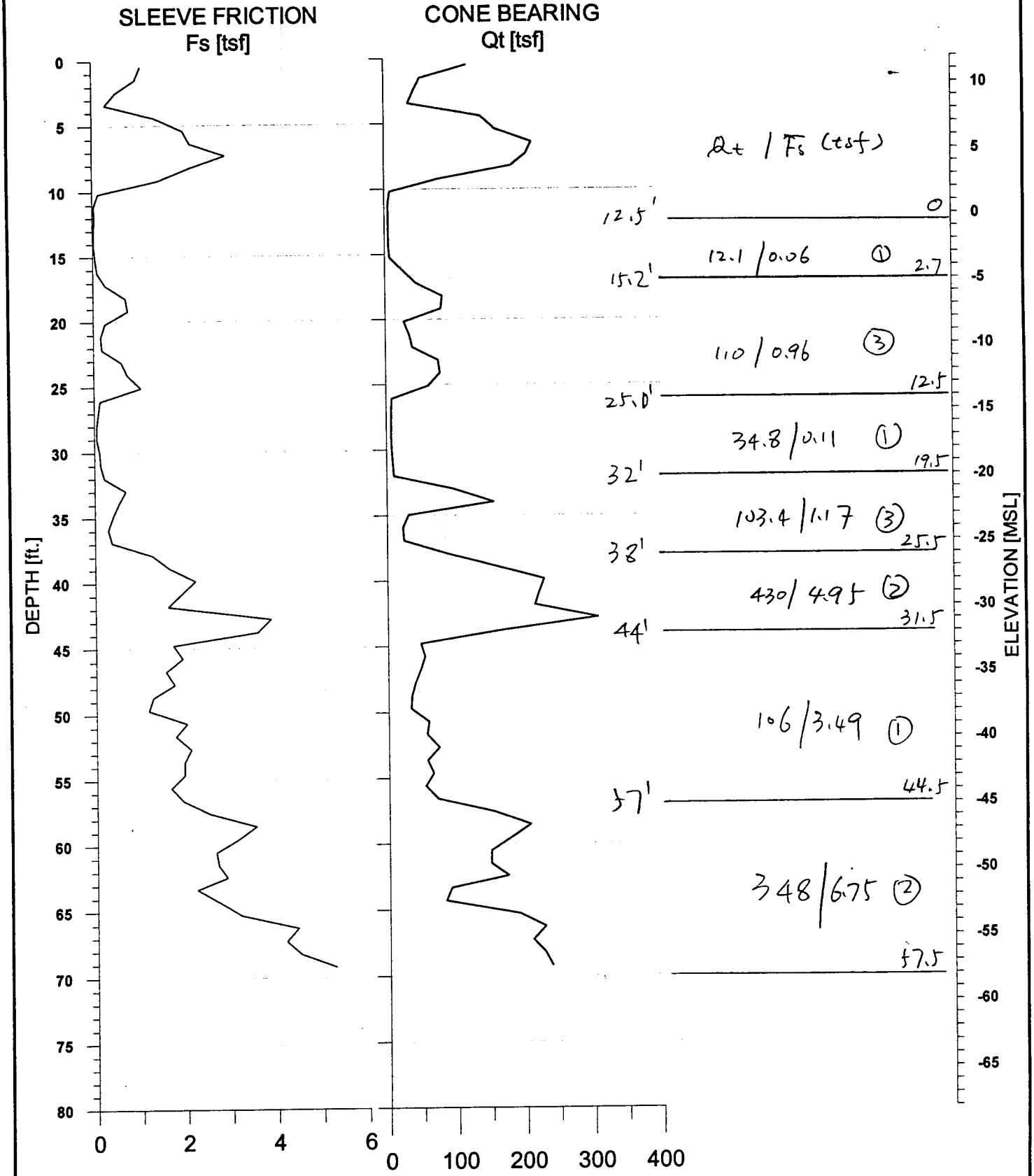
INTERIM PILE CAPACITY TABLE

DEPTH FEET	PO KSF	UNIT SF KSF	UNIT EB KSF	***ULTIMATE PILE CAPACITY, KIP*** FRICTION	END	TOTAL
.0	.000	.18	0.	0.	0.	0.
5.5	.317	.10	2.	3.	3.	6.
5.5	.317	.57	66.	3.	104.	107.
10.5	.605	.57	126.	16.	199.	215.
10.5	.605	.57	126.	16.	199.	215.
14.5	.835	.57	170.	26.	269.	295.
14.5	.835	.12	35.	26.	55.	81.
29.5	1.699	.12	35.	34.	55.	89.
29.5	1.699	1.67	502.	34.	793.	827.
37.5	2.160	1.67	502.	94.	793.	887.
37.5	2.160	.47	140.	94.	221.	315.
57.5	3.312	.47	140.	135.	221.	356.

FINAL PILE CAPACITY TABLE

DEPTH FEET	PO KSF	******* ALLOWABLE CAPACITY, KIP ******* FRICTION	END	TOTAL
.00	.00	0	0	0
1.00	.06	1	0	1
2.00	.12	1	1	2
3.00	.17	2	1	3
4.00	.23	2	2	4
5.50	.32	3	3	6
6.50	.37	6	29	35
7.50	.43	8	55	63
8.50	.49	11	81	92
9.50	.55	13	107	120
10.50	.60	16	199	215
11.50	.66	19	162	181
12.50	.72	21	127	148
13.50	.78	24	91	115
14.50	.84	26	55	81
15.50	.89	27	55	82
16.50	.95	27	55	82
17.50	1.01	28	55	83
18.50	1.07	28	56	84
19.50	1.12	29	55	84
20.50	1.18	29	56	85
21.50	1.24	30	55	85
22.50	1.30	30	56	86

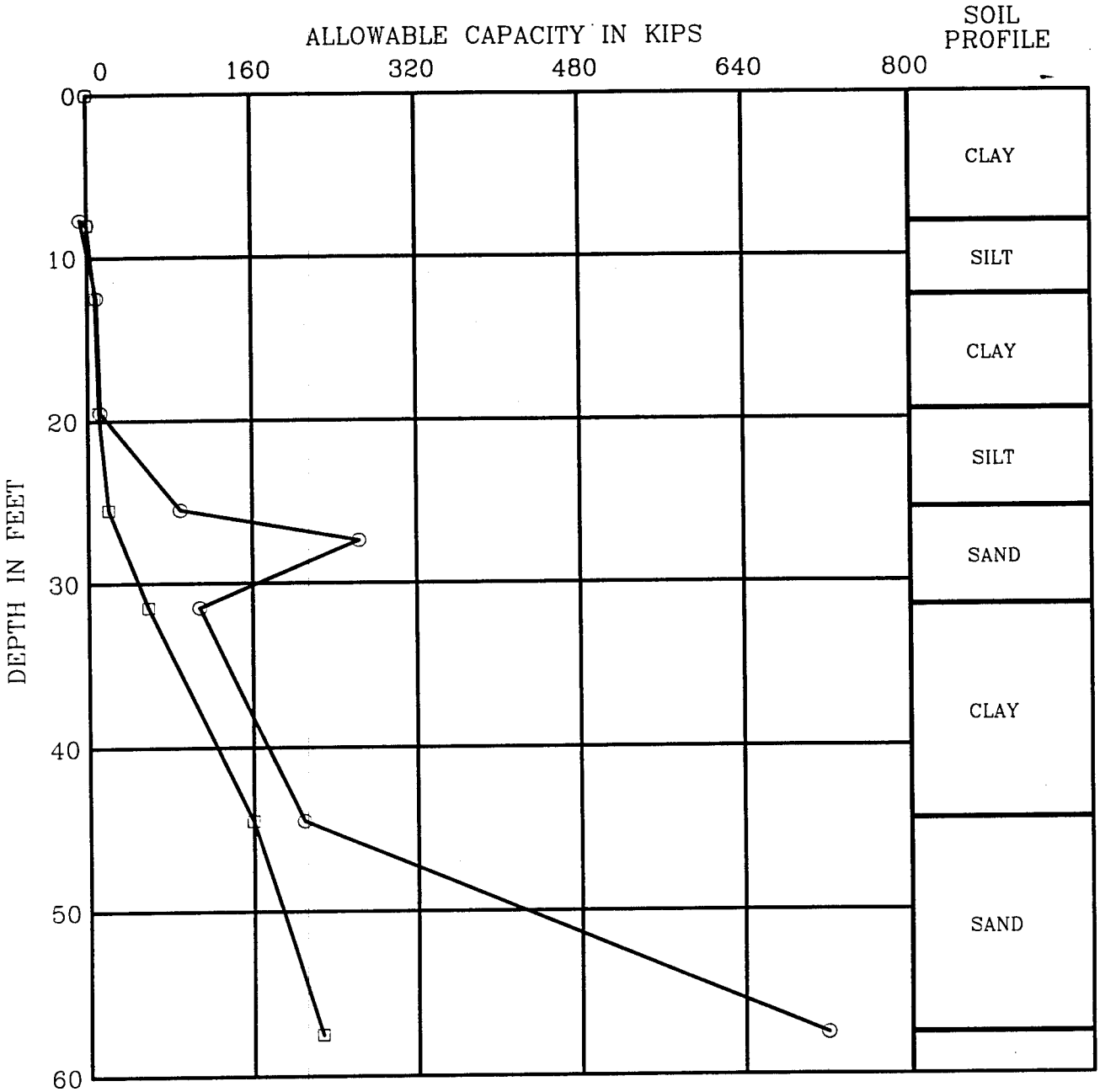
23.50	1.35	31	55	86
24.50	1.41	31	56	87
25.50	1.47	32	55	87
26.50	1.53	32	56	88
27.50	1.58	33	55	88
28.50	1.64	33	56	89
29.50	1.70	34	55	89
30.50	1.76	41	108	149
31.50	1.81	49	159	208
32.50	1.87	56	211	267
33.50	1.93	64	263	327
34.50	1.99	71	315	386
35.50	2.04	79	325	404
36.50	2.10	86	314	400
37.50	2.16	94	303	397
38.50	2.22	96	297	393
39.50	2.28	98	292	390
40.50	2.33	100	286	386
41.50	2.39	102	281	383
42.50	2.45	104	275	379
43.50	2.51	106	270	376
44.50	2.56	108	264	372
45.50	2.62	110	259	369
46.50	2.68	112	253	365
47.50	2.74	114	248	362
48.50	2.79	117	241	358
49.50	2.85	119	236	355
50.50	2.91	121	230	351
51.50	2.97	123	225	348
52.50	3.02	125	219	344
53.50	3.08	127	219	346
54.50	3.14	129	220	349
55.50	3.20	131	220	351
56.50	3.25	133	220	353
57.50	3.31	135	220	355



GROUP DELTA CONSULTANTS

CONE PENETRATION TEST RESULTS

PROJECT: Neptune Marina	CPT No.: C-04	FIGURE:
OWNER: Legacy Partners	TEST DATE: 06/09/05	
PROJECT No.: L-618	TESTED BY: Kehoe	



LEGEND
- □ SKIN FRICTION
- ○ TOTAL PILE CAPACITY

PILE DIAMETER	:	1.42 ft.
PILE TYPE	:	DRIVEN,LD
FACTOR OF SAFETY		
END BEARING	:	1.00
SKIN FRICTION	:	1.00

Static : 206/2 + 357/3 = 222 kips

Liquefaction downdrag : 30 kips

$F.S = \frac{563-30}{222+30} = 2.1$ For seismic downdrag

EE-C04	APGD Pile
Group Delta Consultants, Inc	ALLOWABLE PILE CAPACITY

```
*********************************************
*                                           *
*        AXIAL PILE CAPACITY PROGRAM        *
*                                           *
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*                                           *
*********************************************
```

"GEOSOFT "

"APGD Pile "

INPUT PILE DATA

NUMBER OF LAYERS	=	7	
PILE TYPE	=	DRIVEN,LD	
DIAMETER OF PILE	=	1.420	FEET
END AREA	=	1.580	FT*FT
PERIMETER	=	4.460	FEET
FRICTION FS	=	1.000	
END BEARING FS	=	1.000	
ULT. SETTL.	=	.800	INCH, FOR DRILLED PILES (DEFAULT = 0.05 * DIAMETER)

INPUT SOIL DATA

DEPTH FT	SOIL TYPE	UNIT WEIGHT PCF	COHESION KSF	FRICTION ANGLE	BLOW COUNT	CONE RESISTANCE-KSF TIP	SKIN
.0	CLAY	57.6	.000	.0	.0	.0	.0
8.0	CLAY	57.6	.000	.0	.0	.0	.0
8.0	SILT	57.6	.000	.0	.0	110.0	1.0
12.5	SILT	57.6	.000	.0	.0	110.0	1.0
12.5	CLAY	57.6	.000	.0	.0	34.8	.1
19.5	CLAY	57.6	.000	.0	.0	34.8	.1
19.5	SILT	57.6	.000	.0	.0	103.4	1.2
25.5	SILT	57.6	.000	.0	.0	103.4	1.2
25.5	SAND	57.6	.000	.0	.0	430.0	4.9
31.5	SAND	57.6	.000	.0	.0	430.0	4.9
31.5	CLAY	57.6	.000	.0	.0	106.0	3.5
44.5	CLAY	57.6	.000	.0	.0	106.0	3.5
44.5	SAND	57.6	.000	.0	.0	348.0	6.8
57.5	SAND	57.6	.000	.0	.0	348.0	6.8

INTERIM PILE CAPACITY TABLE

DEPTH FEET	PO KSF	UNIT SF KSF	UNIT EB KSF	***ULTIMATE PILE CAPACITY, KIP*** FRICTION	END	TOTAL
.0	.000	.00	0.	0.	0.	0.
8.0	.461	.00	0.	0.	0.	0.
8.0	.461	.37	62.	0.	98.	98.
12.5	.720	.37	97.	7.	153.	160.
12.5	.720	.11	1.	7.	2.	9.
19.5	1.123	.11	1.	11.	2.	12.
19.5	1.123	.34	103.	11.	163.	174.
25.5	1.469	.34	103.	20.	163.	183.
25.5	1.469	1.43	430.	20.	679.	699.
31.5	1.814	1.43	430.	58.	679.	738.
31.5	1.814	1.75	31.	58.	50.	108.
44.5	2.563	1.75	31.	160.	50.	209.
44.5	2.563	1.16	348.	160.	550.	709.
57.5	3.312	1.16	348.	227.	550.	777.

FINAL PILE CAPACITY TABLE

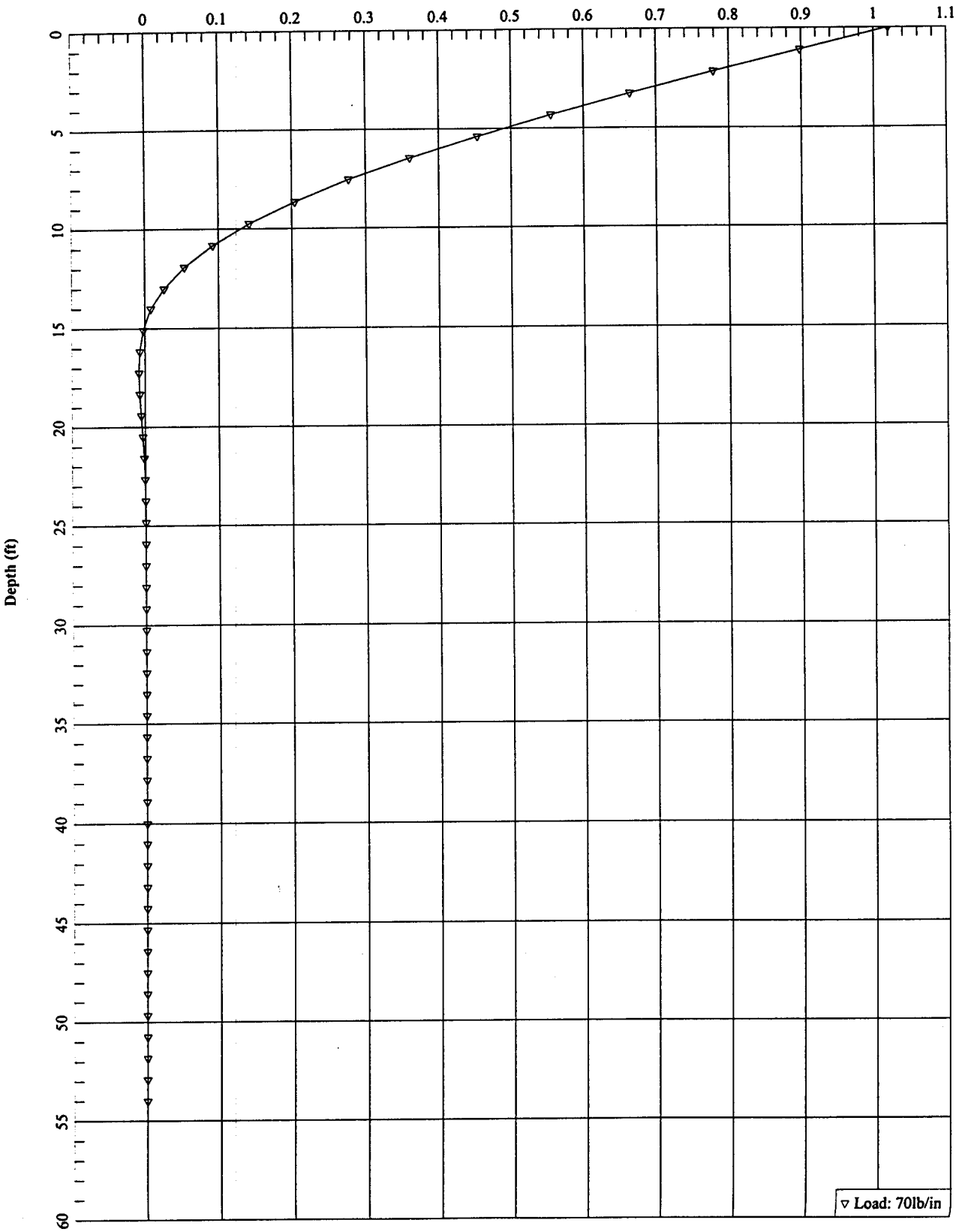
DEPTH FEET	PO KSF	******* ALLOWABLE CAPACITY, KIP ******* FRICTION	END	TOTAL
.00	.00	0	0	0
1.00	.06	0	0	0
2.00	.12	0	0	0
3.00	.17	0	0	0
4.00	.23	0	0	0
5.00	.29	0	0	0
6.00	.35	0	0	0
7.00	.40	0	0	0
8.00	.46	0	-7	-7
9.00	.52	2	-5	-3
10.00	.58	3	-3	0
11.00	.63	5	-2	3
12.50	.72	7	2	9
13.50	.78	8	1	9
14.50	.84	8	2	10
15.50	.89	9	1	10
16.50	.95	9	2	11
17.50	1.01	10	1	11
18.50	1.07	10	2	12
19.50	1.12	11	1	12
20.50	1.18	12	13	25

21.50	1.24	14	24	38
22.50	1.30	15	36	51
23.50	1.35	17	47	64
24.50	1.41	18	59	77
25.50	1.47	20	70	90
26.50	1.53	26	156	182
27.50	1.58	33	231	264
28.50	1.64	39	187	226
29.50	1.70	46	142	188
30.50	1.76	52	98	150
31.50	1.81	58	50	108
32.50	1.87	66	50	116
33.50	1.93	74	50	124
34.50	1.99	82	49	131
35.50	2.04	90	49	139
36.50	2.10	97	50	147
37.50	2.16	105	50	155
38.50	2.22	113	49	162
39.50	2.28	121	49	170
40.50	2.33	128	50	178
41.50	2.39	136	50	186
42.50	2.45	144	50	194
43.50	2.51	152	49	201
44.50	2.56	160	49	209
45.50	2.62	165	83	248
46.50	2.68	170	118	288
47.50	2.74	175	152	327
48.50	2.79	180	186	366
49.50	2.85	185	221	406
50.50	2.91	191	254	445
51.50	2.97	196	288	484
52.50	3.02	201	322	523
53.50	3.08	206	357	563
54.50	3.14	211	391	602
55.50	3.20	216	425	641
56.50	3.25	222	458	680
57.50	3.31	227	493	720

depth= 0 - 126; Soft clay	unit wt.= 0.042245 Ø= 0; c= 4.17
depth= 126 - 180; Sand	Ø= 35; c= 017
depth= 180 - 360; Soft clay	Ø= 0; c= 8.3
depth= 360 - 450; Sand	Ø= 36; c= 03
depth= 450 - 648; Stiff clay w/free water	Ø= 0; c= 5000

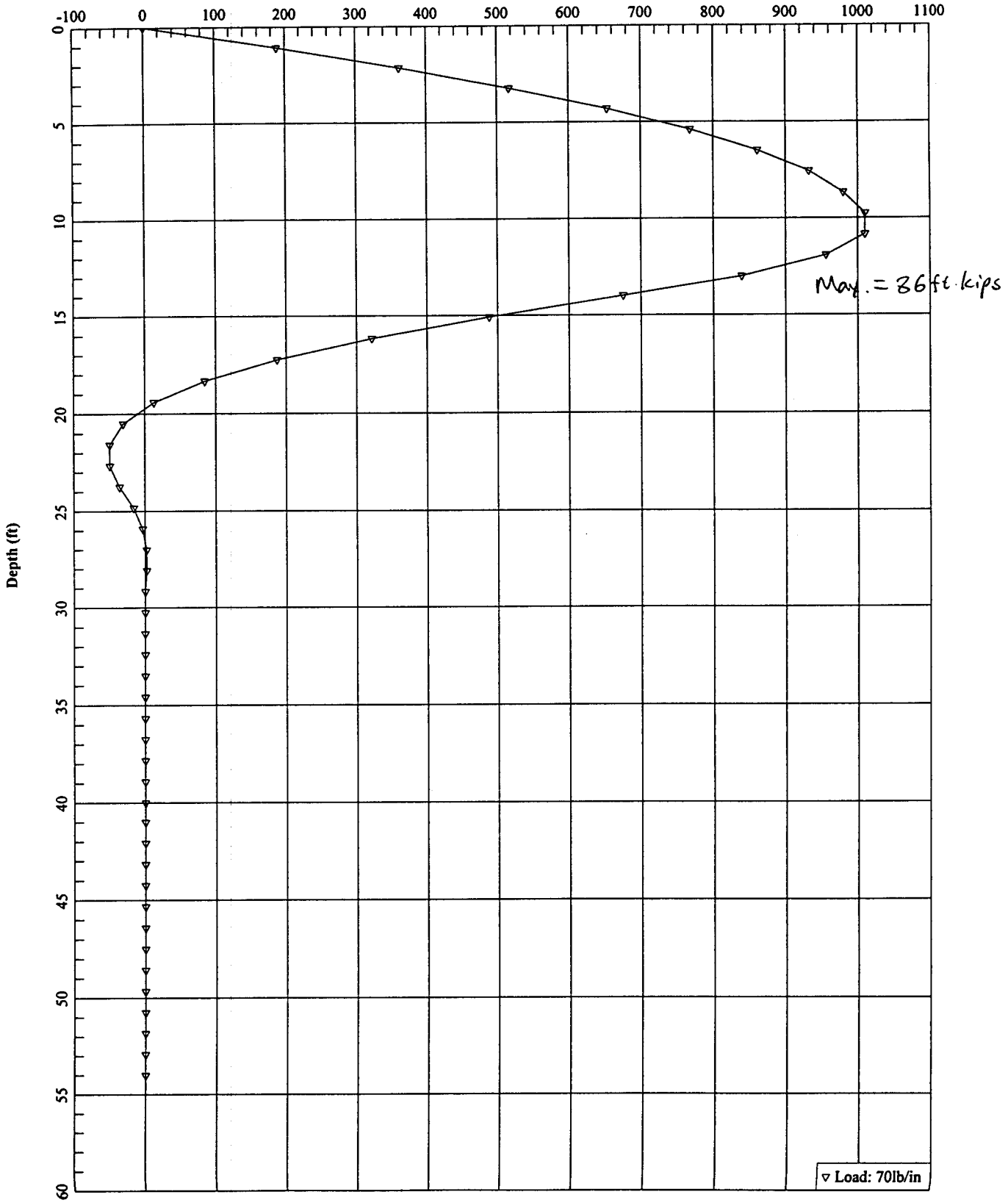
Lateral Pile Capacity under Seismic Loading

L-618: Lateral Pile Capacity



L-618 Lateral Pile Capacity

Bending Moment (in-kips)



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L-618 Neptune Marina: Analysis of Lateral Pile Deflection

UNITS--ENGLISH UNITS

INPUT INFORMATION

THE LOADING IS STATIC

PILE GEOMETRY AND PROPERTIES

PILE LENGTH = 648.00 IN
2 POINTS

X	DIAMETER	MOMENT OF INERTIA	AREA	MODULUS OF ELASTICITY
IN	IN	IN**4	IN**2	LBS/IN**2
.00	17.000	.410E+04	.227E+03	.360E+07
648.00	17.000	.410E+04	.227E+03	.360E+07

SOILS INFORMATION

X AT THE GROUND SURFACE = .00 IN

SLOPE ANGLE AT THE GROUND SURFACE = .00 DEG.

5 LAYER(S) OF SOIL

LAYER 1
THE SOIL IS A SOFT CLAY
X AT THE TOP OF THE LAYER = .00 IN
X AT THE BOTTOM OF THE LAYER = 126.00 IN
MODULUS OF SUBGRADE REACTION = .100E+03 LBS/IN**3

LAYER 2
THE SOIL IS A SAND - P-Y CRITERIA BY REESE ET AL, 1974
X AT THE TOP OF THE LAYER = 126.00 IN
X AT THE BOTTOM OF THE LAYER = 180.00 IN
MODULUS OF SUBGRADE REACTION = .125E+03 LBS/IN**3

LAYER 3
THE SOIL IS A SOFT CLAY
X AT THE TOP OF THE LAYER = 180.00 IN
X AT THE BOTTOM OF THE LAYER = 360.00 IN
MODULUS OF SUBGRADE REACTION = .100E+03 LBS/IN**3

LAYER 4
THE SOIL IS A SAND - P-Y CRITERIA BY REESE ET AL, 1974
X AT THE TOP OF THE LAYER = 360.00 IN
X AT THE BOTTOM OF THE LAYER = 450.00 IN
MODULUS OF SUBGRADE REACTION = .125E+03 LBS/IN**3

```
LAYER  5
THE SOIL IS A STIFF CLAY WITH WATER-INDUCED EROSION
X AT THE TOP OF THE LAYER          =     450.00 IN
X AT THE BOTTOM OF THE LAYER       =     648.00 IN
MODULUS OF SUBGRADE REACTION       =   .200E+03 LBS/IN**3


DISTRIBUTION OF EFFECTIVE UNIT WEIGHT WITH DEPTH
                    2 POINTS
            X,IN     WEIGHT,LBS/IN**3
             .00        .42E-01
          648.00        .42E-01

DISTRIBUTION OF STRENGTH PARAMETERS WITH DEPTH
                   10 POINTS
            X,IN       C,LBS/IN**2     PHI,DEGREES     E50
             .00       .417E+01           .000       .100E-01
          126.00       .417E+01           .000       .100E-01
          126.00       .000E+00       .350E+02       -----
          180.00       .000E+00       .350E+02       -----
          180.00       .830E+01           .000       .700E-02
          360.00       .830E+01           .000       .700E-02
          360.00       .000E+00       .360E+02       -----
          450.00       .000E+00       .360E+02       -----
          450.00       .500E+04           .000       .500E-02
          648.00       .500E+04           .000       .500E-02


BOUNDARY AND LOADING CONDITIONS
-------------------------------

    DISTRIBUTED LOAD CURVE           2 POINTS
                         X,IN      LOAD,LBS/IN
                          .00         .700E+02
                       126.00         .700E+02

    LOADING NUMBER   1

    BOUNDARY-CONDITION CODE                =          1
    LATERAL LOAD AT THE PILE HEAD          =   .150E+05 LBS
    MOMENT AT THE PILE HEAD                =   .000E+00 IN-LBS
    AXIAL LOAD AT THE PILE HEAD            =   .000E+00 LBS


FINITE-DIFFERENCE PARAMETERS
    NUMBER OF PILE INCREMENTS                                  =         50
    DEFLECTION TOLERANCE ON DETERMINATION OF CLOSURE           =   .100E-04 IN
    MAXIMUM NUMBER OF ITERATIONS ALLOWED FOR PILE ANALYSIS =        100
    MAXIMUM ALLOWABLE DEFLECTION                               =    .10E+03 IN


OUTPUT CODES
    KOUTPT =  1
    KPYOP  =  0
    INC    =  1


                O U T P U T   I N F O R M A T I O N
                ***********************************

          ************************************************
          * COMPUTE LOAD-DISTRIBUTION AND LOAD-DEFLECTION *
```

* CURVES FOR LATERAL LOADING *

DISTRIBUTED LOAD CURVE 2 POINTS

X,IN	LOAD,LBS/IN
.00	.700E+02
126.00	.700E+02

LOADING NUMBER 1

BOUNDARY CONDITION CODE = 1
LATERAL LOAD AT THE PILE HEAD = .150E+05 LBS
MOMENT AT THE PILE HEAD = .000E+00 IN-LBS
AXIAL LOAD AT THE PILE HEAD = .000E+00 LBS

X IN	DEFLECTION IN	MOMENT LBS-IN	SHEAR LBS	SLOPE RAD.	TOTAL STRESS LBS/IN**2	FLEXURAL RIGIDITY LBS-IN**2	SOIL REACTION LBS/IN
.0	.102E+01	.195E-07	.150E+05	-.937E-02	.405E-10	.148E+11	-.142E+03
13.0	.898E+00	.188E+06	.139E+05	-.929E-02	.391E+03	.148E+11	-.160E+03
25.9	.779E+00	.362E+06	.127E+05	-.904E-02	.750E+03	.148E+11	-.175E+03
38.9	.664E+00	.517E+06	.113E+05	-.866E-02	.107E+04	.148E+11	-.187E+03
51.8	.555E+00	.653E+06	.969E+04	-.814E-02	.135E+04	.148E+11	-.196E+03
64.8	.453E+00	.768E+06	.802E+04	-.752E-02	.159E+04	.148E+11	-.201E+03
77.8	.360E+00	.861E+06	.630E+04	-.680E-02	.179E+04	.148E+11	-.204E+03
90.7	.277E+00	.932E+06	.458E+04	-.602E-02	.193E+04	.148E+11	-.202E+03
103.7	.204E+00	.980E+06	.290E+04	-.518E-02	.203E+04	.148E+11	-.197E+03
116.6	.142E+00	.101E+07	.132E+04	-.430E-02	.209E+04	.148E+11	-.187E+03
129.6	.923E-01	.101E+07	-.197E+04	-.342E-02	.210E+04	.148E+11	-.390E+03
142.6	.538E-01	.956E+06	-.676E+04	-.255E-02	.198E+04	.148E+11	-.350E+03
155.5	.262E-01	.839E+06	-.108E+05	-.176E-02	.174E+04	.148E+11	-.276E+03
168.5	.807E-02	.675E+06	-.135E+05	-.110E-02	.140E+04	.148E+11	-.142E+03
181.4	-.233E-02	.488E+06	-.136E+05	-.589E-03	.101E+04	.148E+11	.126E+03
194.4	-.718E-02	.322E+06	-.116E+05	-.233E-03	.668E+03	.148E+11	.184E+03
207.4	-.837E-02	.187E+06	-.918E+04	-.912E-05	.388E+03	.148E+11	.193E+03
220.3	-.742E-02	.843E+05	-.672E+04	.110E-03	.175E+03	.148E+11	.185E+03
233.3	-.551E-02	.127E+05	-.443E+04	.153E-03	.263E+02	.148E+11	.168E+03
246.2	-.346E-02	-.306E+05	-.241E+04	.145E-03	.635E+02	.148E+11	.144E+03
259.2	-.176E-02	-.498E+05	-.733E+03	.109E-03	.103E+03	.148E+11	.115E+03
272.2	-.628E-03	-.496E+05	.540E+03	.657E-04	.103E+03	.148E+11	.815E+02
285.1	-.588E-04	-.358E+05	.131E+04	.282E-04	.742E+02	.148E+11	.370E+02
298.1	.103E-03	-.158E+05	.126E+04	.560E-05	.327E+02	.148E+11	-.445E+02
311.0	.862E-04	-.326E+04	.690E+03	-.276E-05	.676E+01	.148E+11	-.419E+02
324.0	.320E-04	.214E+04	.217E+03	-.325E-05	.443E+01	.148E+11	-.299E+02
337.0	.200E-05	.236E+04	-.767E+02	-.127E-05	.490E+01	.148E+11	-.109E+02
349.9	-.104E-05	.148E+03	-.876E+02	-.170E-06	.307E+00	.148E+11	.832E+01
362.9	-.239E-05	.949E+02	-.369E+01	-.629E-07	.197E+00	.148E+11	.421E-01
375.8	-.267E-05	.522E+02	-.283E+01	.167E-08	.108E+00	.148E+11	.505E-01
388.8	-.235E-05	.216E+02	-.192E+01	.341E-07	.449E-01	.148E+11	.474E-01
401.8	-.178E-05	.247E+01	-.113E+01	.447E-07	.513E-02	.148E+11	.382E-01
414.7	-.119E-05	-.757E+01	-.527E+00	.424E-07	.157E-01	.148E+11	.270E-01
427.7	-.684E-06	-.112E+02	-.131E+00	.342E-07	.232E-01	.148E+11	.164E-01
440.6	-.305E-06	-.110E+02	.884E-01	.245E-07	.227E-01	.148E+11	.778E-02
453.6	-.498E-07	-.890E+01	.159E+00	.157E-07	.185E-01	.148E+11	.704E-04
466.6	.104E-06	-.684E+01	.156E+00	.883E-08	.142E-01	.148E+11	-.295E-03
479.5	.179E-06	-.485E+01	.145E+00	.369E-08	.101E-01	.148E+11	-.845E-03
492.5	.199E-06	-.308E+01	.125E+00	.212E-09	.638E-02	.148E+11	-.131E-02
505.4	.185E-06	-.161E+01	.983E-01	-.185E-08	.335E-02	.148E+11	-.155E-02
518.4	.151E-06	-.528E+00	.694E-01	-.279E-08	.110E-02	.148E+11	-.155E-02

531.4	.112E-06	.184E+00	.424E-01	-.294E-08	.382E-03	.148E+11	-.136E-02
544.3	.753E-07	.570E+00	.201E-01	-.261E-08	.118E-02	.148E+11	-.105E-02
557.3	.447E-07	.705E+00	.390E-02	-.205E-08	.146E-02	.148E+11	-.707E-03
570.2	.222E-07	.671E+00	-.621E-02	-.144E-08	.139E-02	.148E+11	-.394E-03
583.2	.731E-08	.544E+00	-.111E-01	-.909E-09	.113E-02	.148E+11	-.146E-03
596.2	-.138E-08	.383E+00	-.122E-01	-.502E-09	.794E-03	.148E+11	.249E-04
609.1	-.571E-08	.229E+00	-.107E-01	-.233E-09	.475E-03	.148E+11	.128E-03
622.1	-.743E-08	.106E+00	-.776E-02	-.862E-10	.220E-03	.148E+11	.183E-03
635.0	-.794E-08	.278E-01	-.410E-02	-.274E-10	.576E-04	.148E+11	.211E-03
648.0	-.814E-08	.000E+00	.000E+00	-.152E-10	.000E+00	.148E+11	.233E-03

OUTPUT VERIFICATION

THE MAXIMUM MOMENT IMBALANCE FOR ANY ELEMENT = -.263E-07 IN-LBS
THE MAX. LATERAL FORCE IMBALANCE FOR ANY ELEMENT = -.154E-08 LBS

OUTPUT SUMMARY

PILE-HEAD DEFLECTION	=	.102E+01	IN
COMPUTED SLOPE AT PILE HEAD	=	-.937E-02	
MAXIMUM BENDING MOMENT	=	.101E+07	LBS-IN
MAXIMUM SHEAR FORCE	=	.150E+05	LBS
NO. OF ITERATIONS	=	22	
NO. OF ZERO DEFLECTION POINTS	=	5	

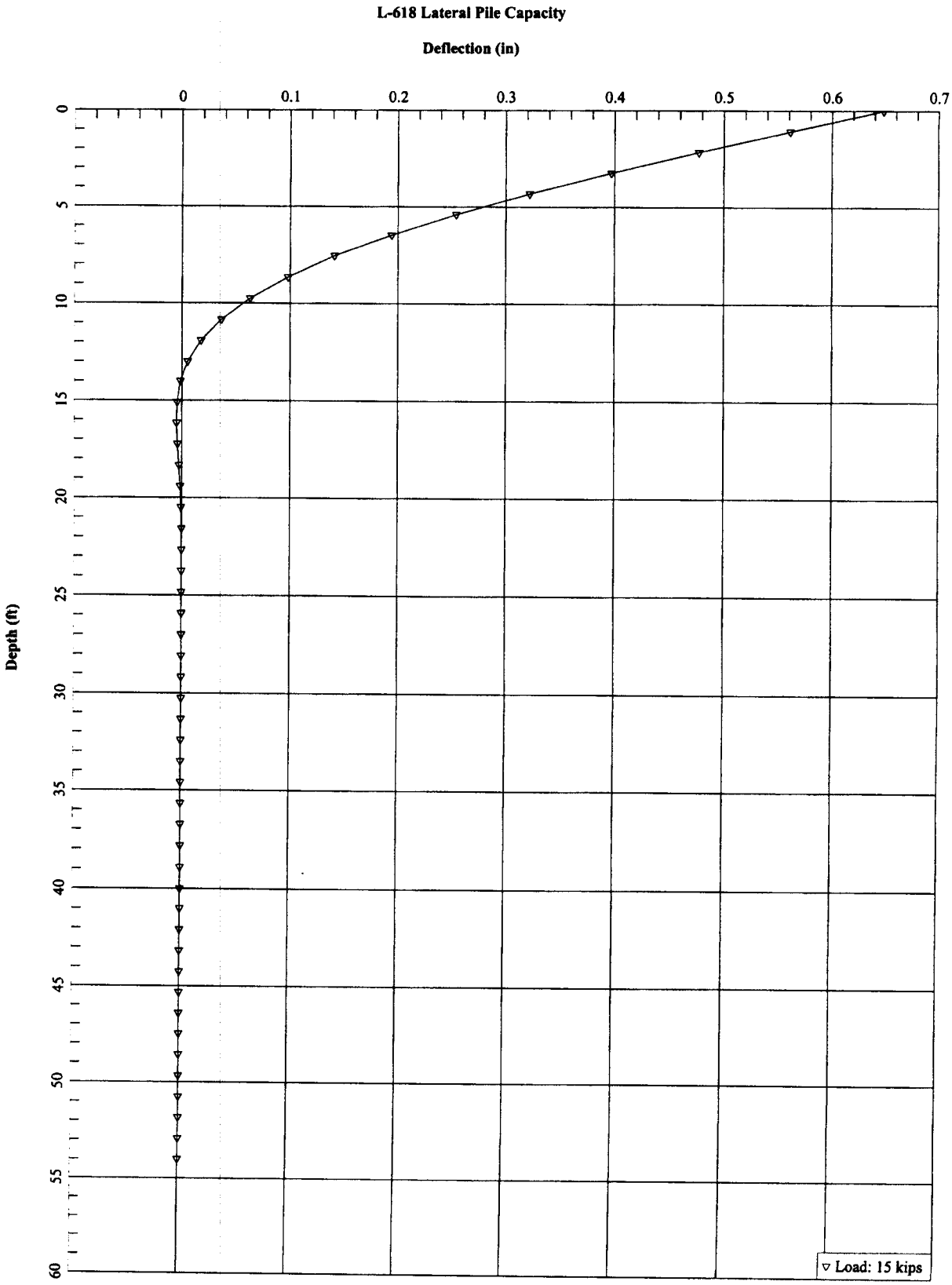
S U M M A R Y T A B L E
****

BOUNDARY CONDITION BC1	BOUNDARY CONDITION BC2	AXIAL LOAD LBS	PILE HEAD DEFLECTION IN	MAX. MOMENT IN-LBS	MAX. SHEAR LBS
.1500E+05	.0000E+00	.0000E+00	.1020E+01	.1014E+07	.1500E+05

DEFLECTION VS PILE LENGTH
****

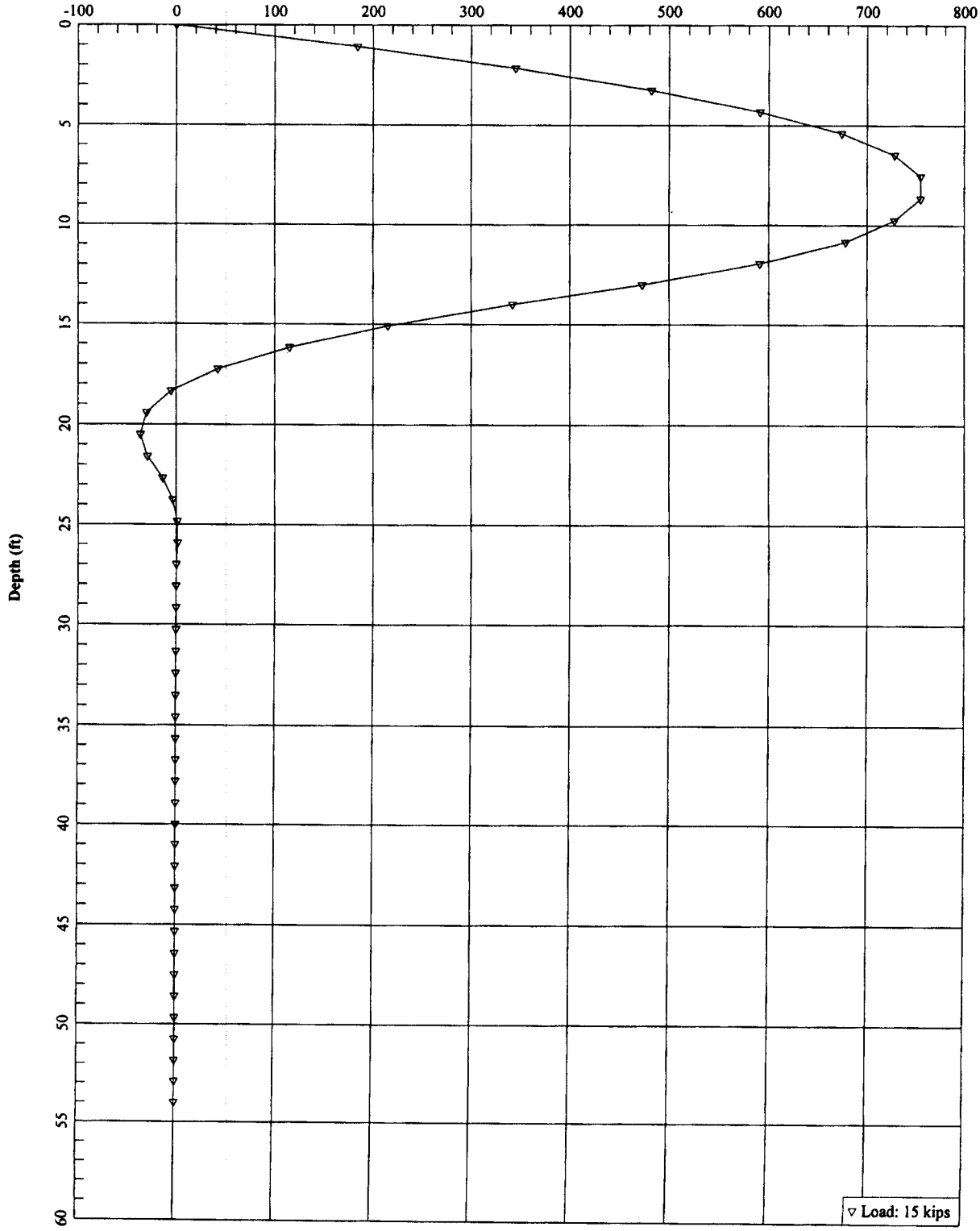
BOUNDARY CONDITION BC1	BOUNDARY CONDITION BC2	PILE LENGTH IN	PILE HEAD DEFLECTION IN	MAX. MOMENT IN-LBS	MAX. SHEAR LBS
.1500E+05	.0000E+00	.6480E+03	.1020E+01	.1014E+07	.1500E+05
.1500E+05	.0000E+00	.6156E+03	.1038E+01	.1001E+07	.1500E+05
.1500E+05	.0000E+00	.5832E+03	.1017E+01	.1015E+07	.1500E+05
.1500E+05	.0000E+00	.5508E+03	.1029E+01	.1005E+07	.1500E+05
.1500E+05	.0000E+00	.5184E+03	.1038E+01	.1001E+07	.1500E+05
.1500E+05	.0000E+00	.4860E+03	.1014E+01	.1016E+07	.1500E+05
.1500E+05	.0000E+00	.4536E+03	.1017E+01	.1014E+07	.1500E+05
.1500E+05	.0000E+00	.4212E+03	.1016E+01	.1014E+07	.1500E+05
.1500E+05	.0000E+00	.3888E+03	.1033E+01	.1002E+07	.1500E+05
.1500E+05	.0000E+00	.3564E+03	.1023E+01	.1009E+07	.1500E+05

Lateral Pile Capacity for Static Loading.



L 618 Lateral Pile Capacity

Bending Moment (in-kips)



Licensed to: Ying Liu

GDC

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L-618 Neptune Marina: Analysis of Lateral Pile Deflection

UNITS--ENGLISH UNITS

INPUT INFORMATION

THE LOADING IS STATIC

PILE GEOMETRY AND PROPERTIES

PILE LENGTH = 648.00 IN
2 POINTS

X	DIAMETER	MOMENT OF INERTIA	AREA	MODULUS OF ELASTICITY
IN	IN	IN**4	IN**2	LBS/IN**2
.00	17.000	.410E+04	.227E+03	.360E+07
648.00	17.000	.410E+04	.227E+03	.360E+07

SOILS INFORMATION

X AT THE GROUND SURFACE = .00 IN

```
SLOPE ANGLE AT THE GROUND SURFACE      =        .00 DEG.

5 LAYER(S) OF SOIL

LAYER  1
THE SOIL IS A SOFT CLAY
X AT THE TOP OF THE LAYER          =        .00 IN
X AT THE BOTTOM OF THE LAYER       =     126.00 IN
MODULUS OF SUBGRADE REACTION       =   .100E+03 LBS/IN**3

LAYER  2
THE SOIL IS A SAND - P-Y CRITERIA BY REESE ET AL, 1974
X AT THE TOP OF THE LAYER          =     126.00 IN
X AT THE BOTTOM OF THE LAYER       =     180.00 IN
MODULUS OF SUBGRADE REACTION       =   .125E+03 LBS/IN**3

LAYER  3
THE SOIL IS A SOFT CLAY
X AT THE TOP OF THE LAYER          =     180.00 IN
X AT THE BOTTOM OF THE LAYER       =     360.00 IN
MODULUS OF SUBGRADE REACTION       =   .100E+03 LBS/IN**3

LAYER  4
THE SOIL IS A SAND - P-Y CRITERIA BY REESE ET AL, 1974
X AT THE TOP OF THE LAYER          =     360.00 IN
X AT THE BOTTOM OF THE LAYER       =     450.00 IN
MODULUS OF SUBGRADE REACTION       =   .125E+03 LBS/IN**3

LAYER  5
THE SOIL IS A STIFF CLAY WITH WATER-INDUCED EROSION
X AT THE TOP OF THE LAYER          =     450.00 IN
X AT THE BOTTOM OF THE LAYER       =     648.00 IN
MODULUS OF SUBGRADE REACTION       =   .200E+03 LBS/IN**3


DISTRIBUTION OF EFFECTIVE UNIT WEIGHT WITH DEPTH
                    2 POINTS
            X,IN      WEIGHT,LBS/IN**3
             .00         .42E-01
          648.00         .42E-01

DISTRIBUTION OF STRENGTH PARAMETERS WITH DEPTH
                   10 POINTS
            X,IN       C,LBS/IN**2     PHI,DEGREES      E50
             .00       .417E+01           .000       .100E-01
          126.00       .417E+01           .000       .100E-01
          126.00       .000E+00       .350E+02       -----
          180.00       .000E+00       .350E+02       -----
```

180.00	.830E+01	:000	.700E-02
360.00	.830E+01	.000	.700E-02
360.00	.000E+00	.360E+02	-----
450.00	.000E+00	.360E+02	-----
450.00	.500E+04	.000	.500E-02
648.00	.500E+04	.000	.500E-02

BOUNDARY AND LOADING CONDITIONS

LOADING NUMBER 1

BOUNDARY-CONDITION CODE = 1
LATERAL LOAD AT THE PILE HEAD = .150E+05 LBS
MOMENT AT THE PILE HEAD = .000E+00 IN-LBS
AXIAL LOAD AT THE PILE HEAD = .000E+00 LBS

FINITE-DIFFERENCE PARAMETERS
NUMBER OF PILE INCREMENTS = 50
DEFLECTION TOLERANCE ON DETERMINATION OF CLOSURE = .100E-04 IN
MAXIMUM NUMBER OF ITERATIONS ALLOWED FOR PILE ANALYSIS = 100
MAXIMUM ALLOWABLE DEFLECTION = .10E+03 IN

OUTPUT CODES
KOUTPT = 1
KPYOP = 0
INC = 1

O U T P U T I N F O R M A T I O N
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*************************************************
* COMPUTE LOAD-DISTRIBUTION AND LOAD-DEFLECTION *
* CURVES FOR LATERAL LOADING                    *
*************************************************
```

LOADING NUMBER 1

BOUNDARY CONDITION CODE = 1
LATERAL LOAD AT THE PILE HEAD = .150E+05 LBS
MOMENT AT THE PILE HEAD = .000E+00 IN-LBS
AXIAL LOAD AT THE PILE HEAD = .000E+00 LBS

X IN	DEFLECTION IN	MOMENT LBS-IN	SHEAR LBS	SLOPE RAD.	TOTAL STRESS LBS/IN**2	FLEXURAL RIGIDITY LBS-IN**2	SOIL REACTION LBS/IN
*****	*********	*********	*********	*********	*********	*********	*********
.0	.648E+00	.293E-07	.150E+05	-.666E-02	.607E-10	.148E+11	-.122E+03
13.0	.561E+00	.184E+06	.133E+05	-.658E-02	.382E+03	.148E+11	-.137E+03
25.9	.477E+00	.345E+06	.115E+05	-.635E-02	.716E+03	.148E+11	-.148E+03
38.9	.397E+00	.482E+06	.950E+04	-.598E-02	.999E+03	.148E+11	-.157E+03
51.8	.322E+00	.591E+06	.742E+04	-.551E-02	.123E+04	.148E+11	-.163E+03
64.8	.254E+00	.674E+06	.529E+04	-.496E-02	.140E+04	.148E+11	-.166E+03
77.8	.194E+00	.728E+06	.314E+04	-.434E-02	.151E+04	.148E+11	-.166E+03
90.7	.141E+00	.755E+06	.101E+04	-.369E-02	.157E+04	.148E+11	-.162E+03
103.7	.980E-01	.755E+06	-.103E+04	-.303E-02	.157E+04	.148E+11	-.154E+03
116.6	.630E-01	.728E+06	-.296E+04	-.238E-02	.151E+04	.148E+11	-.143E+03
129.6	.364E-01	.678E+06	-.532E+04	-.176E-02	.141E+04	.148E+11	-.221E+03
142.6	.175E-01	.591E+06	-.790E+04	-.120E-02	.122E+04	.148E+11	-.177E+03
155.5	.526E-02	.473E+06	-.958E+04	-.734E-03	.982E+03	.148E+11	-.837E+02
168.5	-.156E-02	.342E+06	-.995E+04	-.376E-03	.709E+03	.148E+11	.274E+02
181.4	-.449E-02	.215E+06	-.875E+04	-.131E-03	.447E+03	.148E+11	.157E+03
194.4	-.496E-02	.115E+06	-.669E+04	.141E-04	.239E+03	.148E+11	.162E+03
207.4	-.412E-02	.422E+05	-.465E+04	.832E-04	.874E+02	.148E+11	.152E+03
220.3	-.280E-02	-.526E+04	-.279E+04	.994E-04	.109E+02	.148E+11	.134E+03
233.3	-.155E-02	-.301E+05	-.121E+04	.839E-04	.625E+02	.148E+11	.110E+03
246.2	-.631E-03	-.365E+05	.359E+02	.546E-04	.757E+02	.148E+11	.815E+02
259.2	-.132E-03	-.292E+05	.879E+03	.257E-04	.606E+02	.148E+11	.483E+02
272.2	.355E-04	-.137E+05	.992E+03	.687E-05	.285E+02	.148E+11	-.314E+02
285.1	.464E-04	-.348E+04	.570E+03	-.689E-06	.721E+01	.148E+11	-.342E+02
298.1	.177E-04	.104E+04	.188E+03	-.176E-05	.216E+01	.148E+11	-.247E+02
311.0	.816E-06	.139E+04	-.356E+02	-.692E-06	.287E+01	.148E+11	-.856E+01
324.0	-.271E-06	.119E+03	-.544E+02	-.315E-07	.247E+00	.148E+11	.590E+01
337.0	-.156E-09	-.238E+02	-.460E+01	.104E-07	.493E-01	.148E+11	.368E+00
349.9	.696E-12	-.688E-02	.916E+00	.908E-11	.143E-04	.148E+11	-.651E-01
362.9	.793E-10	-.463E-02	.160E-03	.403E-11	.960E-05	.148E+11	-.754E-06
375.8	.105E-09	-.272E-02	.129E-03	.802E-12	.564E-05	.148E+11	-.106E-05
388.8	.100E-09	-.129E-02	.916E-04	-.959E-12	.268E-05	.148E+11	-.107E-05
401.8	.803E-10	-.346E-03	.570E-04	-.168E-11	.717E-06	.148E+11	-.907E-06
414.7	.566E-10	.188E-03	.295E-04	-.175E-11	.390E-06	.148E+11	-.673E-06
427.7	.350E-10	.417E-03	.101E-04	-.148E-11	.866E-06	.148E+11	-.438E-06
440.6	.182E-10	.449E-03	-.175E-05	-.110E-11	.930E-06	.148E+11	-.238E-06
453.6	.648E-11	.372E-03	-.598E-05	-.740E-12	.772E-06	.148E+11	-.416E-08
466.6	-.992E-12	.294E-03	-.603E-05	-.448E-12	.609E-06	.148E+11	.161E-08
479.5	-.512E-11	.216E-03	-.577E-05	-.224E-12	.448E-06	.148E+11	.132E-07
492.5	-.679E-11	.144E-03	-.512E-05	-.656E-13	.299E-06	.148E+11	.240E-07
505.4	-.682E-11	.833E-04	-.417E-05	.343E-13	.173E-06	.148E+11	.307E-07
518.4	-.590E-11	.362E-04	-.307E-05	.867E-13	.751E-07	.148E+11	.322E-07
531.4	-.457E-11	.371E-05	-.199E-05	.104E-12	.770E-08	.148E+11	.294E-07
544.3	-.320E-11	-.155E-04	-.107E-05	.991E-13	.321E-07	.148E+11	.236E-07
557.3	-.201E-11	-.240E-04	-.365E-06	.817E-13	.498E-07	.148E+11	.167E-07

570.2	-.108E-11	-.249E-04	.104E-06	.602E-13	.517E-07	.148E+11	.101E-07
583.2	-.446E-12	-.213E-04	.360E-06	.399E-13	.442E-07	.148E+11	.457E-08
596.2	-.500E-13	-.156E-04	.449E-06	.237E-13	.324E-07	.148E+11	.557E-09
609.1	.168E-12	-.967E-05	.423E-06	.126E-13	.201E-07	.148E+11	-.205E-08
622.1	.276E-12	-.465E-05	.324E-06	.629E-14	.964E-08	.148E+11	-.363E-08
635.0	.331E-12	-.127E-05	.179E-06	.369E-14	.263E-08	.148E+11	-.467E-08
648.0	.372E-12	.000E+00	.000E+00	.313E-14	.000E+00	.148E+11	-.560E-08

OUTPUT VERIFICATION

THE MAXIMUM MOMENT IMBALANCE FOR ANY ELEMENT = .103E-07 IN-LBS
THE MAX. LATERAL FORCE IMBALANCE FOR ANY ELEMENT = .131E-08 LBS

OUTPUT SUMMARY

PILE-HEAD DEFLECTION = .648E+00 IN
COMPUTED SLOPE AT PILE HEAD = -.666E-02
MAXIMUM BENDING MOMENT = .755E+06 LBS-IN
MAXIMUM SHEAR FORCE = .150E+05 LBS
NO. OF ITERATIONS = 22
NO. OF ZERO DEFLECTION POINTS = 6

S U M M A R Y T A B L E
****

BOUNDARY CONDITION BC1	BOUNDARY CONDITION BC2	AXIAL LOAD LBS	PILE HEAD DEFLECTION IN	MAX. MOMENT IN-LBS	MAX. SHEAR LBS
.1500E+05	.0000E+00	.0000E+00	.6478E+00	.7552E+06	.1500E+05

DEFLECTION VS PILE LENGTH
****

BOUNDARY CONDITION BC1	BOUNDARY CONDITION BC2	PILE LENGTH IN	PILE HEAD DEFLECTION IN	MAX. MOMENT IN-LBS	MAX. SHEAR LBS
.1500E+05	.0000E+00	.6480E+03	.6478E+00	.7552E+06	.1500E+05
.1500E+05	.0000E+00	.6156E+03	.6516E+00	.7560E+06	.1500E+05
.1500E+05	.0000E+00	.5832E+03	.6470E+00	.7572E+06	.1500E+05
.1500E+05	.0000E+00	.5508E+03	.6497E+00	.7563E+06	.1500E+05
.1500E+05	.0000E+00	.5184E+03	.6514E+00	.7548E+06	.1500E+05
.1500E+05	.0000E+00	.4860E+03	.6462E+00	.7580E+06	.1500E+05
.1500E+05	.0000E+00	.4536E+03	.6466E+00	.7570E+06	.1500E+05
.1500E+05	.0000E+00	.4212E+03	.6463E+00	.7563E+06	.1500E+05
.1500E+05	.0000E+00	.3888E+03	.6501E+00	.7547E+06	.1500E+05
.1500E+05	.0000E+00	.3564E+03	.6477E+00	.7559E+06	.1500E+05

APPENDIX F
Calculation for Temporary Shoring

GROUP DELTA CONSULTANTS

Sheet pile

$\sigma_a = K_a \cdot \sigma_v - 2c\sqrt{K_a}$; $K_a = \tan^2(45° - \frac{\phi}{2}) = 0.27$

$\sigma_{v_1} = 120 \times (12-4) = 960$ psf

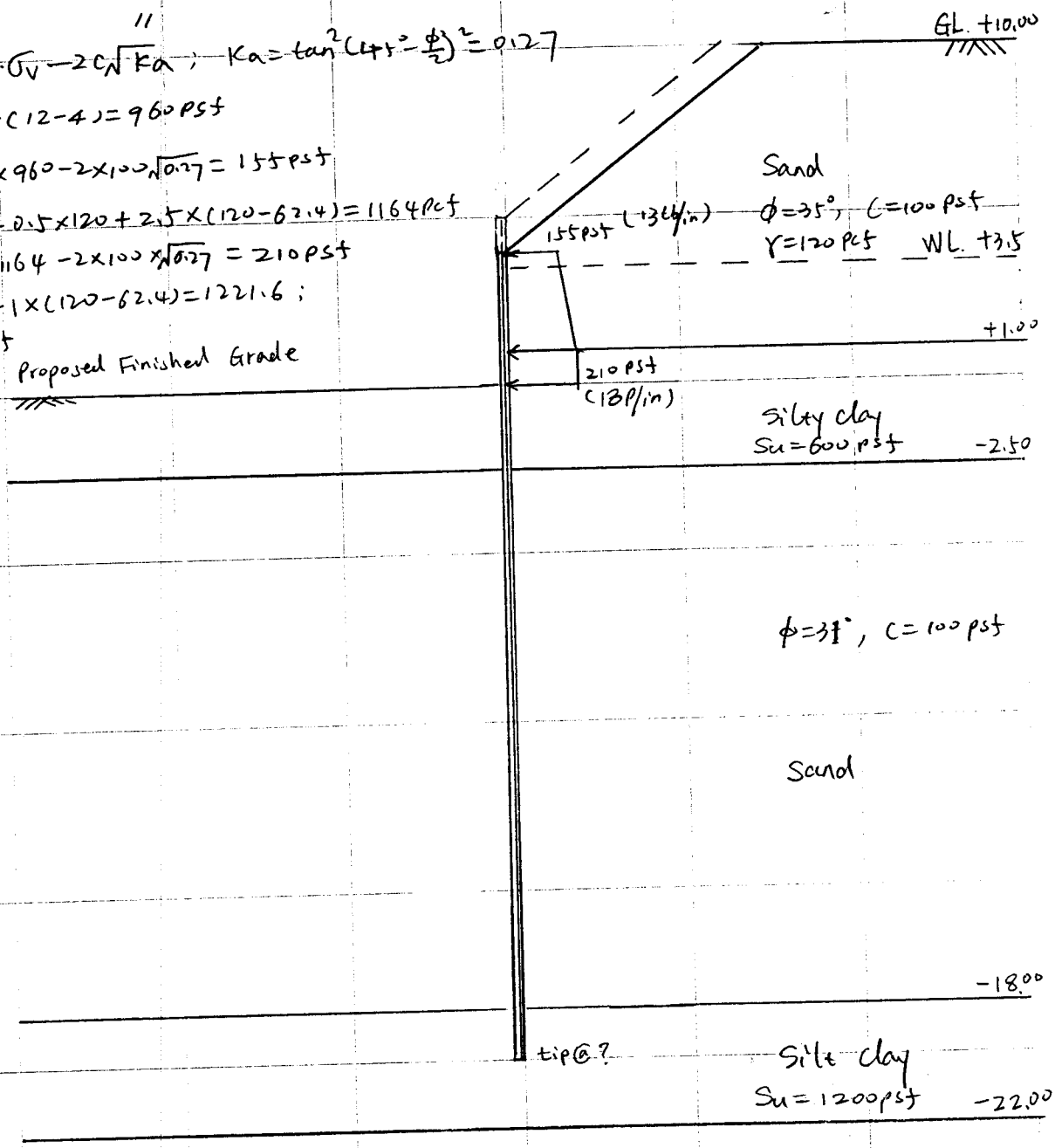
$\sigma_{a_1} = 0.27 \times 960 - 2 \times 100\sqrt{0.27} = 155$ psf

$\sigma_{v_2} = 960 + 0.5 \times 120 + 2.5 \times (120 - 62.4) = 1164$ psf

$\sigma_{a_2} = 0.27 \times 1164 - 2 \times 100 \times \sqrt{0.27} = 210$ psf

$\sigma_{v_3} = 1164 + 1 \times (120 - 62.4) = 1221.6$;

$\sigma_{a_3} = 210$ psf



Pile tip at −15', total length of sheet pile 20'

GROUP DELTA CONSULTANTS

PROJECT NAME _____ DRAWN BY _____

CHECKED BY _____

PROJECT NUMBER _____ DATE _____ PAGE _____ OF _____

Marina2.out

20 ft sheetpile

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CANTILEVER SHEETPILE WALL, PZ22, 20 ft long USING P-Y CURVES

PROGRAM CONTROL DATA

NUMBER OF LINES THIS PROBLEM

TABLE NO.	LINES
********	*****
1	1
2	1
3	0
4	4
5	7

TABLE 1 - CONSTANTS

NUMBER OF INCREMENTS	=	20	
INCREMENT LENGTH	=	12	INCHES
NO. OF ITERATIONS	=	20	

TABLE 2 - ITERATION CONTROL DATA

MAXIMUM ALLOWABLE DEFLECTION	=	12	INCHES
DEFLECTION TOLERANCE	=	.001	INCHES

TABLE 3 - SPECIFIED DEFLECTION AND SLOPES

STA	CASE	DEFLECTION	SLOPE
	NONE		

TABLE 4 - STIFFNESS AND LOAD DATA

FROM	TO	CONTD	F	Q	S	T	R	P
0		1	0.253D+10	0.000D+00	0.000D+00	0.000D+00	0.000D+00	0.000D+00
	1	1	0.253D+10	0.500D+02	0.000D+00	0.000D+00	0.000D+00	0.000D+00
	5	1	0.253D+10	0.406D+03	0.000D+00	0.000D+00	0.000D+00	0.000D+00
	20	0	0.253D+10	0.000D+00	0.000D+00	0.000D+00	0.000D+00	0.000D+00

CANTILEVER SHEETPILE WALL, PZ22, 20 ft long USING P-Y CURVES

TABLE 5A-- SOIL DATA

INPUT DATA FOR COMPUTING P-Y CURVES
***** **** *** ********* *** ******

NO. OF LAYERS = 2
STATION NO. AT TOP OF FIRST SOIL LAYER = 5

INPUT DATA FOR LAYER NO.= 1 SOIL TYPE= CLAY

DEPTH, INCH.	DIAM., INCH.	C , PSI	GAMMA, PCI	E50, IN/IN.	BETA, DEG.	CONST, -	SLOPE FACTOR
0.000	12.000	4.000	0.029	0.010	0.000	0.330	1.000

INPUT DATA FOR LAYER NO.= 1 SOIL TYPE= CLAY

DEPTH, INCH.	DIAM., INCH.	C , PSI	GAMMA, PCI	E50, IN/IN.	BETA, DEG.	CONST, -	SLOPE FACTOR
36.000	12.000	4.000	0.029	0.010	0.000	0.330	1.000

INPUT DATA FOR LAYER NO. = 2 SOIL TYPE = SAND

DEPTH, INCH.	DIAM., INCH.	PHI , DEGREE	GAMMA, PCI	DR , PERCENT	BETA, DEG.	CONST, -	SLOPE FACTOR
36.000	12.000	30.000	0.029	45.000	0.000	0.170	1.000

INPUT DATA FOR LAYER NO. = 2 SOIL TYPE = SAND

DEPTH, INCH.	DIAM., INCH.	PHI , DEGREE	GAMMA, PCI	DR , PERCENT	BETA, DEG.	CONST, -	SLOPE FACTOR
240.000	12.000	30.000	0.029	45.000	0.000	0.170	1.000

P - Y DATA
****

DEPTH TO P-Y CURVE, IN.	Y-IN.	P, LB/IN.
0.000	0.000	0.000
0.000	0.038	11.888
0.000	0.075	14.975
0.000	0.150	18.863
0.000	0.300	23.760
0.000	0.600	29.929
0.000	1.200	37.699
0.000	2.400	47.487
0.000	12.000	47.520
36.000	0.000	0.000
36.000	0.038	18.867
36.000	0.075	23.765
36.000	0.150	29.935
36.000	0.300	37.707
36.000	0.600	47.497
36.000	1.200	59.829
36.000	2.400	75.362

36.000	12.000	75.414
36.000	0.000	0.000
36.000	0.012	12.338
36.000	0.030	21.481
36.000	0.060	28.641
36.000	0.120	30.845
36.000	0.199	32.916
36.000	0.300	35.802
36.000	0.900	49.572
36.000	12.000	49.572
240.000	0.000	0.000
240.000	0.012	82.253
240.000	0.030	143.208
240.000	0.060	190.944
240.000	0.120	205.632
240.000	0.199	219.439
240.000	0.300	238.680
240.000	0.900	330.480
240.000	12.000	330.480

CANTILEVER SHEETPILE WALL, PZ22, 20 ft long USING P-Y CURVES

TABLE 6-- ITERATION MONITER DATA

ITER NUM	NUB STAS NOT CLOSED	DEFLS AT STAS NUMS 0	10	15	18	20
0	19	0.248D+00	0.309D-01	0.670D-03	-.135D-02	-.153D-02
0	20	0.437D+00	0.737D-01	0.282D-02	-.441D-02	-.572D-02
0	19	0.491D+00	0.912D-01	0.561D-02	-.522D-02	-.791D-02
0	13	0.495D+00	0.927D-01	0.606D-02	-.522D-02	-.814D-02
0	0	0.495D+00	0.927D-01	0.606D-02	-.522D-02	-.814D-02

CANTILEVER SHEETPILE WALL, PZ22, 20 ft long USING P-Y CURVES

TABLE 7-- RESULTS ITERATION 5

STA I NO. -	X DEPTH INCH.	W DEFLE INCH.	DW/DX SLOPE IN./IN.	M BEND.MOM LBS-IN.	DM/DX SHEAR LBS.	NET REACT - LBS.
-1	-12	0.538	-.362D-02	0.000D+00	0.000D+00	0.000D+00
0	0	0.495	-.362D-02	0.000D+00	0.000D+00	0.000D+00
1	12	0.451	-.362D-02	0.000D+00	0.250D+02	0.500D+02
2	24	0.408	-.362D-02	0.600D+03	0.120D+03	0.139D+03
3	36	0.364	-.361D-02	0.287D+04	0.303D+03	0.228D+03
4	48	0.321	-.358D-02	0.787D+04	0.575D+03	0.317D+03
5	60	0.278	-.353D-02	0.167D+05	0.868D+03	0.268D+03
6	72	0.236	-.342D-02	0.287D+05	0.104D+04	0.678D+02
7	84	0.196	-.325D-02	0.415D+05	0.108D+04	0.117D+02
8	96	0.158	-.302D-02	0.545D+05	0.106D+04	-.485D+02
9	108	0.124	-.274D-02	0.669D+05	0.934D+03	-.197D+03
10	120	0.093	-.239D-02	0.769D+05	0.672D+03	-.326D+03
11	132	0.066	-.202D-02	0.830D+05	0.285D+03	-.449D+03
12	144	0.044	-.162D-02	0.838D+05	-.181D+03	-.481D+03
13	156	0.027	-.123D-02	0.787D+05	-.648D+03	-.455D+03
14	168	0.015	-.886D-03	0.682D+05	-.104D+04	-.332D+03
15	180	0.006	-.597D-03	0.537D+05	-.126D+04	-.114D+03
16	192	0.000	-.380D-03	0.378D+05	-.128D+04	0.889D+02
17	204	-0.003	-.236D-03	0.230D+05	-.112D+04	0.232D+03
18	216	-0.005	-.155D-03	0.110D+05	-.834D+03	0.333D+03
19	228	-0.007	-.121D-03	0.301D+04	-.459D+03	0.417D+03
20	240	-0.008	-.114D-03	0.000D+00	-.126D+03	0.251D+03
21	252	-0.010	-.114D-03	0.000D+00	0.000D+00	0.000D+00

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CANTILEVER SHEETPILE WALL, PZ22, 15 ft long USING P-Y CURVES

PROGRAM CONTROL DATA

NUMBER OF LINES THIS PROBLEM

TABLE NO.	LINES
********	*****
1	1
2	1
3	0
4	4
5	7

TABLE 1 - CONSTANTS

NUMBER OF INCREMENTS	=	15	
INCREMENT LENGTH	=	12	INCHES
NO. OF ITERATIONS	=	20	

TABLE 2 - ITERATION CONTROL DATA

MAXIMUM ALLOWABLE DEFLECTION	=	12	INCHES
DEFLECTION TOLERANCE	=	.001	INCHES

TABLE 3 - SPECIFIED DEFLECTION AND SLOPES

STA	CASE	DEFLECTION	SLOPE
	NONE		

TABLE 4 - STIFFNESS AND LOAD DATA

FROM	TO	CONTD	F	Q	S	T	R	P
0		1	0.253D+10	0.000D+00	0.000D+00	0.000D+00	0.000D+00	0.000D+00
	1	1	0.253D+10	0.500D+02	0.000D+00	0.000D+00	0.000D+00	0.000D+00
	5	1	0.253D+10	0.406D+03	0.000D+00	0.000D+00	0.000D+00	0.000D+00
	15	0	0.253D+10	0.000D+00	0.000D+00	0.000D+00	0.000D+00	0.000D+00

CANTILEVER SHEETPILE WALL, PZ22, 15 ft long USING P-Y CURVES

TABLE 5A-- SOIL DATA

INPUT DATA FOR COMPUTING P-Y CURVES
***** **** *** ********* *** ******

NO. OF LAYERS = 2
STATION NO. AT TOP OF FIRST SOIL LAYER = 5

INPUT DATA FOR LAYER NO.= 1 SOIL TYPE= CLAY

DEPTH, INCH.	DIAM., INCH.	C , PSI	GAMMA, PCI	E50, IN/IN.	BETA, DEG.	CONST, -	SLOPE FACTOR
0.000	12.000	4.000	0.029	0.010	0.000	0.330	1.000

INPUT DATA FOR LAYER NO.= 1 SOIL TYPE= CLAY

DEPTH, INCH.	DIAM., INCH.	C , PSI	GAMMA, PCI	E50, IN/IN.	BETA, DEG.	CONST, -	SLOPE FACTOR

36.000	12.000	4.000	0.029	0.010	0.000	0.330	1.000

INPUT DATA FOR LAYER NO. = 2 SOIL TYPE = SAND

DEPTH, INCH.	DIAM., INCH.	PHI , DEGREE	GAMMA, PCI	DR , PERCENT	BETA, DEG.	CONST, -	SLOPE FACTOR
36.000	12.000	30.000	0.029	45.000	0.000	0.170	1.000

INPUT DATA FOR LAYER NO. = 2 SOIL TYPE = SAND

DEPTH, INCH.	DIAM., INCH.	PHI , DEGREE	GAMMA, PCI	DR , PERCENT	BETA, DEG.	CONST, -	SLOPE FACTOR
240.000	12.000	30.000	0.029	45.000	0.000	0.170	1.000

P - Y DATA
****

DEPTH TO P-Y CURVE, IN.	Y-IN.	P, LB/IN.
0.000	0.000	0.000
0.000	0.038	11.888
0.000	0.075	14.975
0.000	0.150	18.863
0.000	0.300	23.760
0.000	0.600	29.929
0.000	1.200	37.699
0.000	2.400	47.487
0.000	12.000	47.520
36.000	0.000	0.000
36.000	0.038	18.867
36.000	0.075	23.765
36.000	0.150	29.935
36.000	0.300	37.707
36.000	0.600	47.497
36.000	1.200	59.829
36.000	2.400	75.362
36.000	12.000	75.414
36.000	0.000	0.000
36.000	0.012	12.338
36.000	0.030	21.481
36.000	0.060	28.641

36.000	0.120	30.845
36.000	0.199	32.916
36.000	0.300	35.802
36.000	0.900	49.572
36.000	12.000	49.572
240.000	0.000	0.000
240.000	0.012	82.253
240.000	0.030	143.208
240.000	0.060	190.944
240.000	0.120	205.632
240.000	0.199	219.439
240.000	0.300	238.680
240.000	0.900	330.480
240.000	12.000	330.480

CANTILEVER SHEETPILE WALL, PZ22, 15 ft long USING P-Y CURVES

TABLE 6-- ITERATION MONITER DATA

ITER NUM	NUB STAS NOT CLOSED	DEFLS AT STAS NUMS 0	5	10	13	15
0	16	0.262D+00	0.133D+00	0.309D-01	-.236D-02	-.191D-01
0	16	0.572D+00	0.320D+00	0.968D-01	0.916D-03	-.533D-01
0	16	0.910D+00	0.531D+00	0.182D+00	0.817D-02	-.973D-01
0	15	0.110D+01	0.648D+00	0.226D+00	0.810D-02	-.128D+00
0	10	0.110D+01	0.651D+00	0.227D+00	0.796D-02	-.129D+00
0	0	0.110D+01	0.651D+00	0.227D+00	0.796D-02	-.129D+00

CANTILEVER SHEETPILE WALL, PZ22, 15 ft long USING P-Y CURVES

TABLE 7-- RESULTS ITERATION 6

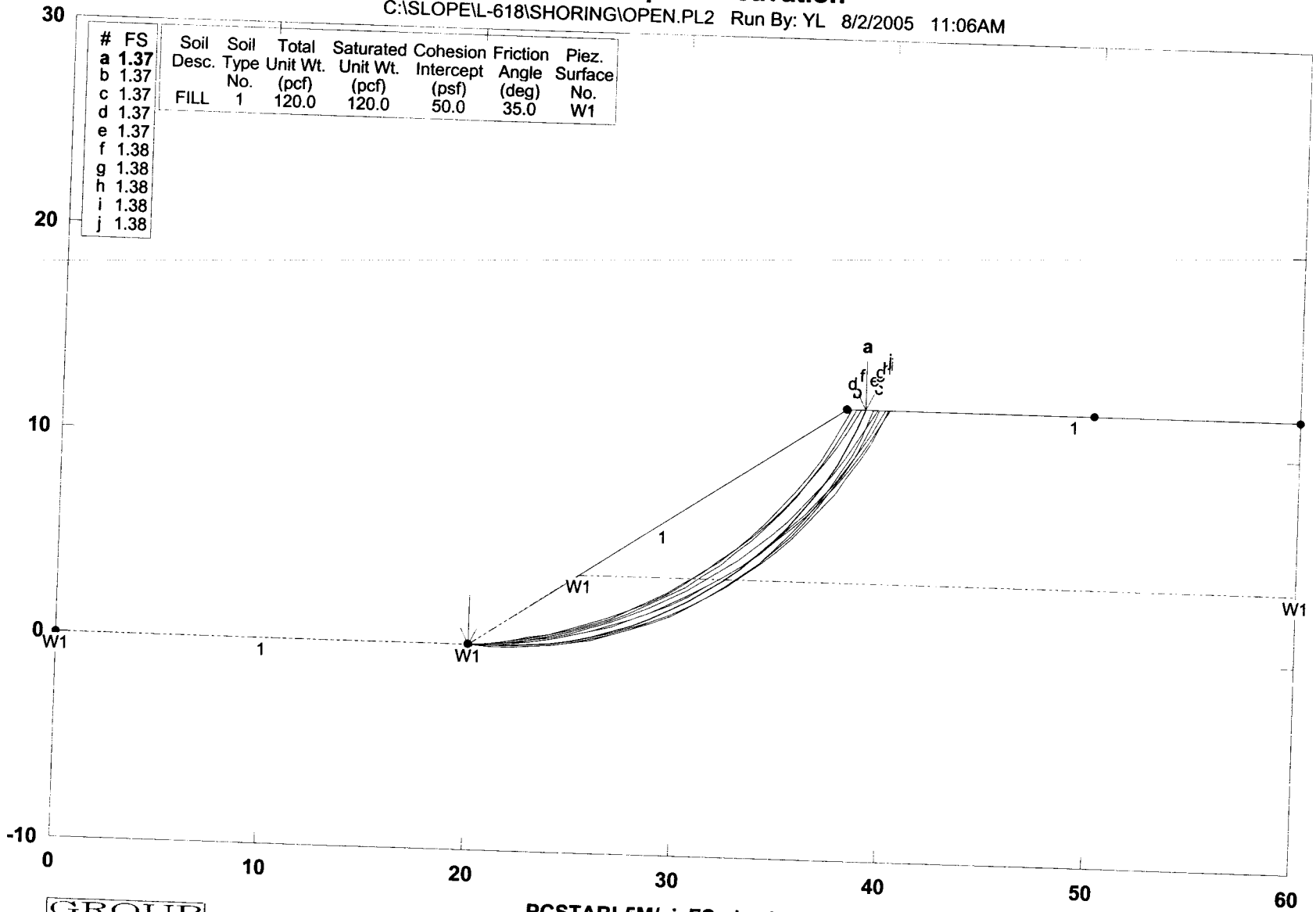
STA I NO. -	X DEPTH INCH.	W DEFLE INCH.	DW/DX SLOPE IN./IN.	M BEND.MOM LBS-IN.	DM/DX SHEAR LBS.	NET REACT - LBS.
-1	-12	1.194	-.756D-02	0.000D+00	0.000D+00	0.000D+00
0	0	1.103	-.756D-02	0.000D+00	0.000D+00	0.000D+00
1	12	1.013	-.756D-02	0.000D+00	0.250D+02	0.500D+02
2	24	0.922	-.755D-02	0.600D+03	0.119D+03	0.139D+03
3	36	0.831	-.755D-02	0.287D+04	0.303D+03	0.228D+03
4	48	0.741	-.752D-02	0.787D+04	0.576D+03	0.317D+03
5	60	0.651	-.746D-02	0.167D+05	0.845D+03	0.222D+03
6	72	0.562	-.736D-02	0.282D+05	0.930D+03	-.527D+02
7	84	0.474	-.720D-02	0.390D+05	0.838D+03	-.132D+03
8	96	0.389	-.699D-02	0.483D+05	0.679D+03	-.187D+03
9	108	0.306	-.674D-02	0.553D+05	0.420D+03	-.332D+03
10	120	0.227	-.648D-02	0.583D+05	0.182D+02	-.471D+03
11	132	0.151	-.620D-02	0.557D+05	-.516D+03	-.597D+03
12	144	0.078	-.596D-02	0.460D+05	-.116D+04	-.699D+03
13	156	0.008	-.579D-02	0.278D+05	-.160D+04	-.181D+03
14	168	-0.061	-.570D-02	0.746D+04	-.116D+04	0.107D+04
15	180	-0.129	-.569D-02	0.305D-10	-.311D+03	0.622D+03
16	192	-0.197	-.569D-02	0.000D+00	-.127D-11	0.254D-11

L-618 Open Excavation

C:\SLOPE\L-618\SHORING\OPEN.PL2 Run By: YL 8/2/2005 11:06AM

#	FS
a	**1.37**
b	1.37
c	1.37
d	1.37
e	1.37
f	1.38
g	1.38
h	1.38
i	1.38
j	1.38

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
FILL	1	120.0	120.0	50.0	35.0	W1



PCSTABL5M/si FSmin=1.37

Safety Factors Are Calculated By The Modified Bishop Method

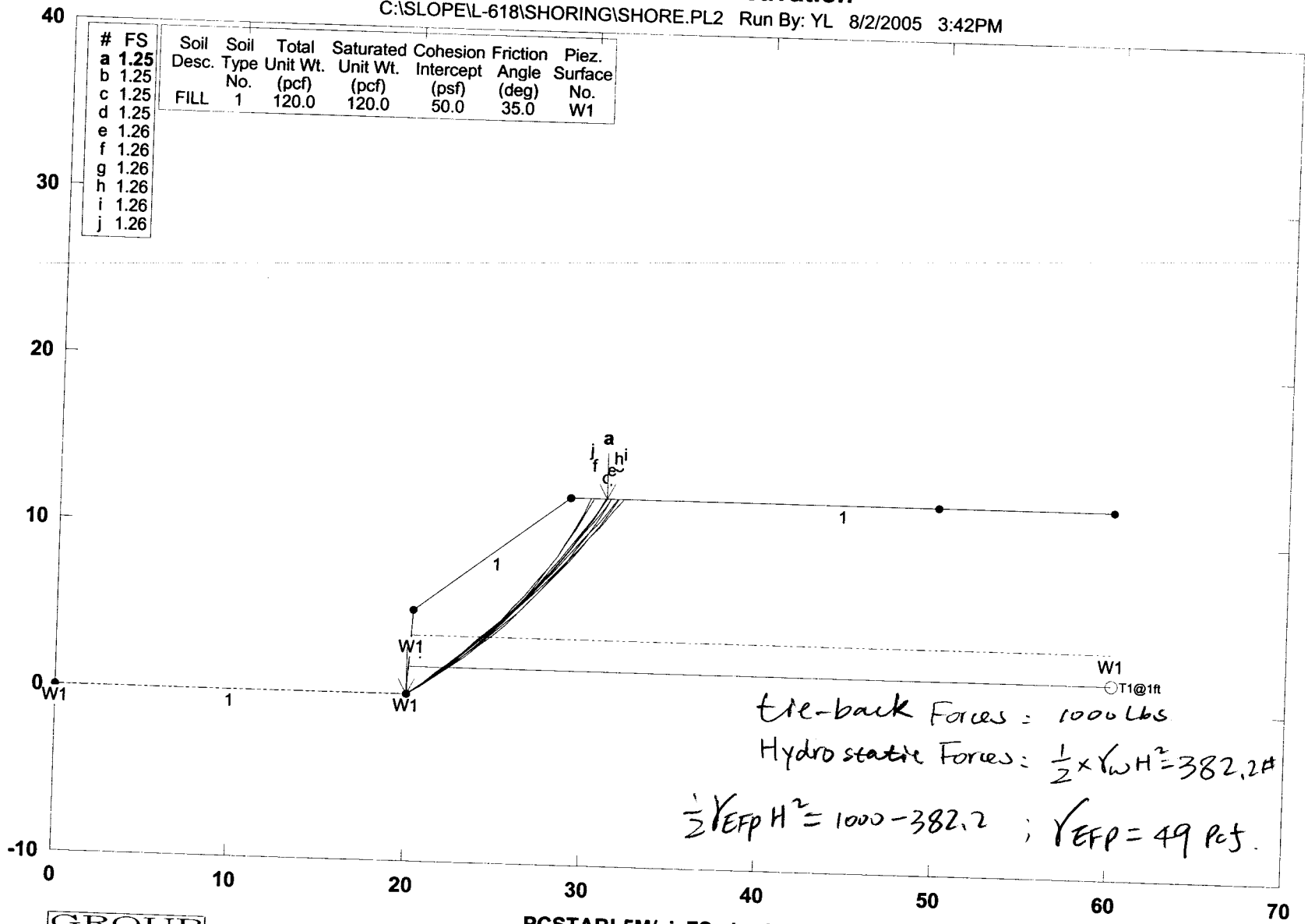
GROUP DELTA CONSULTANTS

L-618 Shored Excavation

C:\SLOPE\L-618\SHORING\SHORE.PL2 Run By: YL 8/2/2005 3:42PM

#	FS
a	**1.25**
b	1.25
c	1.25
d	1.25
e	1.26
f	1.26
g	1.26
h	1.26
i	1.26
j	1.26

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
FILL	1	120.0	120.0	50.0	35.0	W1



tie-back Forces : 1000 Lbs

Hydrostatic Forces : $\frac{1}{2} \times \gamma_w H^2 = 382.2\#$

$\frac{1}{2} \gamma_{EFP} H^2 = 1000 - 382.2$; $\gamma_{EFP} = 49$ pcf.

GROUP DELTA CONSULTANTS

PCSTABL5M/si FSmin=1.25

Safety Factors Are Calculated By The Modified Bishop Method

**** PCSTABL5M ****
by
Purdue University
--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date: 8/2/2005
Time of Run: 3:42PM
Run By: YL
Input Data Filename: C:shore.dat
Output Filename: C:shore.OUT
Unit: ENGLISH
Plotted Output Filename: C:shore.PLT
PROBLEM DESCRIPTION L-618 Shored Excavation
BOUNDARY COORDINATES
Note: User origin value specified.
Add 0.00 to X-values and -10.00 to Y-values listed.

4 Top Boundaries
4 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	10.00	20.00	10.00	1
2	20.00	10.00	20.30	15.00	1
3	20.30	15.00	29.05	22.00	1
4	29.05	22.00	60.00	22.00	1

ISOTROPIC SOIL PARAMETERS
1 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	50.0	35.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED
Unit Weight of Water = 62.40
Piezometric Surface No. 1 Specified by 4 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	.00	10.00
2	20.00	10.00
3	20.21	13.50
4	60.00	13.50

TIEBACK LOAD(S)
1 Tieback Load(s) Specified

Tieback No.	X-Pos (ft)	Y-Pos (ft)	Load (lbs)	Spacing (ft)	Inclination (deg)	Length (ft)
1	20.10	11.67	1000.0	1.0	.00	40.0

NOTE - An Equivalent Line Load Is Calculated For Each Row Of Tiebacks
Assuming A Uniform Distribution Of Load Horizontally Between
Individual Tiebacks.
A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
500 Trial Surfaces Have Been Generated.
500 Surfaces Initiate From Each Of 1 Points Equally Spaced
Along The Ground Surface Between X = 20.00 ft.
and X = 20.00 ft.
Each Surface Terminates Between X = 29.05 ft.
and X = 50.00 ft.
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = .00 ft.
1.00 ft. Line Segments Define Each Trial Failure Surface.
Restrictions Have Been Imposed Upon The Angle Of Initiation.
The Angle Has Been Restricted Between The Angles Of -30.0
And 65.0 deg.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Examined. They Are Ordered - Most Critical
First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	20.00	10.01
2	20.82	10.59
3	21.61	11.19
4	22.40	11.81
5	23.16	12.45
6	23.91	13.12
7	24.64	13.80
8	25.35	14.50
9	26.05	15.22
10	26.72	15.96
11	27.37	16.72
12	28.01	17.49
13	28.62	18.28
14	29.21	19.09
15	29.78	19.91
16	30.33	20.75
17	30.85	21.60
18	31.08	22.00

$\alpha = \arctan \frac{22-10.01}{31.08-20} = 47.25°$

Circle Center At X = -1.2 ; Y = 40.7 and Radius, 37.3

*** 1.253 ***

Individual data on the 21 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	.2	42.0	.0	13.5	.2	-.1	.0	.0	.0
2	.1	43.9	.0	22.8	2.6	-1.4	.0	.0	.0
3	.5	297.0	.0	122.2	58.7	-16.3	.0	.0	.0
4	.8	464.6	.0	163.0	217.3	71.2	.0	.0	.0
5	.8	457.1	.0	124.8	135.9	143.3	.0	.0	.0
6	.8	446.0	.0	85.3	69.0	118.8	.0	.0	.0
7	.7	431.6	.0	44.6	39.8	91.5	.0	.0	.0
8	.4	233.4	.0	6.7	16.1	42.4	.0	.0	.0
9	.3	180.7	.0	.0	10.1	29.9	.0	.0	.0
10	.7	393.7	.0	.0	18.7	58.7	.0	.0	.0
11	.7	370.8	.0	.0	14.4	49.0	.0	.0	.0
12	.7	345.5	.0	.0	11.7	41.8	.0	.0	.0
13	.7	318.2	.0	.0	9.9	36.3	.0	.0	.0
14	.6	289.2	.0	.0	8.6	31.9	.0	.0	.0
15	.6	258.7	.0	.0	7.7	28.3	.0	.0	.0
16	.4	167.8	.0	.0	5.2	18.8	.0	.0	.0
17	.2	58.1	.0	.0	1.8	6.7	.0	.0	.0
18	.6	170.5	.0	.0	6.4	22.9	.0	.0	.0
19	.5	109.4	.0	.0	5.9	20.9	.0	.0	.0
20	.5	51.8	.0	.0	5.5	19.1	.0	.0	.0
21	.2	5.5	.0	.0	2.5	8.2	.0	.0	.0

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	20.00	10.01
2	20.80	10.60
3	21.59	11.22
4	22.37	11.85
5	23.13	12.50
6	23.87	13.17
7	24.59	13.86
8	25.30	14.56
9	26.00	15.29
10	26.67	16.02
11	27.33	16.78
12	27.96	17.55
13	28.58	18.33
14	29.18	19.13
15	29.76	19.95

16	30.32	20.78
17	30.87	21.62
18	31.10	22.00

Circle Center At X = -4.2 ; Y = 43.5 and Radius, 41.3
*** 1.254 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	20.00	10.01
2	20.83	10.57
3	21.64	11.16
4	22.43	11.77
5	23.20	12.41
6	23.95	13.06
7	24.69	13.74
8	25.40	14.44
9	26.10	15.16
10	26.77	15.90
11	27.42	16.66
12	28.04	17.44
13	28.65	18.24
14	29.23	19.05
15	29.78	19.89
16	30.31	20.73
17	30.82	21.60
18	31.04	22.00

Circle Center At X = 1.3 ; Y = 38.3 and Radius, 33.9
*** 1.254 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	20.00	10.01
2	20.80	10.61
3	21.58	11.23
4	22.36	11.86
5	23.12	12.52
6	23.86	13.18
7	24.59	13.87
8	25.30	14.57
9	26.00	15.28
10	26.69	16.01
11	27.35	16.76
12	28.00	17.52
13	28.64	18.29
14	29.26	19.08
15	29.86	19.88
16	30.44	20.69
17	31.01	21.51
18	31.33	22.00

Circle Center At X = -7.4 ; Y = 47.2 and Radius, 46.2
*** 1.255 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	20.00	10.01
2	20.84	10.55
3	21.67	11.11
4	22.47	11.70
5	23.26	12.32
6	24.03	12.96
7	24.78	13.62
8	25.51	14.31
9	26.21	15.02
10	26.90	15.75
11	27.56	16.50
12	28.20	17.27
13	28.81	18.05

14	29.40	18.86
15	29.96	19.69
16	30.50	20.53
17	31.01	21.39
18	31.35	22.00

Circle Center At X = 3.0 ; Y = 37.5 and Radius, 32.4
*** 1.257 ***
Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	20.00	10.01
2	20.82	10.59
3	21.61	11.19
4	22.39	11.82
5	23.14	12.48
6	23.88	13.16
7	24.59	13.86
8	25.28	14.58
9	25.95	15.33
10	26.59	16.09
11	27.21	16.88
12	27.80	17.68
13	28.37	18.51
14	28.91	19.35
15	29.42	20.21
16	29.91	21.08
17	30.37	21.97
18	30.38	22.00

Circle Center At X = 2.1 ; Y = 36.0 and Radius, 31.5
*** 1.259 ***
Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	20.00	10.01
2	20.83	10.57
3	21.64	11.15
4	22.44	11.76
5	23.22	12.38
6	23.99	13.02
7	24.74	13.68
8	25.47	14.36
9	26.19	15.06
10	26.89	15.77
11	27.58	16.50
12	28.24	17.25
13	28.89	18.01
14	29.51	18.79
15	30.12	19.58
16	30.71	20.39
17	31.28	21.21
18	31.80	22.00

Circle Center At X = -2.6 ; Y = 44.0 and Radius, 40.8
*** 1.259 ***
Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	20.00	10.01
2	20.79	10.62
3	21.57	11.24
4	22.34	11.88
5	23.10	12.53
6	23.85	13.20
7	24.58	13.88
8	25.31	14.57
9	26.02	15.27
10	26.71	15.99
11	27.40	16.72

12	28.07	17.46
13	28.73	18.21
14	29.37	18.98
15	30.00	19.75
16	30.62	20.54
17	31.22	21.34
18	31.70	22.00

Circle Center At X = -13.6 ; Y = 54.5 and Radius, 55.7
*** 1.260 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	20.00	10.01
2	20.80	10.61
3	21.59	11.23
4	22.36	11.85
5	23.13	12.50
6	23.89	13.15
7	24.63	13.82
8	25.36	14.50
9	26.09	15.19
10	26.79	15.90
11	27.49	16.62
12	28.18	17.34
13	28.85	18.08
14	29.51	18.84
15	30.15	19.60
16	30.79	20.37
17	31.41	21.16
18	32.01	21.95
19	32.05	22.00

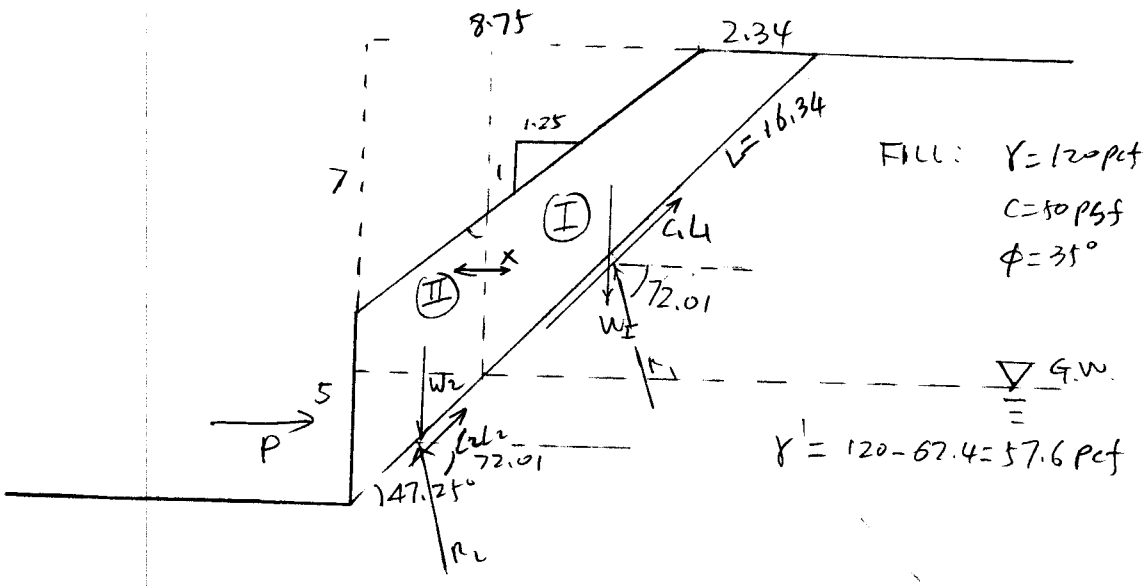
Circle Center At X = -14.8 ; Y = 57.0 and Radius, 58.5
*** 1.264 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	20.00	10.01
2	20.84	10.56
3	21.65	11.14
4	22.44	11.75
5	23.21	12.39
6	23.95	13.06
7	24.67	13.75
8	25.36	14.48
9	26.02	15.23
10	26.66	16.00
11	27.26	16.80
12	27.83	17.62
13	28.37	18.46
14	28.88	19.32
15	29.36	20.20
16	29.80	21.10
17	30.20	22.00

Circle Center At X = 6.0 ; Y = 32.3 and Radius, 26.3
*** 1.265 ***

Vector Calculation



$C_{mob} = \frac{50}{1.25} = 40$ psf ; $\phi_{mob} = \arctan \frac{\tan 35°}{1.25} = 29.26°$

$W_I = \left[\frac{1}{2} \times (8.5 \times 7.19) - \frac{1}{2}(5.25 \times 4.2)\right] \times 120 = 2548$ #

$C_1L_1 = 40 \times (16.34 - 5.15) = 447.6$ #

Vertical $W_I - C_1L_1 \times \sin 47.25 = R \times \sin 72.01 \Rightarrow R = 2333.6$ #

Horizontal $X + C_1L_1 \cos 47.25 = R \cdot \cos 72.01 \Rightarrow X = 416.7$ #

$W_{II} = \left(\frac{1}{2} \times 3.5 \times 3.24 \times 57.6\right) + \left[3.24 \times 1.5 + \frac{1}{2} \times 3.24 \times 2.59\right] \times 120 = 1413.3$ #

$C_2L_2 = 50 \times 5.15 = 257.5$ #

GROUP DELTA CONSULTANTS

PROJECT NAME _____ DRAWN BY _____

CHECKED BY _____

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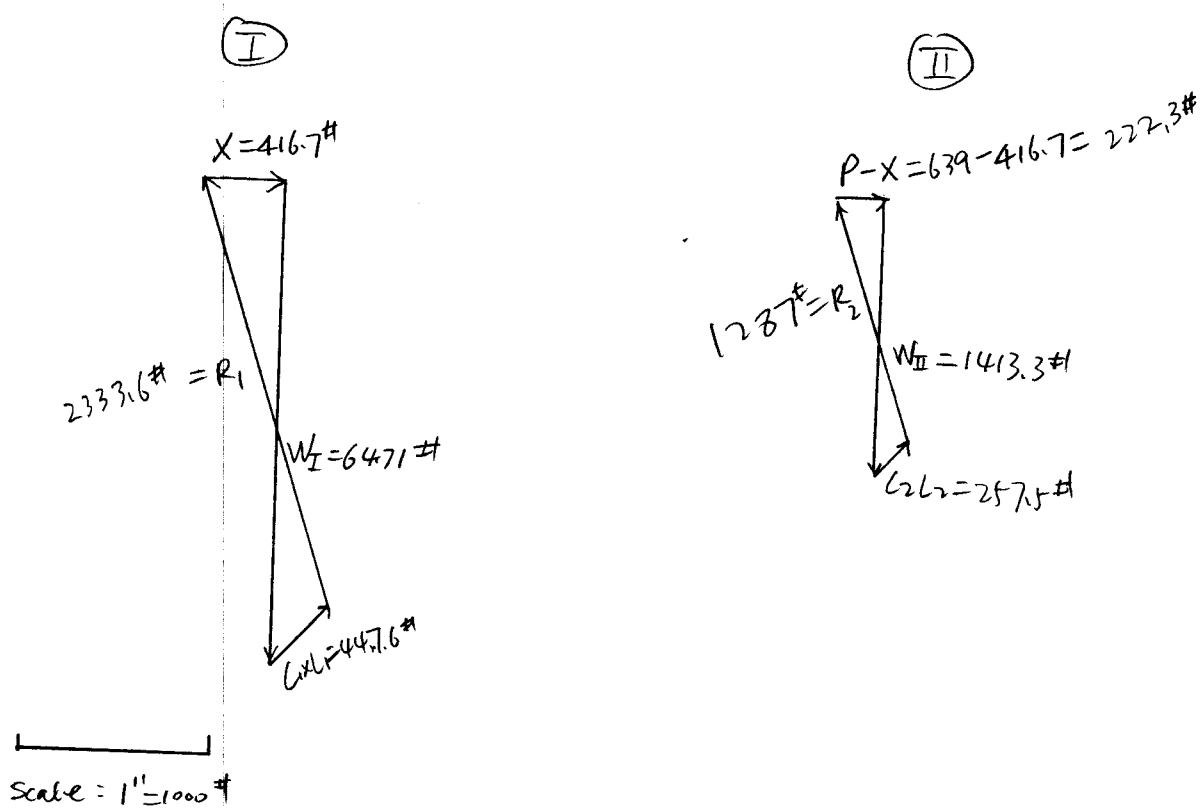
$V: \quad W_{II} - C_2L_2 \times \sin(47.25^\circ) = R_2 \times \sin 72.01^\circ \Rightarrow R_2 = 1287\ \#$

$H: \quad P - X + C_2L_2 \cos(47.25^\circ) - R_2 \cdot \cos 72.01^\circ = 0 \Rightarrow P = 639\ \#$

$$\frac{1}{2}\gamma_{EFP} H^2 = 639\ \#$$

$$\gamma_{EFP} = \frac{639 \times 2}{25} = 51\ pcf$$



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PROJECT NAME _____ DRAWN BY _____

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PROJECT NUMBER _____ DATE _____ PAGE _____ OF _____

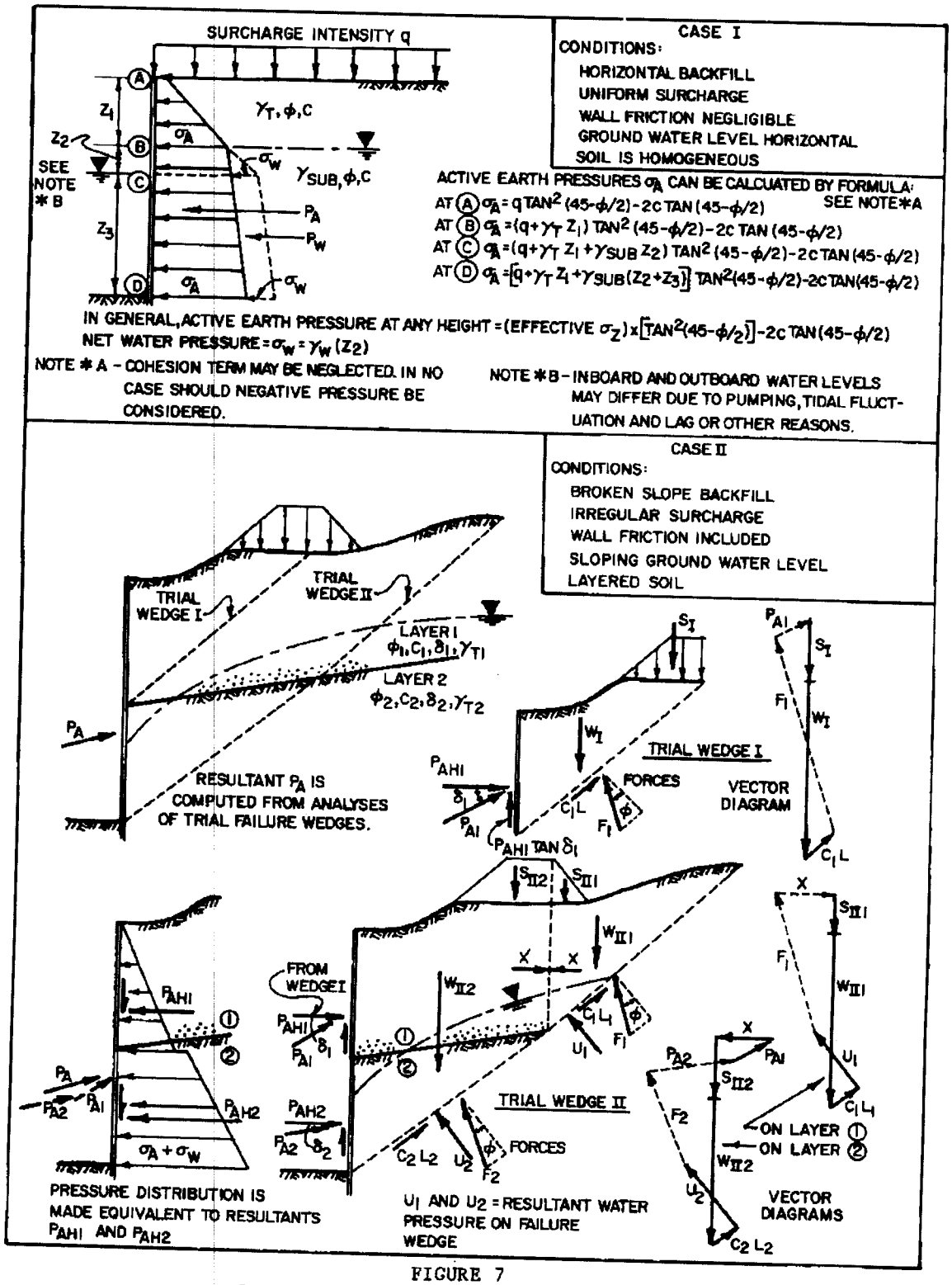


FIGURE 7
Computation of General Active Pressures

APPENDIX G

Previous Geotechnical Investigation

GROUP DELTA CONSULTANTS

APPENDIX G1
SUBSURFACE EXPLORATION BY BAGAHI ENGINEERING

DEFINITION OF TERMS

Primary Divisions			Symbols	Secondary Divisions
COARSE-GRAINED SOILS More Than Half of Material Is Larger Than No. 200 Sieve Size	GRAVELS More Than Half of Coarse Fraction Is Larger Than No. 4 Sieve	CLEAN GRAVELS (Less Than 5% Fines)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, nonplastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS More Than Half of Coarse Fraction Is Smaller Than No. 4 Sieve	CLEAN SANDS (Less Than 5% Fines)	SW	Well-graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, nonplastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE-GRAINED SOILS More Than Half of Material Is Smaller Than No. 200 Sieve Size	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

GRAIN SIZES

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

200 40 10 4 3/4" 3" 12"

U.S. STANDARD SERIES SIEVE — CLEAR SQUARE SIEVE OPENINGS

RELATIVE DENSITY		
Cohesionless Sands and Silts	Blows/ft *	Blows/ft**
Very loose	0–4	0–30
Loose	4–10	30–80
Medium dense	10–30	80–200
Dense	30–50	200–400
Very dense	Over 50	Over 400

CONSISTENCY		
Cohesive Soils	Blows/ft*	Blows/ft**
Very soft	0–4	0–4
soft	2–4	4–11
Firm	4–8	11–50
Stiff	8–16	50–110
Very stiff	16–32	110–220
Hard	Over 32	Over 220

* Blows/foot for a 140-pound hammer falling 30 inches to drive a 2-inch O.D., 1-3/8-inch I.D. Split Spoon sampler (Standard Penetration Test).

** Blows/foot for a 36-pound hammer falling 24 inches to drive a 3.25 O.D., 2.41 I.D. sampler (Hand Sampling). Blow count convergence to standard penetration test was done in accordance with Fig. 1.24 of *Foundation Engineering Handbook* by H.Y. Fang, Van Nostrand Reinhold, 1991.

Key to Sample Types: R=Ring Samples, S=Split Spoon, B=Bulk

KEY TO LOGS

JOB NO.:	DATE:	FIGURE: B-2

DATE OBSERVED: 1/17/2000

LOG OF BORING NO. B-1

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 14'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb. SPT
400 lb RING

FALLING: 30 inches
18 inches

This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.

Depth (ft.)	Soil Type	Sample Type		Blows/ Foot	Field Moist. (%)	Field Density (pcf)	
		B			8.5		4"± AC
2-							
4-			S	13	21.7		@5' Light brown medium to fine SAND, medium dense, trace of coarse sand and shell fragments, moist
6-							
8-							
10-			R	14	21.2	102.8	
12-							
14-							
16-			S	2	59		@15' Dark gray sandy SILT, soft, trace of shells with a rotten odor, trace of oil stain, wet
18-							
20-			R	2	36.3	86.1	@20' Dark gray fine silty SAND, loose, wet
22-							
24-							
26-			S	55	28.8		
28-							
30-			R	30	27.5	97.6	@30' Dark Gray silty fine SAND, wet.
32-							
34-			S	6	20.8		@34.5' Dark gray fine silty SAND, loose, wet @35' becoming fine Sandy SILT.
36-							
38-							
40-			R	12	23.4	99.9	@40' light greenish gray silty fine SAND @42'-45' trace of fine gravel
42-							
44-							

JOB NO.: 99m-200-00

FIGURE: B-3

BAGAHI ENGINEERING

DATE OBSERVED: 1/17/2000

LOG OF BORING NO. B-1

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 14'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb SPT
400 lb RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-						
		S	45	11.9		@45' Light gray fine to medium SAND, dense, wet
46-						
48-						
50-		R	32	5.9	137.9	@50' Gray sandy fine GRAVEL (up to 3/4"±dia), medium dense to dense, wet
52-						
54-						@53'End of gravel, changing to light greenish gray to dark gray fine SAND, dense, wet
		S	44	22.0		
56-						
58-						
60-		R	27	27.6	91.6	@60' Light greenish gray fine SAND, medium dense, wet
62-						
64-						@60' end of boring Water @13.5' @ end of drilling
66-						
68-						
70-						
72-						
74-						
76-						
78-						
80-						
82-						
84-						
86-						
88-						

JOB NO.: 99m-200-00

FIGURE: B-4

BAGAHI ENGINEERING

DATE OBSERVED: 1/17/2000

LOG OF BORING NO. B-2

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 10'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb. SPT
400 lb RING

FALLING: 30 inches
18 inches

This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.

Depth (ft.)	Soil Type	Sample Type		Blows/ Foot	Field Moist. (%)	Field Density (pcf)	
		B			3.2		6" of AC
2-							
4-			S	13	14.7		@5' Light brown fine SAND, trace shell fragments, medium dense, moist
6-							
8-							
10-			R	1	20.9	102.6	@10' Light brown clayey silty fine SAND, loose, very moist
12-							
14-			S	8	29.3		
16-							
18-							
20-			R	20	18.0	110.5	
22-							@20' Light gray medium to fine SAND, medium dense, wet
24-			S	2	55.6		@22' Dark gray fine silty SAND, loose, wet
26-							@25' Gray clayey SILT, soft, wet
28-							
30-			R	2	20.8	103.6	
32-							
34-			S	4	30.6		
36-							@35' Dark gray SILT with some sand, soft, wet
38-							
40-			R	12	11.8	127.2	@39' End of dark gray SILT
42-							@41' Light brown fine to medium SAND, dense, wet
44-							

JOB NO.: 99m-200-00

FIGURE: B-5

BAGAHI ENGINEERING

DATE OBSERVED: 1/17/2000

LOG OF BORING NO. B-2

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 10'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb SPT
400 lb RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-						
		S	57	16.1		@45' Light brown medium coarse SAND, dense, trace of fine gravel, wet
46-						
48-						@48' Change of color to greenish gray and golden brown fine SAND, medium dense, wet
50-		R	15	25.4	95.7	
52-						
54-						
		S	30	26.7		@55' Greenish gray fine SAND, medium dense, wet
56-						
58-						
60-		R	20	26.9	94.2	
						@60' End of boring @12' Ground water @ end of drilling
62-						
64-						
66-						
68-						
70-						
72-						
74-						
76-						
78-						
80-						
82-						
84-						
86-						
88-						

JOB NO.: 99m-200-00

FIGURE: B-6

BAGAHI ENGINEERING

DATE OBSERVED: 1/17/2000

LOG OF BORING NO. B-3

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 12.5'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb. SPT
400 lb sampler RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type		Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
		B			20.5		4"± AC
2-							@1' Light brown fine SAND, medium dense, moist
4-			S	14	18.9		
6-							@5' Light brown silty fine SAND, medium dense, moist to very moist
8-							
10-			R	11	25.3	84.3	
12-							
14-			S	3	57.2		@13' Dark Gray fine sandy SILT, soft, trace of shell fragments, wet
16-							
18-							
20-			R	11	22.2	98.7	@20' Light gray fine SAND,medium dense, trace of silt and shell fragments, wet
22-							
24-			S	10	29.3		
26-							@27' Dark gray fine sandy SILT, soft, wet
28-							
30-			R	3	37.0	81.2	@31' Light brown fine to medium SAND, loose, wet
32-							
34-			S	8	24.3		@34' Dark gray clayey SILT, soft, wet
36-							
38-							
40-			R	7	33.4	90.0	
42-							
44-							

JOB NO.: 99m-200-00

FIGURE: B-7

BAGAHI ENGINEERING

DATE OBSERVED: 1/17/2000

LOG OF BORING NO. B-3

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5"Rotary Wash Auger

GROUND EL.: Elev. 12.5'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb SPT
400 lb RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-						
		S	15	19.6		@45' Greenish gray silty fine SAND, medium dense, wet
46-						@47.5' Light brown gravelly medium to coarse SAND, medium dense to dense, wet
48-						
50-		R	60	6.9	137.4	
52-						
54-						@54' End of gravelly material, greenish gray silty fine SAND, medium dense to dense, wet
		S	55	26.3		
56-						
58-						
60-		R	30	30.8	93.3	
62-						@60' End of drilling
						@13' Ground water @ end of drilling
64-						
66-						Installed 60 feet of 2-inch dia. PVC monitoring well, 30' slotted, 30' soild
68-						
70-						
72-						
74-						
76-						
78-						
80-						
82-						
84-						
86-						
88-						

JOB NO.: 99m-200-00

FIGURE: B-8

BAGAHI ENGINEERING

DATE OBSERVED: 1/18/2000

LOG OF BORING NO. B-4

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING:5" Rotary Wash Auger

GROUND EL.: Elev. 9.5'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb. SPT
400 lb sampler RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type		Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
		B			12.6		4"± AC
2-							
4-			S	23	25.2		@5' Light gray silty SAND, medium dense, trace of shell fragments, moist to very moist
6-							
8-							
10-			R	2	69.4	56.2	@10' Grayish dark gray fine sandy SILT, soft, trace of organic material, wet
12-							
14-			S	33	32.4		@15' Dark gray fine silty SAND, dense, trace of shell fragments, wet
16-							
18-							
20-			R	4	31.9	87.9	@20' Trace of gravel
22-							
24-			S	2	57.1		@25' Light gray SILT with trace of sand, soft, wet
26-							
28-							
30-			R	2	28.0	93.8	
32-							
34-			S	7	18.1		@35' Dark gray silty fine to medium SAND, loose, wet
36-							
38-							@37.5' Light brown medium to coarse SAND, medium dense, trace gravel, wet
40-			R	30	16.5	109.9	
42-							
44-							

JOB NO.: 99m-200-00

FIGURE: B-9

SHEET 1 OF 2

BAGAHI ENGINEERING

DATE OBSERVED: 1/18/2000

LOG OF BORING NO. B-4

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 9.5'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb SPT, 400 lb RING

FALLING: 30 inches, 18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-						
		S	21	38.7		@45' End of gravel
46-						Light greenish gray fine silty SAND to sandy SILT, medium dense to dense, trace organics, wet
48-						
50-		R	32			No recovery @50'
52-						
54-						
		S	66	25.8		@55' Gray to greenish fine SAND, dense, trace silt
56-						
58-						
60-		R	55	23.4	97.1	
62-						End of boring @60' Groundwater @5.5' @ end of drilling
64-						
66-						Installed 20' of 2-inch dia PVC monitoring well, 10' solid, 10' slotted.
68-						
70-						
72-						
74-						
76-						
78-						
80-						
82-						
84-						
86-						
88-						

JOB NO.: 99m-200-00

FIGURE: B-10

BAGAHI ENGINEERING

DATE OBSERVED: 1/19/2000

LOG OF BORING NO. B-5

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 7.5'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb. SPT
400 lb sampler RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
						LAWN
2-						
4-		S	2	40.8		@5' Dark gray clayey fine SAND to sandy SILT, loose, trace of organic matter & trace of sea shell fragments
6-						
8-						
10-		R	1	37.3	79.6	@10' Changing to dark gray silty fine SAND, loose, very moist
12-						
14-		S	4	34.1		
16-						@15' same, abundant shell fragments, wet
18-						
20-		R	5	31.3	89.9	@20' becoming sandy SILT, shell fragments, soft, wet
22-						
24-		S	1/18"	25.2		
26-						
28-						
30-		R	16	13.7	122.3	@29' Light gray sandy fine GRAVEL to gravelly coarse SAND, medium dense, trace of shell fragments, wet
32-						
34-		S	18	16.8		@35' becoming more gravelly
36-						
38-						
40-		R	50	8.3		@40' Light gray fine to coarse GRAVEL, some sea shell fragments, dense, trace medium SAND, wet
42-						
44-						

JOB NO.: 99m-200-00

FIGURE: B-11

BAGAHI ENGINEERING

DATE OBSERVED: 1/19/2000

LOG OF BORING NO. B-5

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 7.5'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb SPT
400 lb RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-						@45' Silty sandy fine GRAVEL, dense, no sea shell fragments, wet
		S	55	14.6		
46-						
48-						@49' Greenish gray silty fine SAND, medium dense, wet
50-		R	40	24.2	101.2	
52-						
54-						
		S	36			
56-						
58-						
60-		R		33.3	89.2	
62-						
64-						@60' End of drilling @10' groundwater at end of drilling
66-						
68-						Installed 20' of 2-inch PVC monitoring well, 10' solid and 10' slotted.
70-						
72-						
74-						
76-						
78-						
80-						
82-						
84-						
86-						
88-						

JOB NO.: 99m-200-00

FIGURE: B-12

BAGAHI ENGINEERING

DATE OBSERVED: 1/19/2000

LOG OF BORING NO. B-6

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 10.5'

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb. SPT
400 lb sampler RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
						4"± AC
2-						
4-		S	15	33.3		@5' Light gray silty fine SAND, medium dense, moist
6-						
8-						
10-		R	1	26.9	80.1	@10' Dark gray clayey silty fine SAND to sandy SILT, loose,wet
12-						
14-		S	13	26.6		@15' Light brown fine silty SAND, medium dense, trace of shell fragments, wet
16-						
18-						
20-		R	10	36.8	88.6	@20' Light gray fine silty SAND, medium dense, wet
22-						
24-		S	PUSH	39.3		@25' Dark gray SILT with trace of sand, soft, wet
26-						
28-						@30' same
30-		R	5	20.5	104.4	
32-						
34-		S	8	23.7		@35' Light gray to gray silty SAND to sandy SILT, loose to medium dense, wet
36-						@38' Light brown fine to coarse GRAVEL, some coarse to medium SAND, medium dense, wet
38-						
40-		R	20	14.8		
42-						
44-						

JOB NO.: 99m-200-00

FIGURE: B-13

BAGAHI ENGINEERING

DATE OBSERVED: 1/19/2000

LOG OF BORING NO. B-6

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 10.5'

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb SPT
400 lb RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type		Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-			S	29	34.5		@44' End of gravel layer @45' Light brown fine silty SAND, medium dense, wet
46-							
48-							
50-							
52-							@50' cave-in, end of boring @10' groundwater at the end of boring
54-							
56-							Installed 20' of 2-inch PVC monitoring well, 10' solid and 10' slotted.
58-							
60-							
62-							
64-							
66-							
68-							
70-							
72-							
74-							
76-							
78-							
80-							
82-							
84-							
86-							
88-							

JOB NO.: 99m-200-00

FIGURE: B-14

BAGAHI ENGINEERING

DATE OBSERVED: 1/19/2000

LOG OF BORING NO. B-7

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 7.5'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb. SPT
400 lb sampler RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
						LAWN
2-						
4-		S	5	23.7		@5' Light brown fine silty SAND, loose, trace of gravel, shell fragments, moist
6-						
8-						
10-		R	5	22.2	99.6	@10' Light gray fine SAND, loose, trace of gravel and some shell fragments, moist to very moist
12-						
14-		S	6	22.0		@15' same, with traces of coarse gravel, wet
16-						
18-						
20-		R	14	23.9	100.5	
22-						
24-		S	5	18.9		@24' Light gray fine silty SAND, loose, wet @25' Dark gray sandy fine GRAVEL to gravelly medium to coarse SAND, medium dense, wet
26-						
28-						
30-		R	30	12.1	126.4	
32-						
34-		S	8	16.0		@34' Light to dark brown fine to medium coarse silty SAND, medium dense, wet
36-						
38-						
40-		R	18	18.1	113.6	@40' Light brown to greenish gray fine to medium SAND, medium dense, wet
42-						
44-						

JOB NO.: 99m-200-00

FIGURE: B-15

BAGAHI ENGINEERING

DATE OBSERVED: 1/19/2000 **LOG OF BORING NO. B-7** LOCATION: See Plot Plan

LOGGED BY: SG METHOD OF DRILLING: 5" Rotary Wash Auger GROUND EL.: Elev. 7.5'±

DRILLING CONTRACTOR: A & W HAMMER: 140 lb SPT FALLING: 30 inches
400 lb RING 18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-						
		S	60	18.5		@45' Greenish gray medium coarse SAND, very dense, trace of fine gravel, wet
46-						
48-						
50-		R	30	25.7	97.6	@50' becoming fine SAND
52-						
54-						@54' change of color to light brown, dense, wet
		S	36	24.9		
56-						
58-						
60-		R	30	26.8	95.4	@60' Greenish gray silty fine SAND, medium dense, wet
62-						
64-						@60' End of boring Groundwater @12' @ end of boring
66-						
68-						
70-						
72-						
74-						
76-						
78-						
80-						
82-						
84-						
86-						
88-						

JOB NO.: 99m-200-00 FIGURE: B-16

BAGAHI ENGINEERING

DATE OBSERVED: 2/2/2000

LOG OF BORING NO. B-11

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 13.3'

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb. SPT
400 lb sampler RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type		Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
		B					LAWN
2-							
4-							@ 0-5'Light brown fine SAND, medium dense, moist
6-			S	12	46.0		
8-							
10-			R	6	45.4	86.1	@10' Dark gray fine sandy SILT, loose, many shell fragments, very moist
12-							
14-			S	5	40.5		
16-							
18-							
20-			R	6	26.1	101.3	
22-							
24-			S	38	27.5		@25' Dark gray fine silty SAND, dense, end of shell fragments, wet
26-							
28-							
30-			R	25	26.8	98.2	
32-		B			32.0		@32' Dark greenish gray clayey SILT, trace of fine SAND, some plasticity, soft, wet
34-			S	4	22.8		
36-							
38-							
40-			R	7	29.9	94.1	
42-							@43' Light greenish gray gravelly medium to coarse SAND, dense, wet
44-							

JOB NO.: 99m-200-00

FIGURE: B-23

BAGAHI ENGINEERING

DATE OBSERVED: 2/2/2000 **LOG OF BORING NO. B-11** LOCATION: See Plot Plan

LOGGED BY: SG METHOD OF DRILLING: 5" Rotary Wash Auger GROUND EL.: Elev. 13.3'

DRILLING CONTRACTOR: A & W HAMMER: 140 lb SPT FALLING: 30 inches
400 lb RING 18 inches

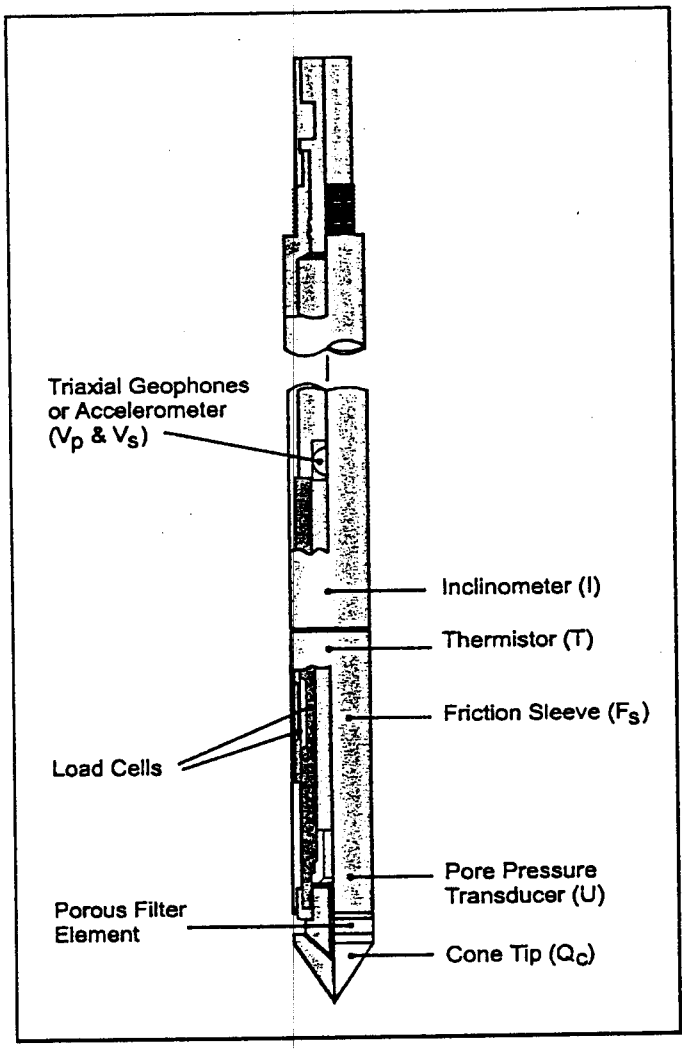
Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-						Light greenish gray gravelly medium to coarse
		S	37	10.7		SAND, dense, wet
46-						
48-						
50-		R	35	14.5	119.2	
52-						
54-						
56-						
58-						
						End of gravelly material @59'
60-		R	45	24.0	102.0	@60' Greenish gray fine silty SAND, dense, wet
62-						
						End of boring @60'
64-						Ground water @12' after drilling
						Cave in @17'
66-						
						Installed 15 feet of 2-inch monitoring well, 5' slotted
68-						and 10' solid.
70-						
72-						
74-						
76-						
78-						
80-						
82-						
84-						
86-						
88-						

JOB NO.: 99m-200-00 FIGURE: B-24

GREGG IN SITU, INC.

Geotechnical and Environmental In Situ Testing Contractors

THE PIEZO CONE PENETROMETER



The electrical piezocone (CPTU) is the premier soil logging tool. The CPTU provides a rapid, reliable and economic means of determining soil stratigraphy, relative density, strength and equilibrium groundwater pressures.

Gregg In Situ offers a choice of 2.5, 5, 10 and 15 ton tip (Qc) capacity cones. Our cones also have variable capacity friction sleeves (Fs) and pore pressure (U). The pore pressure can be measured at one of 2 locations, either on the face of the cone tip or behind the cone tip. Pore pressure dissipation data is recorded automatically.

All data is displayed in real time at the ground surface, facilitating the on site decision making process. Field data reduction, plotting and CPT interpretation can be carried out upon request.

Geotechnical and Environmental In Situ Testing Contractors

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Gregg In Situ CPT Interpretations as of January 7, 1999 (Release 1.00.19)

Gregg In Situ's interpretation routine should be considered a calculator of current published CPT correlations and is subject to change to reflect the current state of practice. The interpreted values are not considered valid for all soil types. The interpretations are presented only as a guide for geotechnical use and should be carefully scrutinized for consideration in any geotechnical design. Reference to current literature is strongly recommended.

The CPT interpretations are based on values of tip, sleeve friction and pore pressure averaged over a user specified interval (typically 0.25m). Note that Qt is the recorded tip value, Qc, corrected for pore pressure effects. Since all Gregg In Situ cones have equal end area friction sleeves, pore pressure corrections to sleeve friction, Fs, are not required.

The tip correction is: $Qt = Qc + (1-a) \bullet Ud$

where: *Qt* is the corrected tip load
Qc is the recorded tip load
Ud is the recorded dynamic pore pressure
a is the Net Area Ratio for the cone (typically 0.85 for Gregg In Situ cones)

Effective vertical overburden stresses are calculated based on a hydrostatic distribution of equilibrium pore pressures below the water table or from a user defined equilibrium pore pressure profile (this can be obtained from CPT dissipation tests). The stress calculations use unit weights assigned to the Soil Behavior Type zones or from a user defined unit weight profile.

Details regarding the interpretation methods for all of the interpreted parameters is given in table 1. The appropriate references referred to in table 1 are listed in table 2.

The estimated Soil Behavior Type is based on the charts developed by Robertson and Campanella shown in figure 1.

Table 1 CPT Interpretation Methods

Interpreted Parameter	Description	Equation	Ref
Depth	mid layer depth		
AvgQt	Averaged corrected tip (Qt)	$AvgQt = \frac{1}{n}\sum_{i=1}^{n} Qt_i$	
AvgFs	Averaged sleeve friction (Fs)	$AvgFs = \frac{1}{n}\sum_{i=1}^{n} Fs_i$	
AvgRf	Averaged friction ratio (Rf)	$AvgRf = 100\% \bullet \frac{AvgFs}{AvgQt}$	
AvgUd	Averaged dynamic pore pressure (Ud)	$AvgUd = \frac{1}{n}\sum_{i=1}^{n} Ud_i$	
SBT	Soil Behavior Type as defined by Robertson and Campanella		1

CPT Interpretations

U.Wt.	Unit Weight of soil determined from: 1) uniform value or 2) value assigned to each SBT zone 3) user supplied unit weight profile		
TStress	Total vertical overburden stress at mid layer depth	$TStress = \sum_{i=1}^{n} \gamma_i h_i$ where γ_i is layer unit weight h_i is layer thickness	
EStress	Effective vertical overburden stress at mid layer depth	$EStress = TStress - Ueq$	
Ueq	Equilibrium pore pressure determined from: 1) hydrostatic from water table depth 2) user supplied profile		
Cn	SPT N_{60} overburden correction factor	$Cn=(\sigma_v')^{-0.5}$ where σ_v' is in tsf $0.5 < C_n < 2.0$	
N_{60}	SPT N value at 60% energy calculated from Qt/N ratios assigned to each SBT zone		3
$(N1)_{60}$	SPT N_{60} value corrected for overburden pressure	$N1_{60} = Cn \bullet N_{60}$	3
$\Delta(N1)_{60}$	Equivalent Clean Sand Correction to $(N1)_{60}$	$\Delta(N1)_{60} = \frac{K_{SPT}}{1-K_{SPT}} \bullet (N1)_{60}$ Where: K_{SPT} is defined as: 0.0 for FC < 5% 0.0167 • (FC - 5) for 5% < FC < 35% 0.5 for FC > 35% FC - Fines Content in %	7
$(N1)_{60cs}$	Equivalent Clean Sand $(N1)_{60}$	$(N1)_{60cs} = (N1)_{60} + \Delta(N1)_{60}$	7
Su	Undrained shear strength - Nkt is use selectable	$Su = \frac{Qt - \sigma_v}{N_{kt}}$	2
k	Coefficient of permeability (assigned to each SBT zone)		6
Bq	Pore pressure parameter	$Bq = \frac{\Delta u}{Qt - \sigma_v}$	2
Qtn	Normalized Qt for Soil Behavior Type classification as defined by Robertson, 1990	$Qtn = \frac{Qt - \sigma_v}{\sigma'_v}$	4
Rfn	Normalized Rf for Soil Behavior Type classification as defined by Robertson, 1990	$Rfn = 100\% \bullet \frac{f_s}{Qt - \sigma_v}$	4
SBTn	Normalized Soil Behavior Type (slightly modified from that published by Robertson, 1990. This version includes all the soil zones of the original non-normalized SBT chart - see figure 1)		4
Qc1	Normalized Qt for seismic analysis	$qc1 = qc \bullet (Pa/\sigma_v')^{0.5}$ where: Pa = atm. pressure	5
Qc1N	Dimensionless Normalized Qt1	qc1N = qc1 / Pa where: Pa = atm. pressure	

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CPT Interpretations

ΔQc1N1	Equivalent clean sand correction	$\Delta qc1N = \frac{K_{CPT}}{1-K_{CPT}} \bullet qc1N$ Where: K_{CPT} is defined as: 0.0 for FC < 5% 0.0267 • (FC - 5) for 5% < FC < 35% 0.5 for FC > 35% FC - Fines Content in %	5
Qc1Ncs	Clean Sand equivalent Qc1N	$qc1Ncs = qc1N + \Delta qc1N$	5
Ic	Soil index for estimating grain characteristics	$Ic = [(3.47 - logQ)^2 + (log\ F + 1.22)^2]^{0.5}$	5
FC	Fines content (%)	$FC=1.75(Ic^{3.25}) - 3.7$ $FC=100$ for $Ic > 3.5$ $FC=0$ for $Ic < 1.26$ $FC = 5\%$ if $1.64 < Ic < 2.6$ AND $Rfn<0.5$	8
PHI	Friction Angle	Campanella and Robertson Durunoglu and Mitchel Janbu	1
Dr	Relative Density	Ticino Sand Hokksund Sand Schmertmann 1976 Jamiolkowski - All Sands	1
OCR	Over Consolidation Ratio		1
State Parameter			9
CRR	Cyclic Resistance Ratio		7

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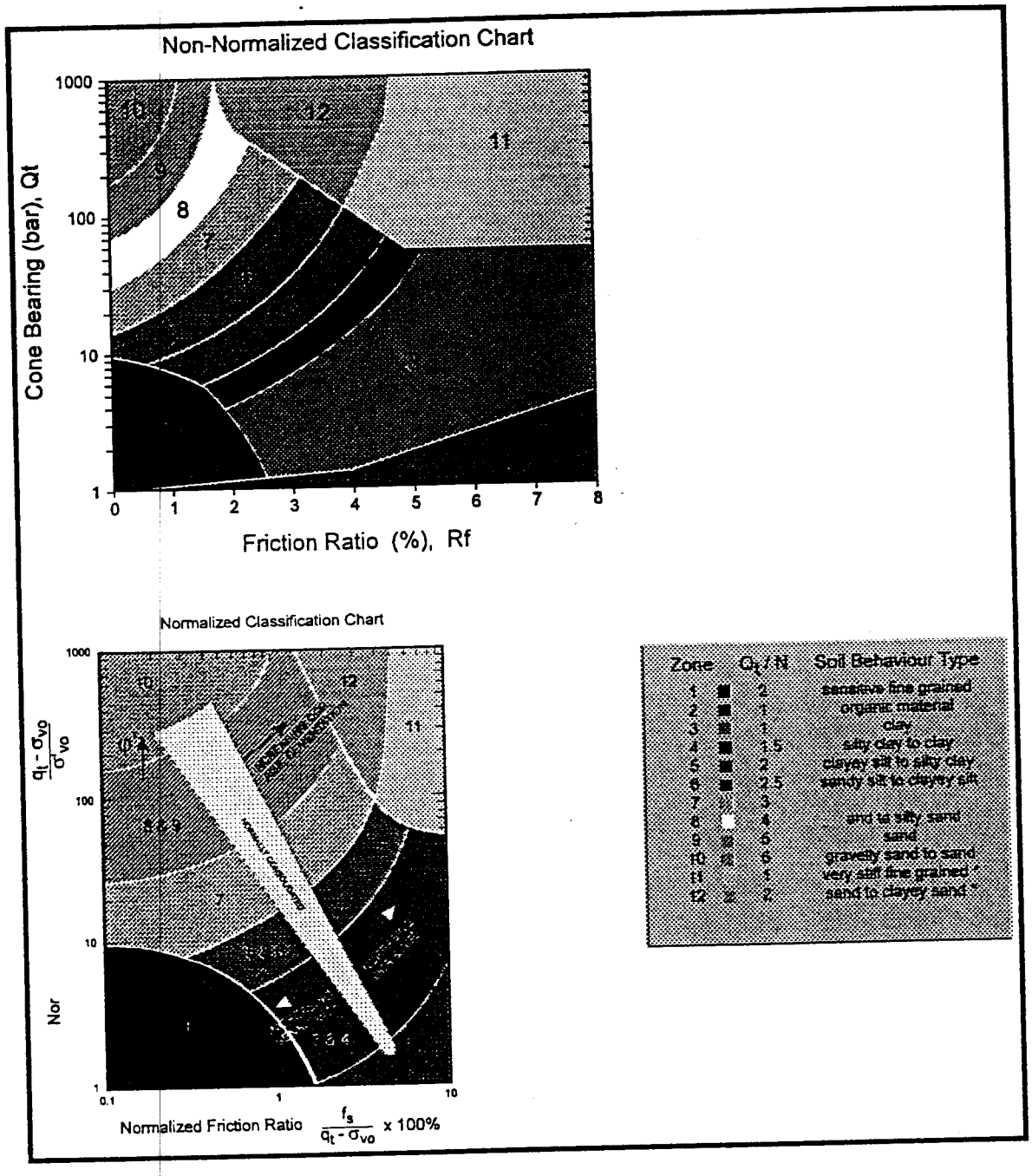

Figure 1 Non-Normalized and Normalized Soil Behavior Type Classification Charts

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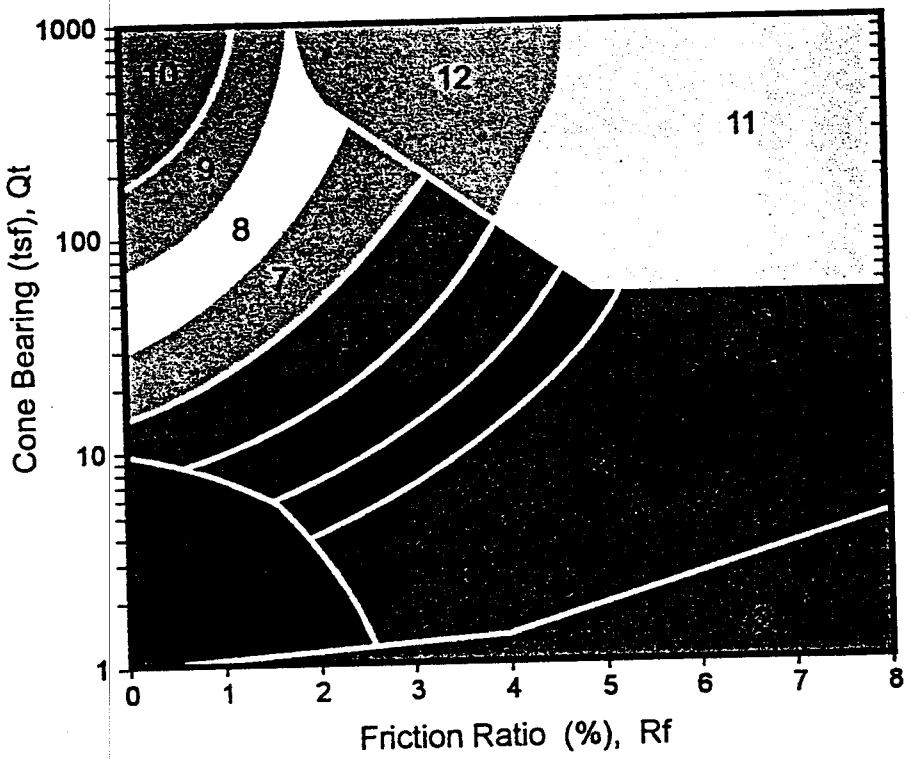
CPT Classification Chart
(after Robertson and Campanella, 1988)



Zone	Q_t / N	Soil Behaviour Type
1	2	sensitive fine grained
2	1	organic material
3	1	clay
4	1.5	silty clay to clay
5	2	clayey silt to silty clay
6	2.5	sandy silt to clayey silt
7	3	silty sand to sandy silt
8	4	sand to silty sand
9	5	sand
10	6	gravelly sand to sand
11	1	very stiff fine grained *
12	2	sand to clayey sand *

* overconsolidated or cemented

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Gregg In Situ, Inc.

Table 2 References

No.	Reference
1	Robertson, P.K. and Campanella, R.G., 1986, "Guidelines for Use, Interpretation and Application of the CPT and CPTU", UBC, Soil Mechanics Series No. 105, Civil Eng. Dept., Vancouver, B.C., Canada
2	Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.
3	Robertson, P.K. and Campanella, R.G., 1989, "Guidelines for Geotechnical Design Using CPT and CPTU", UBC, Soil Mechanics Series No. 120, Civil Eng. Dept., Vancouver, B.C., Canada
4	Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27.
5	Robertson, P.K. and Fear, C.E., 1995, "Liquefaction of Sands and its Evaluation", Keynote Lecture, First International Conference on Earthquake Geotechnical Engineering, Tokyo, Japan.
6	Gregg In Situ Internal Report
7	Robertson, P.K. and Wride, C.E., 1997, "Cyclic Liquefaction and its Evaluation Based on SPT and CPT", NCEER Workshop Paper, January 22, 1997
8	Wride, C.E. and Robertson, P.K., 1997, "Phase II Data Review Report (Massey and Kidd Sites, Fraser River Delta)", Volume 1 - Data Report (June 1997), University of Alberta.
9	Plewes, H.D., Davies, M.P. and Jefferies, M.G., 1992, "CPT Based Screening Procedure for Evaluating Liquefaction Susceptibility", 45th Canadian Geotechnical Conference, Toronto, Ontario, October 1992.

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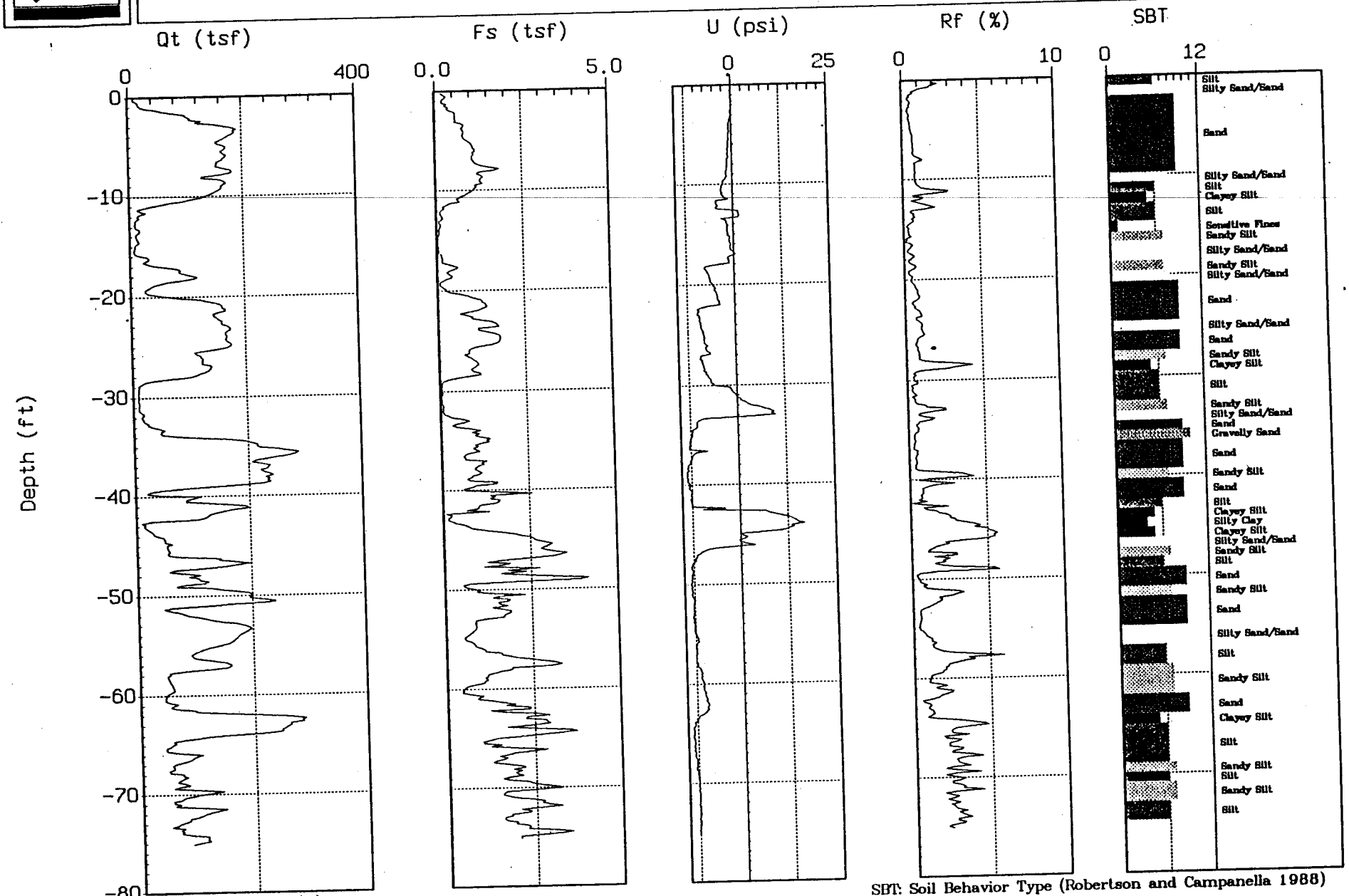
BAGAHI ENGINEERING

Site : NEPTUNE MARINA
Location : CPT-01

Engineer : K. BAGAHI
Date : 01:17:00 .09:46



Max. Depth: 75.13 (ft)

Depth Inc.: 0.164 (ft)

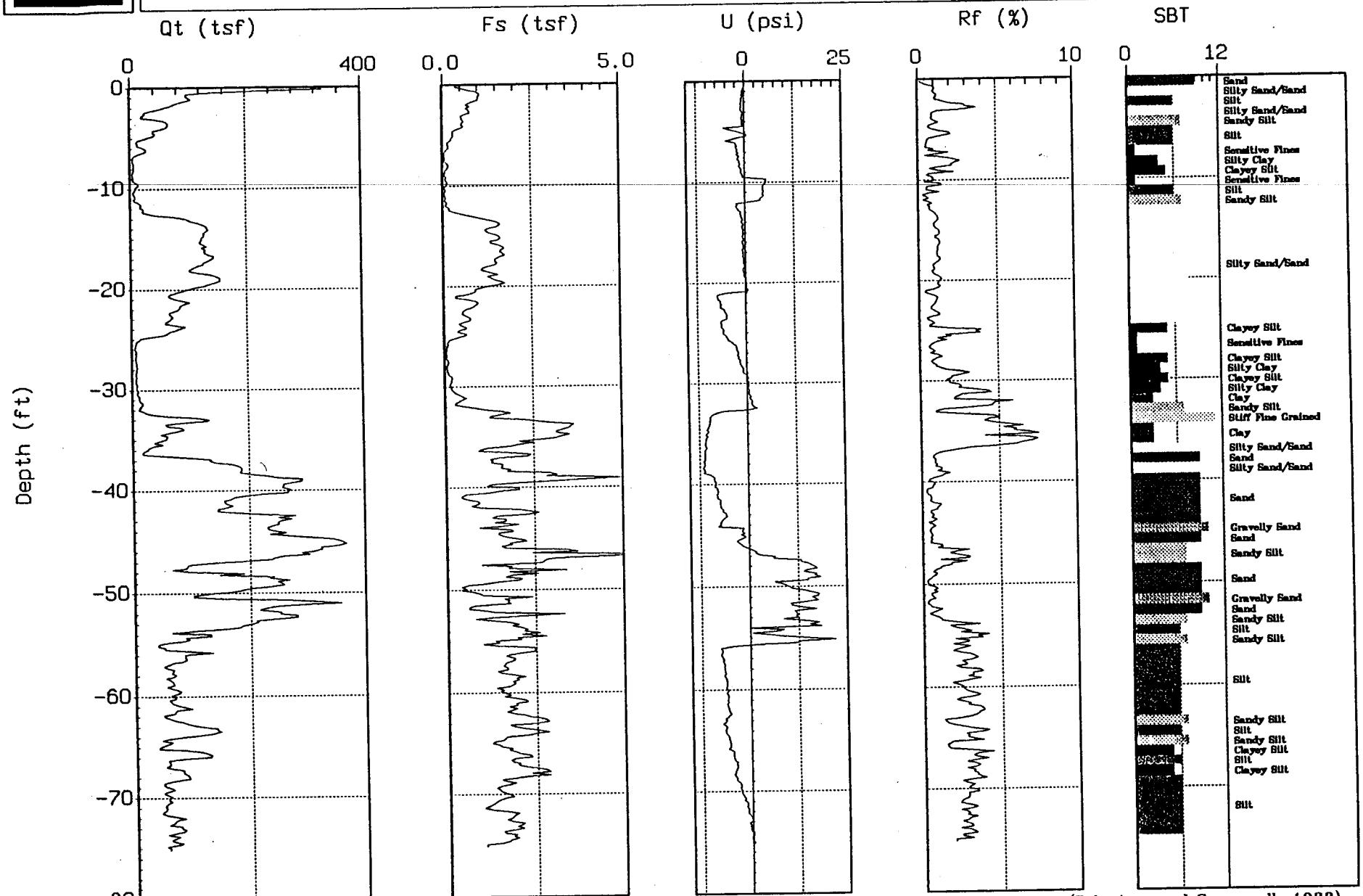
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

BAGAHI ENGINEERING

Site : NEPTUNE MARINA
Location : CPT-02

Engineer : K. BAGAHI
Date : 01:17:00 10:42



Max. Depth: 75.13 (ft)

Depth Inc.: 0.164 (ft)

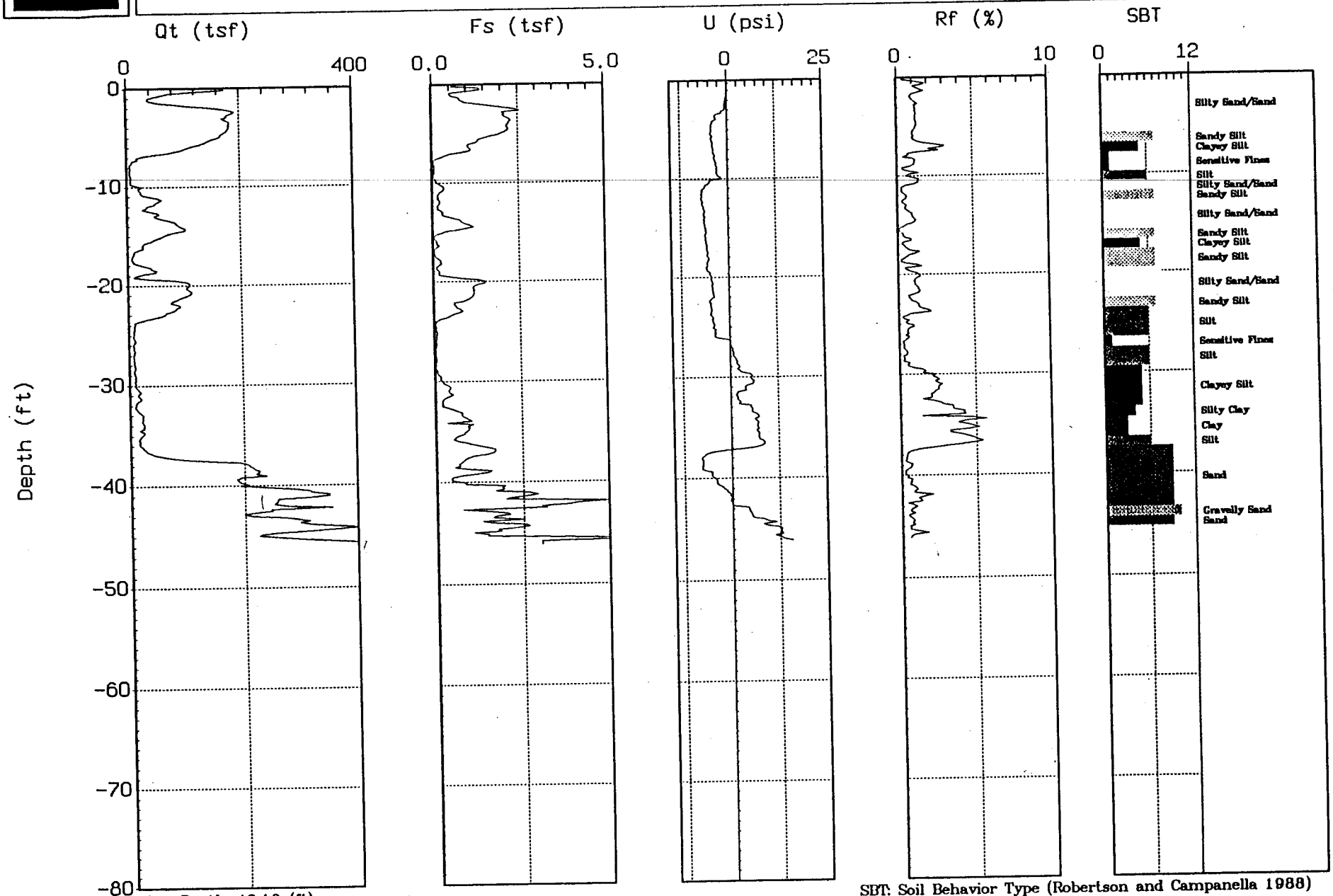
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

BAGAHI ENGINEERING

Site : NEPTUNE MARINA
Location : CPT-03

Engineer : K. BAGAHI
Date : 01:17:00 12:38



Max. Depth: 46.10 (ft)

Depth Inc.: 0.164 (ft)

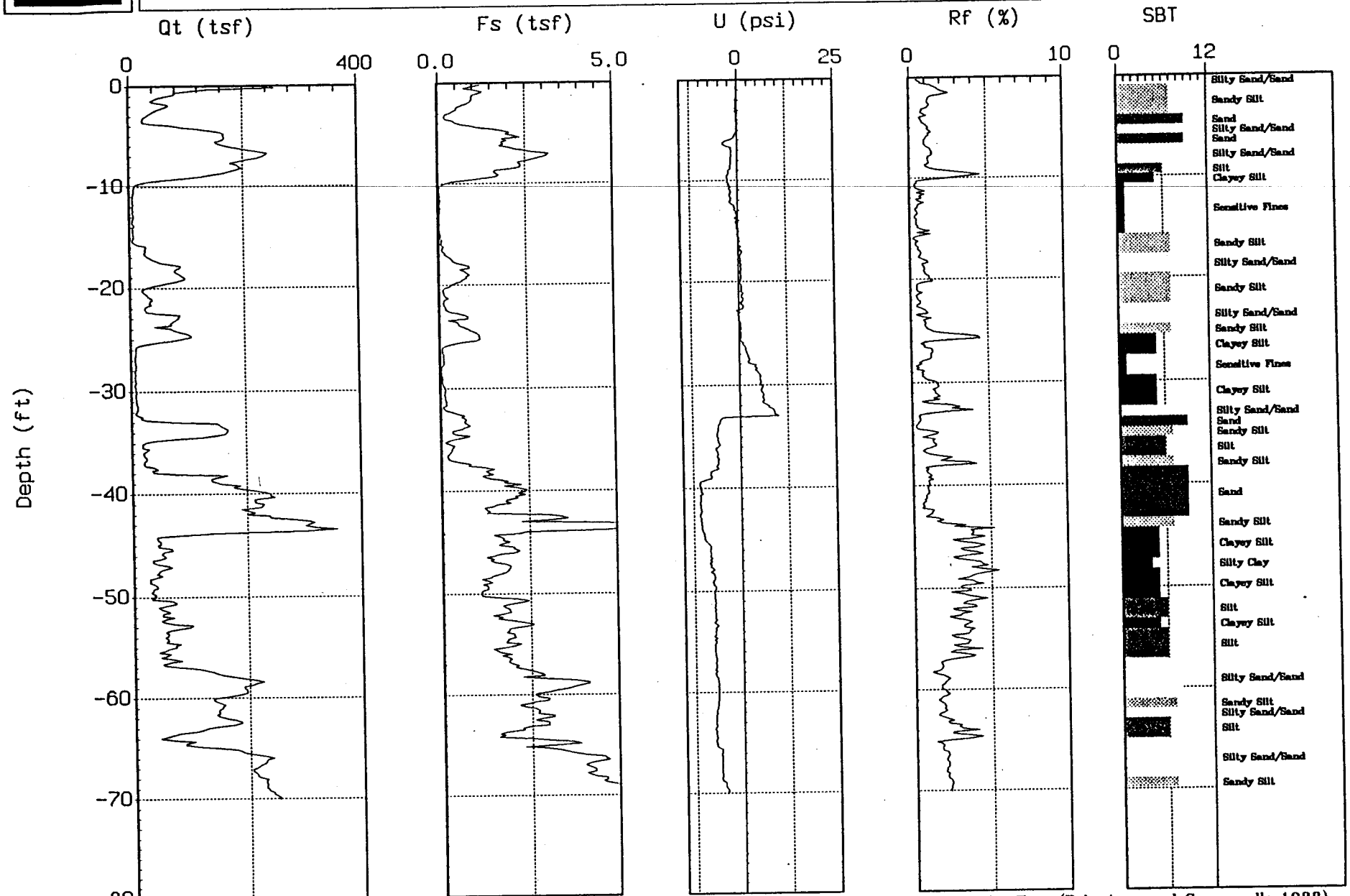
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

BAGAHI ENGINEERING

Site : NEPTUNE MARINA
Location : CPT-04

Engineer : K. BAGAHI
Date : 01:17:00 13:29



Max. Depth: 70.05 (ft)

Depth Inc.: 0.164 (ft)

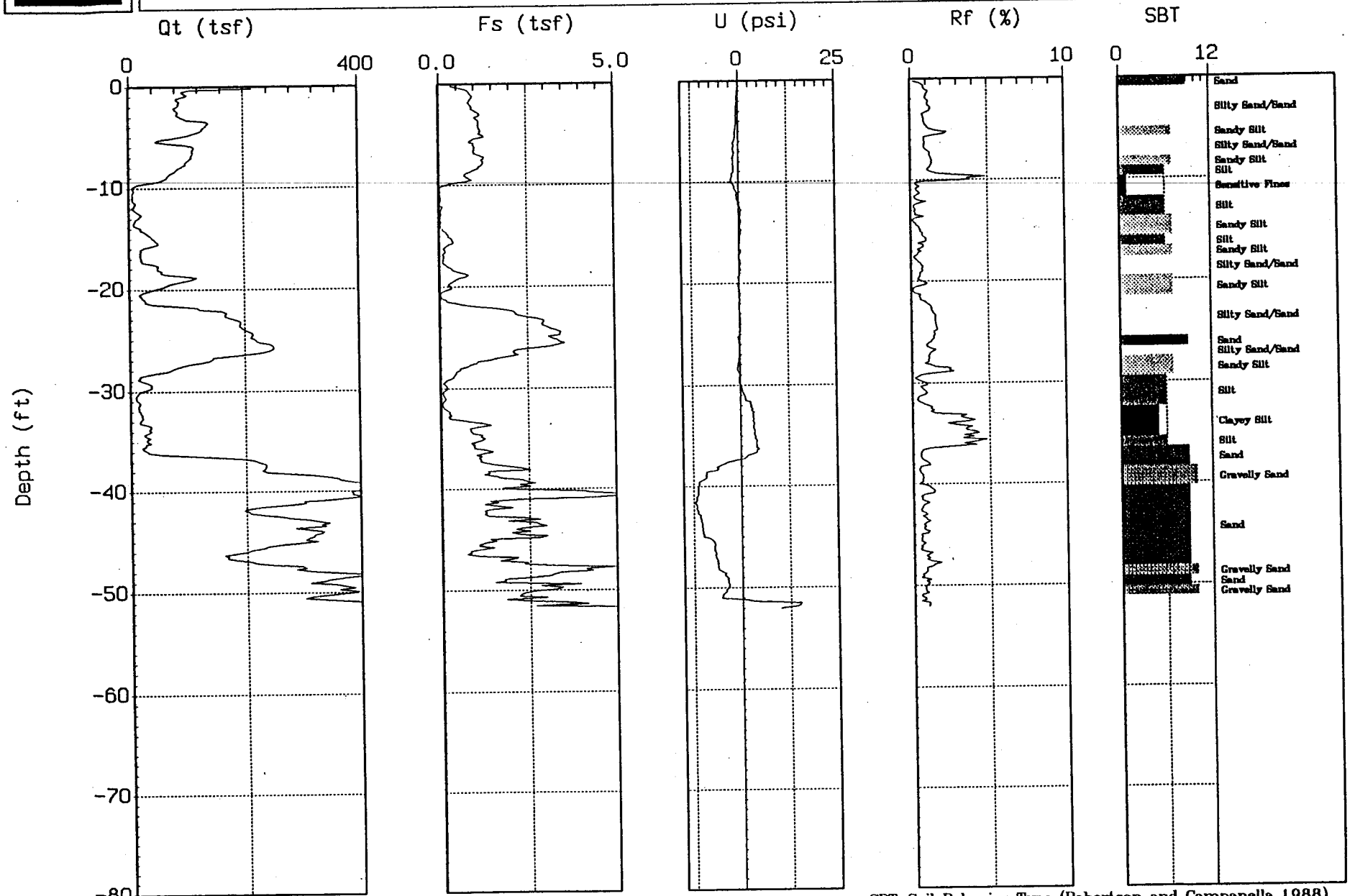
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

BAGAHI ENGINEERING

Site : NEPTUNE MARINA
Location : CPT-05

Engineer : K. BAGAHI
Date : 01:17:00 14:32



Max. Depth: 52.00 (ft)

Depth Inc.: 0.164 (ft)

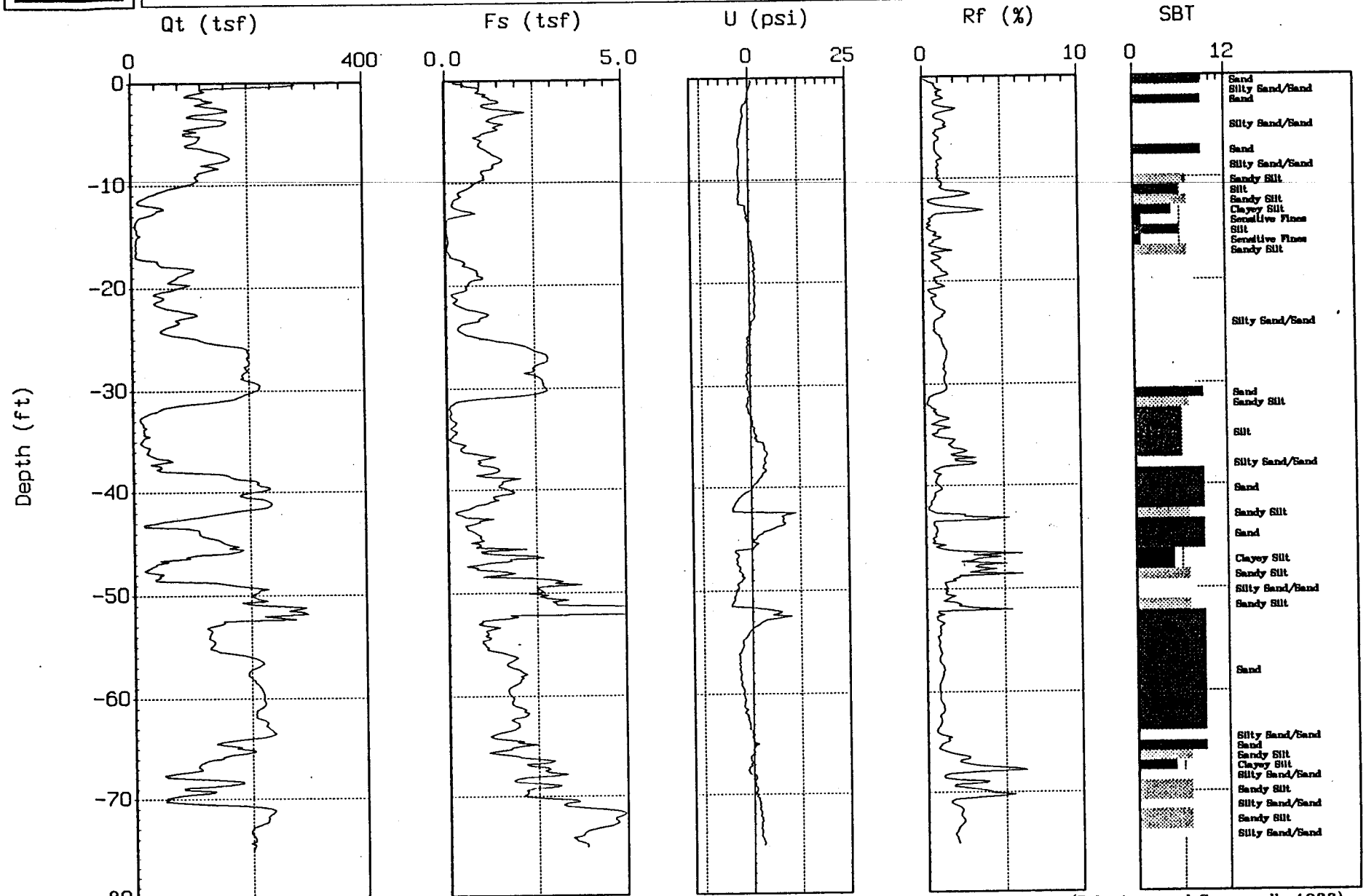
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

BAGAHI ENGINEERING

Site : NEPTUNE MARINA
Location : CPT-06

Engineer : K. BAGAHI
Date : 01:17:00 16:03



Max. Depth: 75.13 (ft)

Depth Inc.: 0.164 (ft)

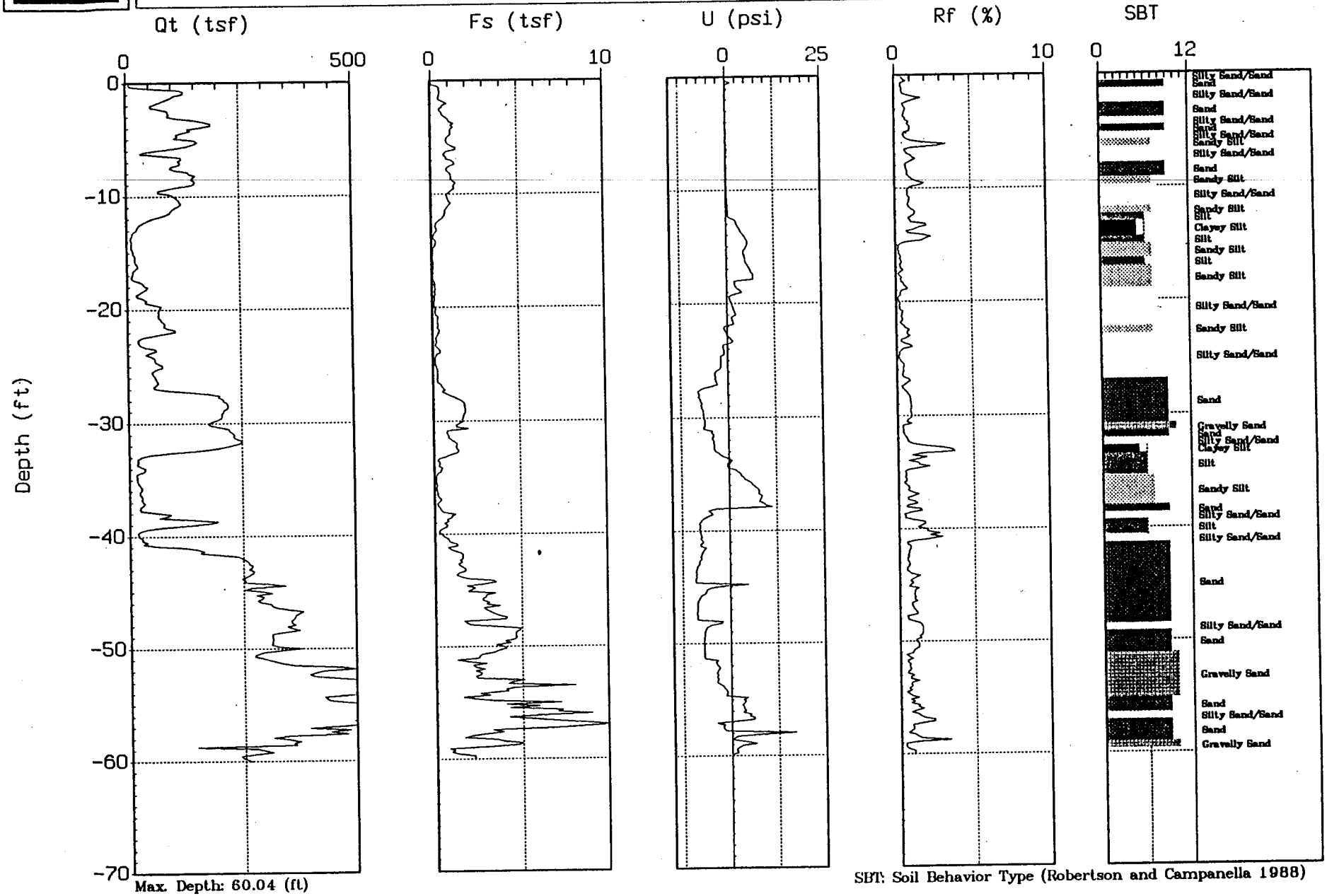
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

BAGAHI ENGINEERING

Site : NEPTUNE MARINA
Location : CPT-7

ENGINEER : KEN BAGAHI
Date : 02:01:00 09:06



Max. Depth: 60.04 (ft)

Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0119-1624-1226
Job No: 00-073TX
Client: BAGAHI ENGINEERING
Project: CPT Site Investigation
Site: NEPTUNE MARINA
Location: CPT-01
Engineer: K. BAGAHI
CPT Date: 00/17/01
CPT Time: 09:46
CPT File: 073C01.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.66 (ft): 12.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
0.49	15.5	0.24	1.54	-0.1	6	114.6	0.03	0.03	0.00	2.00	5.9	11.9	1.24	0.00
1.48	70.3	0.33	0.46	0.0	8	120.9	0.09	0.09	0.00	2.00	16.8	33.7	UnDef	0.31
2.46	130.4	0.57	0.44	-0.2	9	124.1	0.15	0.15	0.00	2.00	25.0	49.9	UnDef	0.00
3.44	184.5	0.75	0.41	-1.1	9	124.1	0.21	0.21	0.00	2.00	35.3	70.7	UnDef	0.00
4.43	163.2	0.81	0.50	-1.7	9	124.1	0.27	0.27	0.00	1.93	31.3	60.3	UnDef	0.00
5.41	168.6	1.04	0.62	-2.1	9	124.1	0.33	0.33	0.00	1.74	32.3	56.2	UnDef	0.00
6.40	161.3	1.07	0.67	-2.5	9	124.1	0.39	0.39	0.00	1.60	30.9	49.4	UnDef	0.00
7.30	172.0	1.24	0.72	-2.7	9	124.1	0.45	0.45	0.00	1.50	32.9	49.3	UnDef	0.00
8.20	153.3	1.43	0.93	-3.2	9	124.1	0.50	0.50	0.00	1.41	29.4	41.4	UnDef	0.00
9.19	159.4	1.24	0.78	-4.0	9	124.1	0.56	0.56	0.00	1.33	30.5	40.7	UnDef	0.00
10.17	112.7	0.93	0.83	-6.5	8	120.9	0.62	0.62	0.00	1.27	27.0	34.2	UnDef	0.34
11.15	29.2	0.45	1.54	-6.3	6	114.6	0.68	0.68	0.00	1.21	11.2	13.6	2.28	0.11
12.14	12.5	0.14	1.09	-7.7	6	114.6	0.74	0.73	0.00	1.17	4.8	5.6	0.94	0.11
13.21	12.4	0.10	0.81	-0.4	6	114.6	0.80	0.76	0.04	1.15	4.7	5.4	0.93	0.10
14.27	12.3	0.05	0.41	-3.7	6	114.6	0.86	0.79	0.07	1.13	4.7	5.3	0.92	0.00
15.26	7.5	0.03	0.33	-2.8	1	79.6	0.91	0.81	0.10	1.11	3.6	4.0	0.53	0.09
16.24	26.3	0.07	0.28	-1.7	7	117.8	0.96	0.82	0.13	1.10	8.4	9.2	UnDef	0.00
17.22	73.6	0.29	0.40	-2.1	8	120.9	1.02	0.85	0.16	1.08	17.6	19.1	UnDef	0.12
18.21	90.1	0.37	0.41	-14.1	8	120.9	1.08	0.88	0.19	1.07	21.6	23.0	UnDef	0.16
19.19	30.6	0.12	0.40	-15.2	7	117.8	1.13	0.91	0.22	1.05	9.8	10.3	UnDef	0.08
20.18	100.2	0.52	0.52	-12.5	8	120.9	1.19	0.94	0.26	1.03	24.0	24.8	UnDef	0.19
21.16	160.1	1.28	0.80	-10.5	9	124.1	1.25	0.97	0.29	1.02	30.7	31.2	UnDef	0.00
22.15	151.8	0.94	0.62	-16.7	9	124.1	1.31	1.00	0.32	1.00	29.1	29.1	UnDef	0.39
23.13	168.4	1.47	0.87	-22.0	9	124.1	1.38	1.03	0.35	0.99	32.2	31.8	UnDef	0.00
24.11	167.2	1.46	0.87	-20.6	9	124.1	1.44	1.06	0.38	0.97	32.0	31.1	UnDef	0.00
25.10	151.1	1.60	1.06	-19.2	8	120.9	1.50	1.09	0.41	0.96	36.2	34.7	UnDef	0.44
26.08	120.9	0.84	0.70	-18.1	9	124.1	1.56	1.12	0.44	0.95	23.1	21.9	UnDef	0.25
27.07	133.4	1.03	0.77	-19.3	9	124.1	1.62	1.15	0.47	0.93	25.5	23.9	UnDef	0.30
28.05	73.3	1.00	1.37	-19.9	7	117.8	1.68	1.18	0.50	0.92	23.4	21.6	UnDef	0.18
29.04	10.4	0.16	1.56	-17.0	5	114.6	1.73	1.20	0.53	0.91	5.0	4.5	0.69	0.09
30.02	8.9	0.04	0.45	-9.1	6	114.6	1.79	1.23	0.56	0.90	3.4	3.1	0.57	0.09
31.00	10.1	0.04	0.38	-0.2	6	114.6	1.85	1.25	0.59	0.89	3.9	3.5	0.66	0.09
31.99	16.5	0.09	0.57	11.2	6	114.6	1.90	1.28	0.62	0.88	6.3	5.6	1.17	0.11
32.97	38.2	0.52	1.35	5.0	7	117.8	1.96	1.31	0.65	0.88	12.2	10.7	UnDef	0.14
33.96	110.7	0.89	0.81	-25.5	8	120.9	2.02	1.33	0.69	0.87	26.5	23.0	UnDef	0.21
34.94	229.6	1.20	0.52	-28.1	9	124.1	2.08	1.36	0.72	0.86	44.0	37.7	UnDef	0.00
35.92	256.4	0.91	0.36	-29.6	10	127.3	2.14	1.39	0.75	0.85	40.9	34.7	UnDef	0.00
36.91	225.6	0.93	0.41	-26.0	9	124.1	2.20	1.43	0.78	0.84	43.2	36.2	UnDef	0.00
37.89	234.0	1.03	0.44	-30.2	9	124.1	2.26	1.46	0.81	0.83	44.8	37.1	UnDef	0.00
38.88	155.1	1.05	0.68	-31.3	9	124.1	2.33	1.49	0.84	0.82	29.7	24.4	UnDef	0.31
39.86	66.0	1.24	1.87	-30.4	7	117.8	2.39	1.52	0.87	0.81	21.1	17.1	UnDef	0.23
40.85	157.7	1.49	0.94	-29.2	9	124.1	2.44	1.54	0.90	0.80	30.2	24.3	UnDef	0.36

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0119-1624-1226
Job No: 00-073TX
Client: BAGAHI ENGINEERING
Project: CPT Site Investigation
Site: NEPTUNE MARINA
Location: CPT-01
Engineer: K. BAGAHI
CPT Date: 00/17/01
CPT Time: 09:46
CPT File: 073C01.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.66 (ft): 12.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.49	5.0E-05	0.00	549.3	1.54	9	29.7	0.0	29.7	4.1	50	64.4	10.0	-0.40	0.0	11.9
1.48	5.0E-03	0.00	814.9	0.46	10	134.6	0.0	134.6	0.0	50	91.7	1.0	-0.31	0.0	33.7
2.46	5.0E-02	0.00	889.4	0.44	10	249.7	0.0	249.7	0.0	50	95.0	1.0	-0.31	0.0	49.9
3.44	5.0E-02	0.00	887.8	0.41	10	353.3	0.0	353.3	0.0	50	95.0	1.0	-0.30	0.0	70.7
4.43	5.0E-02	0.00	606.5	0.50	10	308.1	0.0	308.1	0.0	50	95.0	1.0	-0.29	0.0	60.3
5.41	5.0E-02	0.00	510.3	0.62	10	287.3	0.0	287.3	0.1	48	95.0	1.0	-0.29	0.0	56.2
6.40	5.0E-02	0.00	411.8	0.67	9	252.6	0.0	252.6	0.9	48	93.8	1.0	-0.28	0.0	49.4
7.30	5.0E-02	0.00	383.9	0.72	9	251.8	0.0	251.8	1.5	48	93.7	1.0	-0.28	0.0	49.3
8.20	5.0E-02	0.00	303.9	0.94	9	211.6	0.0	211.6	3.5	46	88.8	1.0	-0.29	0.0	41.4
9.19	5.0E-02	0.00	281.7	0.78	9	207.8	0.0	207.8	3.0	46	88.2	1.0	-0.26	0.0	40.7
10.17	5.0E-03	0.00	179.5	0.83	9	139.6	1.9	141.5	5.5	44	76.8	1.0	-0.22	0.3	34.4
11.15	5.0E-05	-0.01	41.8	1.58	7	34.6	34.4	69.0	23.7	38	36.9	6.0	-0.15	6.1	19.7
12.14	5.0E-05	-0.02	16.0	1.16	6	14.2	56.9	71.1	35.6	32	30.0	6.0	-0.03	5.6	11.1
13.21	5.0E-05	0.00	15.2	0.87	7	13.9	45.1	58.9	33.6	32	30.0	6.0	0.00	5.0	10.4
14.27	5.0E-05	-0.02	14.5	0.44	7	13.5	0.0	13.5	5.0	32	30.0	6.0	0.05	0.0	5.3
15.26	1.0E-07	-0.03	8.2	0.38	6	8.2	32.8	41.0	39.3	UnDef	UnDef	3.0	UnDef	4.0	8.0
16.24	5.0E-04	-0.01	30.7	0.29	7	28.3	0.0	28.3	5.0	36	31.1	1.0	0.02	0.0	9.2
17.22	5.0E-03	0.00	85.1	0.41	9	78.0	0.0	78.0	5.0	42	60.1	1.0	-0.10	0.0	19.1
18.21	5.0E-03	-0.01	101.0	0.41	9	93.9	0.0	93.9	5.0	42	65.5	1.0	-0.11	0.0	23.0
19.19	5.0E-04	-0.02	32.5	0.41	7	31.4	0.0	31.4	5.0	36	34.1	1.0	-0.01	0.0	10.3
20.18	5.0E-03	-0.01	105.7	0.53	9	101.3	4.6	105.9	6.6	42	67.6	1.0	-0.14	0.7	25.5
21.16	5.0E-02	0.00	164.3	0.81	9	159.4	3.7	163.1	5.9	44	80.6	1.0	-0.21	0.5	31.6
22.15	5.0E-02	-0.01	150.9	0.63	9	148.8	0.4	149.2	5.1	44	78.7	1.0	-0.18	0.0	29.2
23.13	5.0E-02	-0.01	162.5	0.88	9	162.5	6.2	168.8	6.4	44	81.2	1.0	-0.22	0.8	32.6
24.11	5.0E-02	-0.01	156.7	0.88	9	159.1	7.3	166.4	6.6	44	80.6	1.0	-0.22	0.9	32.0
25.10	5.0E-03	-0.01	137.6	1.07	9	141.8	15.4	157.2	8.7	44	77.3	1.0	-0.22	2.3	37.0
26.08	5.0E-02	-0.01	106.8	0.71	9	111.9	9.8	121.7	8.0	42	70.5	1.0	-0.16	1.2	23.1
27.07	5.0E-02	-0.01	114.8	0.78	9	121.8	10.8	132.7	8.1	42	72.9	1.0	-0.18	1.3	25.1
28.05	5.0E-04	-0.02	60.9	1.40	7	66.2	35.1	101.3	18.0	40	55.4	1.0	-0.17	6.0	27.6
29.04	5.0E-06	-0.12	7.2	1.88	4	9.3	37.0	46.3	59.2	UnDef	UnDef	3.0	UnDef	4.5	9.1
30.02	5.0E-05	-0.12	5.8	0.56	6	7.9	31.6	39.4	50.4	30	30.0	1.5	0.11	3.1	6.2
31.00	5.0E-05	-0.07	6.6	0.47	6	8.8	35.3	44.1	45.8	30	30.0	3.0	0.11	3.5	6.9
31.99	5.0E-05	-0.02	11.4	0.64	6	14.3	57.3	71.6	36.4	30	30.0	3.0	0.05	5.6	11.2
32.97	5.0E-04	-0.01	27.8	1.43	7	32.7	54.7	87.5	28.4	36	35.3	1.0	-0.10	6.9	17.6
33.96	5.0E-03	-0.01	81.5	0.82	9	93.8	18.2	112.0	11.1	42	65.4	1.0	-0.15	2.6	25.6
34.94	5.0E-02	-0.01	166.9	0.53	9	192.4	0.0	192.4	3.8	44	86.0	1.0	-0.18	0.0	37.7
35.92	5.0E+00	-0.01	182.3	0.36	9	212.5	0.0	212.5	2.0	44	88.9	1.0	-0.15	0.0	34.7
36.91	5.0E-02	-0.01	156.6	0.41	9	184.9	0.0	184.9	3.2	44	84.9	1.0	-0.15	0.0	36.2
37.89	5.0E-02	-0.01	159.1	0.44	9	189.8	0.0	189.8	3.4	44	85.6	1.0	-0.16	0.0	37.1
38.88	5.0E-02	-0.01	102.7	0.69	9	124.5	11.5	136.0	8.2	42	73.5	1.0	-0.16	1.4	25.7
39.86	5.0E-04	-0.03	42.0	1.94	7	52.5	65.4	117.9	25.8	38	48.8	1.0	-0.17	9.1	26.2
40.85	5.0E-02	-0.01	100.5	0.96	9	124.2	20.6	144.7	10.3	42	73.5	1.0	-0.19	2.4	26.7

Gregg In Situ, Inc.
Run No: 00-0119-1624-1226
CPT File: 073C01.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
41.83	130.8	0.85	0.65	-25.8	9	124.1	2.51	1.57	0.93	0.80	25.1	20.0	UnDef	0.23
42.81	16.3	0.22	1.32	14.4	6	114.6	2.56	1.60	0.96	0.79	6.3	4.9	1.10	0.10
43.80	35.1	1.02	2.92	33.6	5	114.6	2.62	1.63	0.99	0.78	16.8	13.2	2.60	0.31
44.78	52.8	2.49	4.71	12.5	4	114.6	2.68	1.65	1.02	0.78	33.7	26.2	4.01	0.00
45.77	74.8	3.02	4.03	0.9	5	114.6	2.73	1.68	1.05	0.77	35.8	27.6	5.76	0.00
46.75	159.7	2.55	1.60	-23.7	8	120.9	2.79	1.71	1.09	0.77	38.2	29.3	UnDef	0.00
47.74	84.4	1.93	2.29	-28.9	7	117.8	2.85	1.73	1.12	0.76	26.9	20.4	UnDef	0.38
48.72	104.0	2.91	2.80	-29.8	6	114.6	2.91	1.76	1.15	0.75	39.8	30.0	8.09	0.00
49.70	184.0	0.74	0.40	-30.3	9	124.1	2.97	1.79	1.18	0.75	35.3	26.4	UnDef	0.31
50.69	174.1	1.69	0.97	-30.3	9	124.1	3.03	1.82	1.21	0.74	33.3	24.7	UnDef	0.40
51.67	73.7	1.63	2.21	-29.3	7	117.8	3.09	1.85	1.24	0.74	23.5	17.3	UnDef	0.39
52.66	157.1	1.49	0.95	-29.6	9	124.1	3.15	1.88	1.27	0.73	30.1	22.0	UnDef	0.33
53.64	185.4	0.84	0.45	-29.6	9	124.1	3.21	1.91	1.30	0.72	35.5	25.7	UnDef	0.29
54.63	157.7	0.60	0.38	-29.0	9	124.1	3.27	1.94	1.33	0.72	30.2	21.7	UnDef	0.21
55.61	103.1	0.87	0.85	-27.7	8	120.9	3.33	1.97	1.36	0.71	24.7	17.6	UnDef	0.18
56.59	134.5	1.76	1.31	-28.5	8	120.9	3.39	2.00	1.39	0.71	32.2	22.8	UnDef	0.31
57.58	86.7	2.68	3.09	-28.5	6	114.6	3.45	2.02	1.42	0.70	33.2	23.4	6.66	0.00
58.56	52.1	1.25	2.40	-26.4	6	114.6	3.50	2.05	1.45	0.70	19.9	13.9	3.89	0.00
59.55	52.8	0.74	1.40	-25.2	7	117.8	3.56	2.08	1.48	0.69	16.9	11.7	UnDef	0.25
60.53	50.0	0.71	1.42	-24.3	7	117.8	3.62	2.10	1.52	0.69	16.0	11.0	UnDef	0.30
61.52	114.5	1.87	1.63	-22.8	7	117.8	3.68	2.13	1.55	0.69	36.5	25.0	UnDef	0.32
62.42	277.6	2.15	0.77	-22.7	9	124.1	3.73	2.16	1.57	0.68	53.2	36.2	UnDef	0.00
63.32	249.2	2.51	1.01	-28.2	9	124.1	3.79	2.18	1.60	0.68	47.7	32.3	UnDef	0.00
64.30	97.0	2.91	3.00	-31.0	6	114.6	3.85	2.21	1.63	0.67	37.1	25.0	7.45	0.00
65.29	49.9	1.22	2.44	-31.1	6	114.6	3.90	2.24	1.66	0.67	19.1	12.8	3.68	0.00
66.27	87.5	2.05	2.35	-30.9	7	117.8	3.96	2.26	1.69	0.66	27.9	18.6	UnDef	0.00
67.26	52.4	1.60	3.06	-30.3	6	114.6	4.02	2.29	1.73	0.66	20.1	13.3	3.87	0.00
68.24	69.4	2.01	2.91	-29.8	6	114.6	4.07	2.32	1.76	0.66	26.6	17.5	5.22	0.00
69.22	85.1	2.06	2.42	-29.1	7	117.8	4.13	2.34	1.79	0.65	27.2	17.8	UnDef	0.00
70.21	83.8	2.25	2.68	-28.9	6	114.6	4.19	2.37	1.82	0.65	32.1	20.9	6.37	0.00
71.19	91.8	2.42	2.63	-28.6	6	114.6	4.24	2.39	1.85	0.65	35.2	22.7	7.00	0.00
72.18	98.2	2.38	2.42	-28.6	7	117.8	4.30	2.42	1.88	0.64	31.4	20.2	UnDef	0.00
73.16	63.9	1.72	2.70	-28.4	6	114.6	4.36	2.45	1.91	0.64	24.5	15.7	4.77	0.00
74.15	92.8	2.76	2.98	-28.4	6	114.6	4.41	2.47	1.94	0.64	35.5	22.6	7.07	0.00

Gregg In Situ, Inc.
Run No: 00-0119-1624-1226
CPT File: 073C01.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
41.83	5.0E-02	-0.01	81.5	0.66	9	102.0	14.9	117.0	9.8	42	67.8	1.0	-0.13	1.7	21.7
42.81	5.0E-05	-0.04	8.6	1.57	6	12.6	50.5	63.1	52.3	30	30.0	3.0	0.01	4.9	9.9
43.80	5.0E-06	0.00	20.0	3.15	6	26.9	107.8	134.7	44.2	UnDef	UnDef	6.0	UnDef	13.2	26.4
44.78	5.0E-07	-0.01	30.3	4.96	1	40.2	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
45.77	5.0E-06	-0.01	42.9	4.19	6	56.5	225.9	282.3	35.4	UnDef	UnDef	6.0	UnDef	27.6	55.3
46.75	5.0E-03	-0.01	91.9	1.62	7	119.6	44.4	164.0	15.1	42	72.4	1.0	-0.23	6.0	35.2
47.74	5.0E-04	-0.02	47.0	2.37	7	62.7	84.8	147.5	26.5	38	53.9	1.0	-0.21	11.5	31.9
48.72	5.0E-05	-0.02	57.4	2.88	7	76.7	101.0	177.7	26.3	40	59.7	10.0	-0.26	16.6	46.6
49.70	5.0E-02	-0.01	101.2	0.41	9	134.6	0.0	134.6	5.0	42	75.8	1.0	-0.11	0.0	26.4
50.69	5.0E-02	-0.01	94.0	0.99	9	126.3	24.5	150.8	11.1	42	74.0	1.0	-0.18	2.8	27.5
51.67	5.0E-04	-0.03	38.2	2.31	7	53.1	95.6	148.6	29.1	38	49.1	1.0	-0.18	11.6	29.0
52.66	5.0E-02	-0.01	82.0	0.97	9	112.2	26.3	138.5	12.1	42	70.6	1.0	-0.17	3.0	24.9
53.64	5.0E-02	-0.01	95.5	0.46	9	131.3	0.0	131.3	5.0	42	75.1	1.0	-0.12	0.0	25.7
54.63	5.0E-02	-0.01	79.7	0.39	9	110.8	0.0	110.8	5.0	42	70.2	1.0	-0.09	0.0	21.7
55.61	5.0E-03	-0.02	50.7	0.87	7	71.9	30.7	102.6	16.2	38	57.8	1.0	-0.11	4.1	21.6
56.59	5.0E-03	-0.02	65.7	1.34	7	93.1	42.9	136.0	16.8	40	65.2	1.0	-0.18	5.6	28.4
57.58	5.0E-05	-0.03	41.1	3.21	6	59.7	159.8	219.5	32.3	38	52.5	6.0	-0.24	19.5	42.9
58.56	5.0E-05	-0.05	23.7	2.58	6	35.6	142.4	178.0	38.1	34	37.7	6.0	-0.14	13.9	27.9
59.55	5.0E-04	-0.05	23.7	1.50	7	35.9	86.3	122.2	31.5	34	37.9	1.0	-0.09	9.3	21.0
60.53	5.0E-04	-0.05	22.1	1.53	7	33.8	98.9	132.7	32.9	34	36.1	1.0	-0.08	9.6	20.6
61.52	5.0E-04	-0.02	52.0	1.69	7	76.8	60.8	137.6	21.6	38	59.7	1.0	-0.18	9.6	34.6
62.42	5.0E-02	-0.01	127.0	0.78	9	185.0	12.4	197.4	7.3	44	84.9	1.0	-0.19	1.5	37.7
63.32	5.0E-02	-0.01	112.4	1.02	9	165.0	24.6	189.6	9.9	42	81.6	1.0	-0.20	2.9	35.2
64.30	5.0E-05	-0.03	42.1	3.12	6	63.8	155.5	219.3	31.6	38	54.4	6.0	-0.24	19.9	44.9
65.29	5.0E-05	-0.06	20.6	2.64	6	32.7	130.6	163.3	41.0	34	35.2	6.0	-0.13	12.8	25.6
66.27	5.0E-04	-0.03	36.9	2.46	6	56.9	119.6	176.5	30.4	38	51.1	1.0	-0.18	13.7	32.2
67.26	5.0E-05	-0.06	21.1	3.32	6	33.9	135.4	169.3	43.9	34	36.2	6.0	-0.16	13.3	26.5
68.24	5.0E-05	-0.04	28.2	3.09	6	44.6	178.4	223.0	37.7	36	44.1	6.0	-0.19	17.5	34.9
69.22	5.0E-04	-0.03	34.6	2.54	6	54.4	136.6	191.0	31.8	38	49.8	1.0	-0.18	14.4	32.1
70.21	5.0E-05	-0.03	33.6	2.82	6	53.3	171.3	224.6	33.6	36	49.2	6.0	-0.19	19.0	39.9
71.19	5.0E-05	-0.03	36.6	2.76	6	58.0	149.7	207.8	32.0	38	51.7	6.0	-0.20	18.6	41.4
72.18	5.0E-04	-0.03	38.8	2.53	6	61.8	124.0	185.8	30.0	38	53.5	1.0	-0.19	14.4	34.6
73.16	5.0E-05	-0.05	24.3	2.89	6	40.0	160.0	199.9	39.3	34	41.0	6.0	-0.16	15.7	31.3
74.15	5.0E-05	-0.03	35.7	3.13	6	57.7	198.7	256.5	34.0	38	51.5	6.0	-0.22	21.3	43.9

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0119-1624-1204
Job No: 00-073TX
Client: BAGAHI ENGINEERING
Project: CPT Site Investigation
Site: NEPTUNE MARINA
Location: CPT-02
Engineer: K. BAGAHI
CPT Date: 00/17/01
CPT Time: 10:42
CPT File: 073C02.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.66 (ft): 12.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
0.49	163.6	0.78	0.48	-0.3	9	124.1	0.03	0.03	0.00	2.00	31.3	62.7	UnDef	0.00
1.48	82.3	0.89	1.08	-1.5	8	120.9	0.09	0.09	0.00	2.00	19.7	39.4	UnDef	0.44
2.46	29.0	0.71	2.45	-2.0	6	114.6	0.15	0.15	0.00	2.00	11.1	22.2	2.31	0.11
3.44	59.9	0.55	0.91	-1.3	8	120.9	0.21	0.21	0.00	2.00	14.3	28.7	UnDef	0.22
4.43	41.2	0.39	0.94	-5.1	7	117.8	0.27	0.27	0.00	1.94	13.1	25.5	UnDef	0.13
5.41	15.3	0.21	1.35	-3.8	6	114.6	0.32	0.32	0.00	1.76	5.9	10.3	1.20	0.09
6.40	17.0	0.09	0.54	-5.0	6	114.6	0.38	0.38	0.00	1.62	6.5	10.6	1.33	0.08
7.30	4.9	0.05	1.07	-4.0	1	79.6	0.42	0.42	0.00	1.54	2.3	3.6	0.36	0.08
8.20	4.8	0.10	2.15	-2.8	4	114.6	0.47	0.47	0.00	1.46	3.1	4.5	0.35	0.08
9.19	8.2	0.08	0.92	0.6	5	114.6	0.52	0.52	0.00	1.38	3.9	5.4	0.62	0.10
10.17	6.9	0.06	0.90	11.3	5	114.6	0.58	0.58	0.00	1.31	3.3	4.3	0.50	0.09
11.15	11.2	0.06	0.52	10.3	6	114.6	0.64	0.64	0.00	1.25	4.3	5.4	0.85	0.08
12.14	25.4	0.16	0.63	-1.6	7	117.8	0.69	0.69	0.00	1.20	8.1	9.8	UnDef	0.09
13.21	106.2	1.08	1.01	-2.6	8	120.9	0.76	0.72	0.04	1.18	25.4	30.0	UnDef	0.30
14.27	128.9	1.35	1.05	-1.7	8	120.9	0.82	0.75	0.07	1.15	30.9	35.6	UnDef	0.42
15.26	123.6	1.49	1.20	-1.4	8	120.9	0.88	0.78	0.10	1.13	29.6	33.5	UnDef	0.40
16.24	130.9	1.64	1.25	-1.6	8	120.9	0.94	0.81	0.13	1.11	31.3	34.8	UnDef	0.45
17.22	129.9	1.55	1.20	-1.4	8	120.9	1.00	0.84	0.16	1.09	31.1	34.0	UnDef	0.42
18.21	118.1	1.24	1.05	-1.0	8	120.9	1.06	0.87	0.19	1.07	28.3	30.4	UnDef	0.32
19.19	144.0	1.49	1.03	-0.6	8	120.9	1.12	0.90	0.22	1.06	34.5	36.4	UnDef	0.46
20.18	83.3	1.08	1.29	0.5	8	120.9	1.18	0.92	0.26	1.04	19.9	20.7	UnDef	0.20
21.16	85.4	0.63	0.74	-12.7	8	120.9	1.24	0.95	0.29	1.02	20.5	21.0	UnDef	0.17
22.15	73.7	0.72	0.98	-14.7	8	120.9	1.30	0.98	0.32	1.01	17.6	17.8	UnDef	0.16
23.13	66.6	0.65	0.97	-12.0	8	120.9	1.36	1.01	0.35	0.99	15.9	15.9	UnDef	0.14
24.11	72.3	0.48	0.67	-14.6	8	120.9	1.42	1.04	0.38	0.98	17.3	17.0	UnDef	0.14
25.10	13.5	0.37	2.72	-12.6	5	114.6	1.48	1.07	0.41	0.97	6.5	6.2	0.96	0.10
26.08	6.4	0.06	0.99	-7.5	1	79.6	1.52	1.08	0.44	0.96	3.1	3.0	0.39	0.08
27.07	6.6	0.06	0.94	-5.1	1	79.6	1.56	1.09	0.47	0.96	3.2	3.0	0.40	0.08
28.05	7.5	0.07	0.91	-3.3	5	114.6	1.61	1.11	0.50	0.95	3.6	3.4	0.47	0.08
29.04	7.3	0.16	2.22	-0.7	4	114.6	1.67	1.13	0.53	0.94	4.7	4.4	0.45	0.00
30.02	8.5	0.18	2.07	0.6	5	114.6	1.72	1.16	0.56	0.93	4.0	3.8	0.54	0.09
31.00	13.7	0.44	3.21	1.5	4	114.6	1.78	1.19	0.59	0.92	8.7	8.0	0.95	0.00
31.99	19.0	0.79	4.16	3.4	3	111.4	1.84	1.21	0.62	0.91	18.2	16.5	1.37	0.00
32.97	93.6	1.79	1.91	-16.3	7	117.8	1.89	1.24	0.65	0.90	29.9	26.9	UnDef	0.29
33.96	69.4	3.37	4.85	-22.7	11	130.5	1.95	1.27	0.69	0.89	66.5	59.1	UnDef	0.00
34.94	50.9	3.00	5.90	-24.2	3	111.4	2.01	1.30	0.72	0.88	48.8	42.8	3.91	0.00
35.92	23.7	1.58	6.66	-25.1	3	111.4	2.07	1.32	0.75	0.87	22.7	19.8	1.73	0.00
36.91	123.1	1.79	1.45	-25.7	8	120.9	2.12	1.35	0.78	0.86	29.5	25.4	UnDef	0.33
37.89	188.6	1.60	0.85	-26.2	9	124.1	2.18	1.38	0.81	0.85	36.1	30.8	UnDef	0.00
38.88	267.6	3.55	1.33	-23.6	8	120.9	2.24	1.41	0.84	0.84	64.1	54.0	UnDef	0.00
39.86	258.2	1.70	0.66	-19.7	9	124.1	2.31	1.44	0.87	0.83	49.5	41.3	UnDef	0.00
40.85	167.6	0.68	0.40	-18.5	9	124.1	2.37	1.47	0.90	0.83	32.1	26.5	UnDef	0.31

Gregg In Situ, Inc.
Run No: 00-0119-1624-1204
CPT File: 073C02.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
41.83	169.4	1.32	0.78	-16.9	9	124.1	2.43	1.50	0.93	0.82	32.4	26.5	UnDef	0.39
42.81	260.0	1.82	0.70	-14.3	9	124.1	2.49	1.53	0.96	0.81	49.8	40.3	UnDef	0.00
43.80	241.1	1.59	0.66	-14.6	9	124.1	2.55	1.56	0.99	0.80	46.2	37.0	UnDef	0.00
44.78	335.4	1.79	0.53	-3.4	10	127.3	2.61	1.59	1.02	0.79	53.5	42.5	UnDef	0.00
45.77	319.3	2.33	0.73	-4.5	9	124.1	2.67	1.62	1.05	0.79	61.2	48.1	UnDef	0.00
46.75	190.6	3.91	2.05	7.7	7	117.8	2.73	1.65	1.09	0.78	60.9	47.4	UnDef	0.00
47.74	112.8	2.06	1.83	35.0	7	117.8	2.79	1.67	1.12	0.77	36.0	27.8	UnDef	0.34
48.72	251.4	1.95	0.77	36.6	9	124.1	2.85	1.70	1.15	0.77	48.2	36.9	UnDef	0.00
49.70	170.2	0.62	0.37	23.2	9	124.1	2.91	1.73	1.18	0.76	32.6	24.8	UnDef	0.27
50.69	246.9	1.56	0.63	37.6	9	124.1	2.97	1.76	1.21	0.75	47.3	35.6	UnDef	0.00
51.67	244.2	1.03	0.42	31.7	10	127.3	3.03	1.80	1.24	0.75	39.0	29.1	UnDef	0.00
52.66	224.8	1.81	0.80	25.9	9	124.1	3.10	1.83	1.27	0.74	43.1	31.9	UnDef	0.00
53.64	126.7	2.16	1.70	28.5	7	117.8	3.16	1.86	1.30	0.73	40.5	29.7	UnDef	0.37
54.63	65.1	1.95	3.00	22.1	6	114.6	3.21	1.88	1.33	0.73	24.9	18.2	4.95	0.00
55.61	82.2	1.99	2.43	2.8	7	117.8	3.27	1.91	1.36	0.72	26.3	19.0	UnDef	0.00
56.59	69.6	1.76	2.53	-16.8	6	114.6	3.33	1.93	1.39	0.72	26.7	19.2	5.30	0.00
57.58	62.3	1.56	2.51	-15.8	6	114.6	3.38	1.96	1.42	0.71	23.9	17.0	4.71	0.00
58.56	59.1	1.93	3.27	-15.3	6	114.6	3.44	1.99	1.45	0.71	22.6	16.1	4.45	0.00
59.55	67.9	1.59	2.35	-14.3	6	114.6	3.50	2.01	1.48	0.71	26.0	18.3	5.15	0.00
60.53	66.3	1.93	2.91	-14.0	6	114.6	3.55	2.04	1.52	0.70	25.4	17.8	5.02	0.00
61.52	65.5	1.81	2.77	-13.8	6	114.6	3.61	2.06	1.55	0.70	25.1	17.5	4.95	0.00
62.42	77.3	2.55	3.30	-13.6	6	114.6	3.66	2.09	1.57	0.69	29.6	20.5	5.89	0.00
63.32	130.0	2.25	1.73	-15.4	7	117.8	3.71	2.11	1.60	0.69	41.5	28.6	UnDef	0.39
64.30	56.5	1.78	3.14	-14.5	6	114.6	3.77	2.14	1.63	0.68	21.7	14.8	4.22	0.00
65.29	87.3	1.57	1.80	-13.0	7	117.8	3.83	2.16	1.66	0.68	27.9	18.9	UnDef	0.32
66.27	71.8	2.00	2.79	-10.8	6	114.6	3.88	2.19	1.69	0.68	27.5	18.6	5.44	0.00
67.26	72.5	2.36	3.26	-9.1	6	114.6	3.94	2.22	1.73	0.67	27.8	18.7	5.49	0.00
68.24	66.2	2.05	3.10	-9.9	6	114.6	4.00	2.24	1.76	0.67	25.3	16.9	4.97	0.00
69.22	52.8	1.52	2.89	-7.6	6	114.6	4.05	2.27	1.79	0.66	20.2	13.4	3.90	0.00
70.21	53.8	1.56	2.91	-5.6	6	114.6	4.11	2.29	1.82	0.66	20.6	13.6	3.98	0.00
71.19	47.1	1.22	2.59	-3.5	6	114.6	4.17	2.32	1.85	0.66	18.1	11.9	3.44	0.40
72.18	65.7	1.77	2.70	-1.8	6	114.6	4.22	2.34	1.88	0.65	25.2	16.4	4.92	0.00
73.16	71.1	1.91	2.68	-1.2	6	114.6	4.28	2.37	1.91	0.65	27.3	17.7	5.35	0.00
74.15	66.8	1.76	2.63	-0.3	6	114.6	4.34	2.40	1.94	0.65	25.6	16.5	5.00	0.00

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0119-1624-1204
Job No: 00-073TX
Client: BAGAHI ENGINEERING
Project: CPT Site Investigation
Site: NEPTUNE MARINA
Location: CPT-02
Engineer: K. BAGAHI
CPT Date: 00/17/01
CPT Time: 10:42
CPT File: 073C02.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.66 (ft): 12.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.49	5.0E-02	0.00	1000.0	0.48	10	313.4	0.0	313.4	0.0	50	95.0	1.0	-0.33	0.0	62.7
1.48	5.0E-03	0.00	905.2	1.08	9	157.7	0.0	157.7	1.0	50	95.0	1.0	-0.41	0.0	39.4
2.46	5.0E-05	0.00	194.0	2.47	7	55.6	14.9	70.5	12.9	44	58.5	10.0	-0.37	3.4	25.6
3.44	5.0E-03	0.00	288.8	0.92	9	114.8	0.0	114.8	3.6	46	74.6	1.0	-0.28	0.0	28.7
4.43	5.0E-04	0.00	154.1	0.95	9	78.2	4.8	83.0	7.2	44	60.2	1.0	-0.22	1.0	26.5
5.41	5.0E-05	-0.01	46.4	1.38	7	26.4	19.7	46.1	21.0	38	30.0	6.0	-0.14	3.8	14.1
6.40	5.0E-05	-0.01	43.8	0.55	9	27.0	9.6	36.6	14.8	38	30.0	6.0	-0.06	2.1	12.6
7.30	1.0E-07	-0.03	10.5	1.17	6	7.3	29.4	36.7	44.0	UnDef	UnDef	3.0	UnDef	3.6	7.2
8.20	5.0E-07	-0.02	9.3	2.39	4	6.9	27.5	34.4	56.4	UnDef	UnDef	3.0	UnDef	4.5	9.0
9.19	5.0E-06	0.00	14.7	0.98	6	11.1	44.4	55.5	35.5	UnDef	UnDef	6.0	UnDef	5.4	10.9
10.17	5.0E-06	0.06	10.8	0.98	6	8.8	35.3	44.1	41.6	UnDef	UnDef	3.0	UnDef	4.3	8.6
11.15	5.0E-05	0.03	16.6	0.55	7	13.8	22.8	36.5	28.3	32	30.0	6.0	0.03	3.4	8.8
12.14	5.0E-04	0.00	35.8	0.65	7	29.9	16.3	46.2	18.2	38	32.7	1.0	-0.06	2.8	12.5
13.21	5.0E-03	0.00	146.4	1.02	9	122.5	10.5	132.9	8.0	44	73.1	1.0	-0.23	1.6	31.5
14.27	5.0E-03	0.00	170.4	1.06	9	145.5	9.1	154.6	7.2	44	78.0	1.0	-0.24	1.4	37.0
15.26	5.0E-03	0.00	157.3	1.21	9	137.0	14.6	151.6	8.6	44	76.3	1.0	-0.25	2.1	35.7
16.24	5.0E-03	0.00	160.6	1.26	9	142.4	15.8	158.2	8.7	44	77.4	1.0	-0.26	2.3	37.2
17.22	5.0E-03	0.00	153.8	1.20	9	138.8	15.3	154.1	8.7	44	76.7	1.0	-0.25	2.2	36.2
18.21	5.0E-03	0.00	135.0	1.06	9	124.2	13.9	138.1	8.8	44	73.5	1.0	-0.22	2.0	32.4
19.19	5.0E-03	0.00	159.6	1.04	9	149.0	10.7	159.7	7.5	44	78.7	1.0	-0.24	1.6	38.0
20.18	5.0E-03	0.00	88.9	1.31	9	84.8	25.5	110.3	13.7	42	62.5	1.0	-0.20	3.5	24.3
21.16	5.0E-03	-0.01	88.3	0.75	9	85.6	12.7	98.3	9.8	42	62.8	1.0	-0.15	1.8	22.8
22.15	5.0E-03	-0.01	73.7	0.99	9	72.7	20.7	93.4	13.3	40	58.2	1.0	-0.16	2.9	20.7
23.13	5.0E-03	-0.01	64.5	0.99	9	64.8	22.3	87.1	14.6	40	54.8	1.0	-0.15	3.0	18.9
24.11	5.0E-03	-0.01	68.2	0.68	9	69.4	14.7	84.1	11.6	40	56.8	1.0	-0.12	2.1	19.1
25.10	5.0E-06	-0.07	11.2	3.05	4	12.8	51.1	63.8	55.8	UnDef	UnDef	3.0	UnDef	6.2	12.5
26.08	1.0E-07	-0.14	4.5	1.29	4	6.0	24.2	30.2	66.5	UnDef	UnDef	1.5	UnDef	3.0	5.9
27.07	1.0E-07	-0.13	4.6	1.23	4	6.2	24.7	30.9	65.2	UnDef	UnDef	1.5	UnDef	3.0	6.0
28.05	5.0E-06	-0.10	5.3	1.16	4	7.0	28.0	35.0	60.4	UnDef	UnDef	1.5	UnDef	3.4	6.9
29.04	5.0E-07	-0.10	5.0	2.88	1	6.7	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDef
30.02	5.0E-06	-0.08	5.8	2.61	4	7.7	30.7	38.4	70.1	UnDef	UnDef	1.5	UnDef	3.8	7.5
31.00	5.0E-07	-0.05	10.0	3.69	1	12.3	UnDef	UnDef	100.0	UnDef	UnDef	3.0	UnDef	UnDef	UnDef
31.99	5.0E-08	-0.03	14.1	4.61	1	16.9	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
32.97	5.0E-04	-0.01	74.2	1.95	7	82.4	49.2	131.6	19.0	40	61.7	1.0	-0.23	8.2	35.1
33.96	1.0E-15	-0.02	53.3	4.99	6	60.4	242.4	302.8	35.0	40	52.8	1.0	-0.43	59.3	118.3
34.94	5.0E-08	-0.03	37.7	6.14	1	43.8	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
35.92	5.0E-08	-0.07	16.4	7.29	1	20.2	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
36.91	5.0E-03	-0.01	89.9	1.48	7	103.8	35.5	139.4	14.6	42	68.4	1.0	-0.22	4.8	30.2
37.89	5.0E-02	-0.01	135.4	0.86	9	157.3	10.9	168.2	7.4	44	80.3	1.0	-0.20	1.3	32.1
38.88	5.0E-03	-0.01	188.8	1.34	9	220.9	20.0	240.9	8.1	44	90.0	1.0	-0.28	3.0	57.0
39.86	5.0E-02	-0.01	178.3	0.66	9	210.9	0.0	210.9	4.4	44	88.7	1.0	-0.20	0.0	41.3
40.85	5.0E-02	-0.01	112.7	0.41	9	135.5	0.0	135.5	5.0	42	76.0	1.0	-0.12	0.0	26.5

Gregg In Situ, Inc.
Run No: 00-0119-1624-1204
CPT File: 073C02.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
41.83	5.0E-02	-0.01	111.6	0.79	9	135.6	13.2	148.7	8.3	42	76.0	1.0	-0.18	1.6	28.1
42.81	5.0E-02	-0.01	168.7	0.71	9	205.9	0.2	206.2	5.0	44	88.0	1.0	-0.20	0.0	40.3
43.80	5.0E-02	-0.01	153.3	0.67	9	189.1	1.6	190.7	5.3	44	85.5	1.0	-0.19	0.2	37.2
44.78	5.0E+00	0.00	209.6	0.54	9	260.5	0.0	260.5	2.7	46	94.7	1.0	-0.20	0.0	42.5
45.77	5.0E-02	0.00	195.6	0.73	9	245.6	0.0	245.6	4.4	46	93.0	1.0	-0.22	0.0	48.1
46.75	5.0E-04	0.00	114.0	2.08	7	145.3	56.4	201.7	15.5	42	78.0	1.0	-0.28	10.0	57.5
47.74	5.0E-04	0.00	65.7	1.87	7	85.3	56.4	141.7	19.9	40	62.7	1.0	-0.21	9.2	37.0
48.72	5.0E-02	0.00	145.9	0.78	9	188.5	7.5	196.0	6.4	44	85.4	1.0	-0.20	0.9	37.8
49.70	5.0E-02	0.00	96.5	0.37	9	126.5	0.0	126.5	5.0	42	74.0	1.0	-0.10	0.0	24.8
50.69	5.0E-02	0.00	138.3	0.64	9	181.9	3.7	185.6	5.7	44	84.4	1.0	-0.18	0.4	36.1
51.67	5.0E+00	0.00	134.3	0.43	9	178.4	0.0	178.4	4.2	44	83.9	1.0	-0.14	0.0	29.1
52.66	5.0E-02	0.00	121.4	0.82	9	162.8	13.6	176.4	7.9	42	81.2	1.0	-0.19	1.6	33.5
53.64	5.0E-04	0.00	66.6	1.75	7	91.1	54.7	145.7	19.1	40	64.6	1.0	-0.20	9.1	38.8
54.63	5.0E-05	-0.01	32.9	3.16	6	46.4	185.6	232.0	35.5	36	45.3	6.0	-0.21	18.2	36.3
55.61	5.0E-04	-0.02	41.4	2.53	7	58.3	104.6	162.9	29.1	38	51.8	1.0	-0.20	12.8	31.8
56.59	5.0E-05	-0.03	34.2	2.65	6	49.0	134.6	183.6	32.5	38	46.8	6.0	-0.19	16.2	35.4
57.58	5.0E-05	-0.03	30.0	2.65	6	43.5	161.6	205.1	34.5	36	43.4	6.0	-0.17	16.6	33.6
58.56	5.0E-05	-0.03	28.0	3.48	6	41.0	164.1	205.1	39.5	36	41.7	6.0	-0.20	16.1	32.1
59.55	5.0E-05	-0.03	32.0	2.48	6	46.8	131.5	178.3	32.6	36	45.5	6.0	-0.17	15.7	34.0
60.53	5.0E-05	-0.03	30.8	3.08	6	45.4	181.8	227.2	36.2	36	44.7	6.0	-0.20	17.8	35.6
61.52	5.0E-05	-0.03	30.0	2.93	6	44.6	178.5	223.1	35.9	36	44.1	6.0	-0.18	17.5	34.9
62.42	5.0E-05	-0.03	35.3	3.47	6	52.4	209.5	261.9	35.7	38	48.7	6.0	-0.23	20.5	41.0
63.32	5.0E-04	-0.02	59.8	1.78	7	87.6	61.6	149.2	20.5	40	63.5	1.0	-0.20	9.9	38.5
64.30	5.0E-05	-0.04	24.7	3.37	6	37.8	151.4	189.2	41.2	34	39.4	6.0	-0.18	14.8	29.6
65.29	5.0E-04	-0.02	38.6	1.89	7	58.1	79.3	137.4	26.6	38	51.7	1.0	-0.16	10.7	29.7
66.27	5.0E-05	-0.03	31.0	2.95	6	47.5	190.0	237.6	35.4	36	45.9	6.0	-0.19	18.6	37.2
67.26	5.0E-05	-0.03	31.0	3.45	6	47.7	190.7	238.4	37.7	36	46.0	6.0	-0.22	18.7	37.3
68.24	5.0E-05	-0.03	27.7	3.30	6	43.3	173.0	216.3	38.9	36	43.3	6.0	-0.19	16.9	33.9
69.22	5.0E-05	-0.04	21.5	3.13	6	34.3	137.1	171.4	42.7	34	36.6	6.0	-0.15	13.4	26.8
70.21	5.0E-05	-0.04	21.7	3.15	6	34.8	139.1	173.9	42.6	34	37.0	6.0	-0.15	13.6	27.2
71.19	5.0E-05	-0.05	18.5	2.85	6	30.3	121.2	151.4	44.1	32	33.0	6.0	-0.12	11.9	23.7
72.18	5.0E-05	-0.03	26.2	2.89	6	42.0	167.9	209.8	37.9	36	42.4	6.0	-0.17	16.4	32.9
73.16	5.0E-05	-0.03	28.2	2.85	6	45.2	180.9	226.1	36.5	36	44.5	6.0	-0.17	17.7	35.4
74.15	5.0E-05	-0.03	26.1	2.81	6	42.2	169.0	211.2	37.7	36	42.6	6.0	-0.16	16.5	33.1

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0119-1624-1210
Job No: 00-073TX
Client: BAGAHI ENGINEERING
Project: CPT Site Investigation
Site: NEPTUNE MARINA
Location: CPT-03
Engineer: K. BAGAHI
CPT Date: 00/17/01
CPT Time: 12:38
CPT File: 073C03.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.66 (ft): 12.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
0.49	89.2	0.92	1.03	0.2	8	120.9	0.03	0.03	0.00	2.00	21.4	42.7	UnDef	0.00
1.48	79.5	0.88	1.11	-0.4	8	120.9	0.09	0.09	0.00	2.00	19.0	38.1	UnDef	0.41
2.46	181.4	2.14	1.18	-1.3	8	120.9	0.15	0.15	0.00	2.00	43.4	86.9	UnDef	0.00
3.44	179.1	2.20	1.23	-6.0	8	120.9	0.21	0.21	0.00	2.00	42.9	85.8	UnDef	0.00
4.43	173.5	2.16	1.24	-9.5	8	120.9	0.27	0.27	0.00	1.93	41.5	80.3	UnDef	0.00
5.41	138.9	1.51	1.09	-9.8	8	120.9	0.33	0.33	0.00	1.75	33.2	58.1	UnDef	0.00
6.40	72.2	1.03	1.42	-9.2	7	117.8	0.39	0.39	0.00	1.61	23.1	37.1	UnDef	0.27
7.30	11.9	0.26	2.20	-8.3	5	114.6	0.44	0.44	0.00	1.51	5.7	8.6	0.92	0.14
8.20	5.0	0.05	0.91	-7.4	1	79.6	0.48	0.48	0.00	1.44	2.4	3.4	0.36	0.08
9.19	5.9	0.05	0.76	-6.6	1	79.6	0.52	0.52	0.00	1.39	2.8	3.9	0.43	0.09
10.17	20.7	0.23	1.11	-9.5	6	114.6	0.57	0.57	0.00	1.33	7.9	10.5	1.61	0.09
11.15	47.7	0.18	0.37	-15.4	8	120.9	0.63	0.63	0.00	1.26	11.4	14.4	UnDef	0.10
12.14	38.7	0.17	0.43	-15.9	7	117.8	0.69	0.68	0.00	1.21	12.4	15.0	UnDef	0.09
13.21	65.9	0.42	0.63	-14.7	8	120.9	0.75	0.71	0.04	1.19	15.8	18.7	UnDef	0.14
14.27	91.8	0.95	1.04	-14.5	8	120.9	0.81	0.74	0.07	1.16	22.0	25.5	UnDef	0.23
15.26	48.8	0.14	0.28	-13.9	8	120.9	0.87	0.77	0.10	1.14	11.7	13.3	UnDef	0.09
16.24	20.4	0.10	0.50	-13.6	7	117.8	0.93	0.80	0.13	1.12	6.5	7.3	UnDef	0.09
17.22	8.4	0.06	0.66	-13.0	5	114.6	0.99	0.83	0.16	1.10	4.0	4.4	0.59	0.09
18.21	38.0	0.16	0.42	-12.6	7	117.8	1.05	0.85	0.19	1.08	12.1	13.2	UnDef	0.09
19.19	45.3	0.31	0.68	-12.6	7	117.8	1.10	0.88	0.22	1.07	14.5	15.4	UnDef	0.10
20.18	107.3	1.30	1.21	-10.5	8	120.9	1.16	0.91	0.26	1.05	25.7	27.0	UnDef	0.29
21.16	95.4	1.14	1.20	-9.9	8	120.9	1.22	0.94	0.29	1.03	22.8	23.6	UnDef	0.24
22.15	83.4	0.72	0.86	-10.6	8	120.9	1.28	0.96	0.32	1.02	20.0	20.3	UnDef	0.17
23.13	46.4	0.62	1.34	-11.0	7	117.8	1.34	0.99	0.35	1.00	14.8	14.9	UnDef	0.13
24.11	9.7	0.07	0.76	-10.3	6	114.6	1.40	1.02	0.38	0.99	3.7	3.7	0.66	0.09
25.10	8.8	0.06	0.64	-9.1	6	114.6	1.45	1.05	0.41	0.98	3.4	3.3	0.59	0.09
26.08	8.2	0.04	0.51	-4.3	6	114.6	1.51	1.07	0.44	0.97	3.2	3.1	0.54	0.09
27.07	7.9	0.02	0.27	1.1	1	79.6	1.56	1.09	0.47	0.96	3.8	3.6	0.51	0.00
28.05	8.8	0.03	0.36	3.0	6	114.6	1.61	1.10	0.50	0.95	3.4	3.2	0.57	0.00
29.04	9.4	0.07	0.73	5.2	6	114.6	1.66	1.13	0.53	0.94	3.6	3.4	0.62	0.09
30.02	11.4	0.25	2.16	13.0	5	114.6	1.72	1.16	0.56	0.93	5.5	5.1	0.77	0.09
31.00	16.8	0.42	2.51	9.0	5	114.6	1.78	1.18	0.59	0.92	8.0	7.4	1.20	0.12
31.99	10.5	0.21	2.01	4.4	5	114.6	1.83	1.21	0.62	0.91	5.0	4.6	0.70	0.09
32.97	20.4	0.63	3.07	11.1	5	114.6	1.89	1.23	0.65	0.90	9.8	8.8	1.48	0.15
33.96	21.5	0.86	3.98	15.8	4	114.6	1.94	1.26	0.69	0.89	13.7	12.2	1.56	0.00
34.94	19.1	0.84	4.42	15.9	3	111.4	2.00	1.28	0.72	0.88	18.3	16.1	1.37	0.00
35.92	19.3	0.82	4.26	17.6	3	111.4	2.05	1.31	0.75	0.87	18.5	16.2	1.38	0.00
36.91	54.7	1.52	2.78	7.2	6	114.6	2.11	1.33	0.78	0.87	21.0	18.2	4.21	0.45
37.89	198.1	0.75	0.38	-17.1	9	124.1	2.17	1.36	0.81	0.86	37.9	32.5	UnDef	0.00
38.88	215.7	1.06	0.49	-16.7	9	124.1	2.23	1.39	0.84	0.85	41.3	35.0	UnDef	0.00
39.86	219.2	0.82	0.38	-10.7	9	124.1	2.29	1.42	0.87	0.84	42.0	35.2	UnDef	0.00
40.85	319.8	2.30	0.72	-5.5	9	124.1	2.35	1.45	0.90	0.83	61.2	50.8	UnDef	0.00

Gregg In Situ, Inc.
Run No: 00-0119-1624-1210
CPT File: 073C03.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
41.83	275.2	3.38	1.23	-0.8	9	124.1	2.41	1.48	0.93	0.82	52.7	43.3	UnDef	0.00
42.81	241.0	1.84	0.76	6.7	9	124.1	2.47	1.51	0.96	0.81	46.2	37.5	UnDef	0.00
43.80	346.9	2.04	0.59	17.0	10	127.3	2.54	1.54	0.99	0.80	55.4	44.6	UnDef	0.00
44.78	267.8	1.65	0.62	26.0	9	124.1	2.60	1.57	1.02	0.80	51.3	40.9	UnDef	0.00

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0119-1624-1210
Job No: 00-073TX
Client: BAGAHI ENGINEERING
Project: CPT Site Investigation
Site: NEPTUNE MARINA
Location: CPT-03
Engineer: K. BAGAHI
CPT Date: 00/17/01
CPT Time: 12:38
CPT File: 073C03.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.66 (ft): 12.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.49	5.0E-03	0.00	1000.0	1.03	9	170.8	0.0	170.8	0.6	50	95.0	1.0	-0.41	0.0	42.7
1.48	5.0E-03	0.00	889.1	1.11	9	152.2	0.0	152.2	1.1	50	94.7	1.0	-0.41	0.0	38.1
2.46	5.0E-03	0.00	1000.0	1.18	9	347.5	0.0	347.5	1.2	50	95.0	1.0	-0.43	0.0	86.9
3.44	5.0E-03	0.00	858.9	1.23	9	343.1	0.0	343.1	1.7	50	95.0	1.0	-0.42	0.0	85.8
4.43	5.0E-03	0.00	646.9	1.24	9	328.1	0.0	328.1	2.4	50	95.0	1.0	-0.39	0.0	80.3
5.41	5.0E-03	0.00	423.2	1.09	9	237.5	0.0	237.5	3.0	48	92.1	1.0	-0.33	0.0	58.1
6.40	5.0E-04	0.00	186.1	1.43	9	113.8	12.4	126.1	8.7	44	71.0	1.0	-0.29	2.4	39.5
7.30	5.0E-06	-0.02	26.2	2.29	6	17.6	68.8	86.4	34.8	UnDef	UnDef	6.0	UnDef	8.6	17.2
8.20	1.0E-07	-0.05	9.3	1.01	6	7.0	28.0	35.0	45.0	UnDef	UnDef	3.0	UnDef	3.4	6.9
9.19	1.0E-07	-0.04	10.4	0.84	6	8.0	32.1	40.2	40.8	UnDef	UnDef	3.0	UnDef	3.9	7.9
10.17	5.0E-05	-0.01	35.4	1.14	7	26.8	24.2	51.1	22.8	38	30.0	6.0	-0.10	4.4	14.9
11.15	5.0E-03	-0.01	75.2	0.37	9	59.0	0.0	59.0	5.0	40	52.2	1.0	-0.08	0.0	14.4
12.14	5.0E-04	-0.01	55.8	0.44	9	45.9	0.0	45.9	5.0	40	44.9	1.0	-0.07	0.0	15.0
13.21	5.0E-03	-0.01	91.6	0.64	9	76.5	8.2	84.7	8.6	42	59.6	1.0	-0.14	1.2	19.9
14.27	5.0E-03	-0.01	122.5	1.05	9	104.3	13.8	118.0	9.4	42	68.5	1.0	-0.21	2.0	27.5
15.26	5.0E-03	-0.01	62.1	0.29	9	54.4	0.0	54.4	5.0	40	49.8	1.0	-0.04	0.0	13.3
16.24	5.0E-04	-0.03	24.4	0.52	7	22.3	18.5	40.8	22.0	34	30.0	1.0	-0.01	2.9	10.2
17.22	5.0E-06	-0.08	9.0	0.74	6	9.0	36.2	45.2	42.8	UnDef	UnDef	3.0	UnDef	4.4	8.9
18.21	5.0E-04	-0.02	43.4	0.43	9	40.3	0.0	40.3	5.0	38	41.2	1.0	-0.04	0.0	13.2
19.19	5.0E-04	-0.01	50.2	0.70	9	47.2	16.6	63.8	14.7	38	45.8	1.0	-0.09	3.0	18.4
20.18	5.0E-03	-0.01	117.0	1.22	9	110.3	20.3	130.5	10.8	42	70.1	1.0	-0.22	2.9	29.9
21.16	5.0E-03	-0.01	100.6	1.22	9	96.4	22.1	118.6	12.0	42	66.2	1.0	-0.21	3.1	26.7
22.15	5.0E-03	-0.01	85.1	0.87	9	83.1	16.1	99.3	11.1	42	62.0	1.0	-0.16	2.3	22.6
23.13	5.0E-04	-0.02	45.3	1.38	7	45.5	35.2	80.8	21.3	38	44.7	1.0	-0.14	5.6	20.4
24.11	5.0E-05	-0.08	8.1	0.89	6	9.4	37.5	46.9	46.8	30	30.0	3.0	0.05	3.7	7.3
25.10	5.0E-05	-0.09	7.1	0.77	6	8.5	33.8	42.3	48.6	30	30.0	3.0	0.07	3.3	6.6
26.08	5.0E-05	-0.09	6.3	0.62	6	7.8	31.2	39.0	49.4	30	30.0	3.0	0.10	3.1	6.1
27.07	1.0E-07	-0.07	5.9	0.34	1	7.4	UnDef	UnDef	100.0	UnDef	UnDef	1.5	UnDef	UnDef	UnDef
28.05	5.0E-05	-0.06	6.5	0.44	1	8.2	UnDef	UnDef	100.0	30	30.0	3.0	0.12	UnDef	UnDef
29.04	5.0E-05	-0.05	6.8	0.89	6	8.6	34.5	43.1	51.0	30	30.0	3.0	0.07	3.4	6.7
30.02	5.0E-06	-0.02	8.4	2.54	4	10.4	41.5	51.8	59.9	UnDef	UnDef	3.0	UnDef	5.1	10.1
31.00	5.0E-06	-0.02	12.7	2.80	4	15.1	60.5	75.6	51.7	UnDef	UnDef	6.0	UnDef	7.4	14.8
31.99	5.0E-06	-0.06	7.2	2.44	4	9.4	37.5	46.9	63.1	UnDef	UnDef	3.0	UnDef	4.6	9.2
32.97	5.0E-06	-0.02	15.0	3.38	4	18.0	71.9	89.9	51.0	UnDef	UnDef	6.0	UnDef	8.8	17.6
33.96	5.0E-07	-0.01	15.5	4.38	1	18.7	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
34.94	5.0E-08	-0.01	13.3	4.94	1	16.5	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
35.92	5.0E-08	-0.01	13.2	4.77	1	16.5	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
36.91	5.0E-05	-0.01	39.5	2.89	6	46.4	111.9	158.2	31.5	38	45.2	6.0	-0.21	14.4	32.5
37.89	5.0E-02	-0.01	144.0	0.38	9	166.2	0.0	166.2	3.4	44	81.8	1.0	-0.14	0.0	32.5
38.88	5.0E-02	-0.01	153.5	0.50	9	179.0	0.0	179.0	4.0	44	84.0	1.0	-0.17	0.0	35.0
39.86	5.0E-02	-0.01	152.6	0.38	9	179.9	0.0	179.9	3.0	44	84.1	1.0	-0.14	0.0	35.2
40.85	5.0E-02	0.00	218.6	0.72	9	259.7	0.0	259.7	3.8	46	94.6	1.0	-0.23	0.0	50.8

Gregg In Situ, Inc.
Run No: 00-0119-1624-1210
CPT File: 073C03.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
41.83	5.0E-02	0.00	184.1	1.24	9	221.2	17.5	238.8	7.8	44	90.0	1.0	-0.27	2.1	45.4
42.81	5.0E-02	0.00	157.7	0.77	9	191.8	4.5	196.3	5.9	44	85.9	1.0	-0.21	0.5	38.1
43.80	5.0E+00	0.00	223.1	0.59	9	273.2	0.0	273.2	2.8	46	95.0	1.0	-0.21	0.0	44.6
44.78	5.0E-02	0.00	168.4	0.62	9	208.9	0.0	208.9	4.4	44	88.4	1.0	-0.19	0.0	40.9

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0119-1624-1215
Job No: 00-073TX
Client: BAGAHI ENGINEERING
Project: CPT Site Investigation
Site: NEPTUNE MARINA
Location: CPT-04
Engineer: K. BAGAHI
CPT Date: 00/17/01
CPT Time: 13:29
CPT File: 073C04.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.66 (ft): 12.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
0.49	120.5	1.08	0.89	-0.2	8	120.9	0.03	0.03	0.00	2.00	28.8	57.7	UnDef	0.00
1.48	52.9	0.96	1.81	-0.4	7	117.8	0.09	0.09	0.00	2.00	16.9	33.8	UnDef	0.00
2.46	43.6	0.53	1.22	-0.8	7	117.8	0.15	0.15	0.00	2.00	13.9	27.8	UnDef	0.13
3.44	35.3	0.29	0.82	-0.5	7	117.8	0.20	0.20	0.00	2.00	11.3	22.5	UnDef	0.11
4.43	140.7	1.38	0.98	-0.2	9	124.1	0.26	0.26	0.00	1.95	27.0	52.5	UnDef	0.00
5.41	161.7	2.02	1.25	-1.6	8	120.9	0.32	0.32	0.00	1.76	38.7	68.0	UnDef	0.00
6.40	215.5	2.18	1.01	-6.5	9	124.1	0.38	0.38	0.00	1.61	41.3	66.6	UnDef	0.00
7.30	207.0	2.95	1.42	-3.7	8	120.9	0.44	0.44	0.00	1.51	49.6	74.7	UnDef	0.00
8.20	185.2	2.19	1.18	-4.1	8	120.9	0.49	0.49	0.00	1.42	44.3	63.1	UnDef	0.00
9.19	80.5	1.46	1.81	-5.6	7	117.8	0.55	0.55	0.00	1.34	25.7	34.5	UnDef	0.29
10.17	8.0	0.13	1.64	-5.5	5	114.6	0.61	0.61	0.00	1.28	3.8	4.9	0.59	0.09
11.15	5.4	0.03	0.59	-4.7	1	79.6	0.66	0.66	0.00	1.23	2.6	3.2	0.38	0.08
12.14	5.5	0.04	0.64	-3.7	1	79.6	0.70	0.69	0.00	1.20	2.6	3.2	0.39	0.08
13.21	5.6	0.02	0.41	-1.3	1	79.6	0.74	0.70	0.04	1.19	2.7	3.2	0.39	0.08
14.27	5.6	0.02	0.39	-0.8	1	79.6	0.78	0.71	0.07	1.19	2.7	3.2	0.39	0.08
15.26	7.0	0.05	0.77	-0.1	1	79.6	0.82	0.72	0.10	1.18	3.3	3.9	0.49	0.09
16.24	26.0	0.09	0.33	0.4	7	117.8	0.87	0.74	0.13	1.16	8.3	9.7	UnDef	0.00
17.22	44.9	0.27	0.60	1.4	7	117.8	0.93	0.76	0.16	1.14	14.3	16.4	UnDef	0.10
18.21	83.2	0.71	0.86	1.3	8	120.9	0.99	0.79	0.19	1.12	19.9	22.4	UnDef	0.18
19.19	81.0	0.76	0.93	1.3	8	120.9	1.05	0.82	0.22	1.10	19.4	21.4	UnDef	0.18
20.18	26.7	0.25	0.92	1.2	7	117.8	1.10	0.85	0.26	1.09	8.5	9.2	UnDef	0.10
21.16	34.5	0.16	0.45	2.0	7	117.8	1.16	0.88	0.29	1.07	11.0	11.8	UnDef	0.08
22.15	39.2	0.18	0.45	2.0	7	117.8	1.22	0.90	0.32	1.05	12.5	13.2	UnDef	0.09
23.13	76.5	0.61	0.80	-0.5	8	120.9	1.28	0.93	0.35	1.04	18.3	19.0	UnDef	0.15
24.11	79.0	0.74	0.94	0.7	8	120.9	1.34	0.96	0.38	1.02	18.9	19.3	UnDef	0.17
25.10	61.7	1.04	1.68	0.8	7	117.8	1.40	0.99	0.41	1.01	19.7	19.8	UnDef	0.18
26.08	8.0	0.13	1.62	2.7	5	114.6	1.45	1.02	0.44	0.99	3.8	3.8	0.52	0.09
27.07	7.2	0.09	1.30	5.1	5	114.6	1.51	1.04	0.47	0.98	3.4	3.4	0.46	0.08
28.05	7.0	0.05	0.65	8.4	1	79.6	1.56	1.06	0.50	0.97	3.3	3.2	0.43	0.08
29.04	6.8	0.05	0.66	12.0	1	79.6	1.60	1.07	0.53	0.97	3.3	3.2	0.42	0.08
30.02	7.5	0.11	1.52	13.1	5	114.6	1.65	1.08	0.56	0.96	3.6	3.4	0.47	0.08
31.00	8.7	0.13	1.54	14.0	5	114.6	1.70	1.11	0.59	0.95	4.2	3.9	0.56	0.09
31.99	10.4	0.21	2.04	17.3	5	114.6	1.76	1.13	0.62	0.94	5.0	4.7	0.69	0.09
32.97	96.5	0.68	0.70	5.1	8	120.9	1.82	1.16	0.65	0.93	23.1	21.4	UnDef	0.18
33.96	155.5	0.52	0.34	-13.4	9	124.1	1.88	1.19	0.69	0.92	29.8	27.3	UnDef	0.33
34.94	31.4	0.39	1.23	-14.0	7	117.8	1.94	1.22	0.72	0.91	10.0	9.1	UnDef	0.13
35.92	22.8	0.29	1.26	-13.9	6	114.6	1.99	1.25	0.75	0.90	8.7	7.8	1.67	0.17
36.91	24.3	0.37	1.54	-13.9	6	114.6	2.05	1.27	0.78	0.89	9.3	8.3	1.78	0.19
37.89	85.3	1.26	1.47	-14.9	7	117.8	2.11	1.30	0.81	0.88	27.2	23.9	UnDef	0.21
38.88	157.3	1.64	1.04	-19.7	9	124.1	2.17	1.33	0.84	0.87	30.1	26.2	UnDef	0.41
39.86	228.6	2.22	0.97	-24.6	9	124.1	2.23	1.36	0.87	0.86	43.8	37.6	UnDef	0.00
40.85	221.2	1.91	0.86	-24.5	9	124.1	2.29	1.39	0.90	0.85	42.4	36.0	UnDef	0.00

Gregg In Situ, Inc.
Run No: 00-0119-1624-1215
CPT File: 073C04.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
41.83	214.8	1.61	0.75	-24.6	9	124.1	2.35	1.42	0.93	0.84	41.1	34.5	UnDef	0.00
42.81	307.1	3.88	1.26	-24.6	9	124.1	2.41	1.45	0.96	0.83	58.8	48.9	UnDef	0.00
43.80	162.3	3.59	2.21	-23.9	7	117.8	2.47	1.48	0.99	0.82	51.8	42.6	UnDef	0.00
44.78	47.6	1.72	3.62	-22.2	5	114.6	2.53	1.50	1.02	0.82	22.8	18.6	3.61	0.00
45.77	53.3	1.92	3.60	-19.3	5	114.6	2.58	1.53	1.05	0.81	25.5	20.6	4.06	0.00
46.75	46.9	1.55	3.31	-19.0	5	114.6	2.64	1.56	1.09	0.80	22.4	18.0	3.54	0.00
47.74	39.3	1.74	4.43	-18.3	4	114.6	2.70	1.58	1.12	0.80	25.1	20.0	2.93	0.00
48.72	33.9	1.26	3.71	-17.3	5	114.6	2.75	1.61	1.15	0.79	16.2	12.8	2.49	0.29
49.70	32.6	1.16	3.56	-16.8	5	114.6	2.81	1.63	1.18	0.78	15.6	12.2	2.38	0.26
50.69	58.6	2.01	3.44	-16.8	5	114.6	2.87	1.66	1.21	0.78	28.0	21.8	4.46	0.00
51.67	55.7	1.76	3.15	-16.9	6	114.6	2.92	1.68	1.24	0.77	21.3	16.4	4.22	0.00
52.66	73.6	2.10	2.85	-16.7	6	114.6	2.98	1.71	1.27	0.76	28.2	21.6	5.65	0.00
53.64	56.2	1.95	3.47	-16.3	5	114.6	3.04	1.74	1.30	0.76	26.9	20.4	4.25	0.00
54.63	65.0	1.95	3.01	-16.9	6	114.6	3.09	1.76	1.33	0.75	24.9	18.8	4.95	0.00
55.61	53.3	1.65	3.09	-17.2	6	114.6	3.15	1.79	1.36	0.75	20.4	15.3	4.02	0.00
56.59	71.1	1.92	2.71	-16.8	6	114.6	3.20	1.81	1.39	0.74	27.2	20.2	5.43	0.00
57.58	152.8	2.51	1.64	-16.8	8	120.9	3.26	1.84	1.42	0.74	36.6	27.0	UnDef	0.46
58.56	206.2	3.53	1.71	-16.1	8	120.9	3.32	1.87	1.45	0.73	49.4	36.1	UnDef	0.00
59.55	177.5	3.12	1.76	-15.3	8	120.9	3.38	1.90	1.48	0.73	42.5	30.9	UnDef	0.00
60.53	148.2	2.64	1.78	-15.5	8	120.9	3.44	1.93	1.52	0.72	35.5	25.6	UnDef	0.00
61.52	147.9	2.69	1.82	-16.2	7	117.8	3.50	1.95	1.55	0.72	47.2	33.8	UnDef	0.00
62.42	172.9	2.88	1.67	-17.0	8	120.9	3.55	1.98	1.57	0.71	41.4	29.4	UnDef	0.00
63.32	90.2	2.21	2.45	-17.1	7	117.8	3.61	2.00	1.60	0.71	28.8	20.3	UnDef	0.00
64.30	82.1	2.71	3.30	-17.0	6	114.6	3.66	2.03	1.63	0.70	31.4	22.1	6.27	0.00
65.29	188.9	3.19	1.69	-15.6	8	120.9	3.72	2.06	1.66	0.70	45.2	31.5	UnDef	0.00
66.27	227.2	4.44	1.95	-13.8	8	120.9	3.78	2.09	1.69	0.69	54.4	37.7	UnDef	0.00
67.26	209.1	4.18	2.00	-13.9	8	120.9	3.84	2.12	1.73	0.69	50.1	34.4	UnDef	0.00
68.24	226.8	4.50	1.98	-13.7	8	120.9	3.90	2.14	1.76	0.68	54.3	37.1	UnDef	0.00
69.22	236.8	5.27	2.23	-11.3	7	117.8	3.96	2.17	1.79	0.68	75.6	51.3	UnDef	0.00

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0119-1624-1215
Job No: 00-073TX
Client: BAGAHI ENGINEERING
Project: CPT Site Investigation
Site: NEPTUNE MARINA
Location: CPT-04
Engineer: K. BAGAHI
CPT Date: 00/17/01
CPT Time: 13:29
CPT File: 073C04.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.66 (ft): 12.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.49	5.0E-03	0.00	1000.0	0.89	10	230.7	0.0	230.7	0.0	50	95.0	1.0	-0.39	0.0	57.7
1.48	5.0E-04	0.00	597.0	1.82	12	101.4	UnDef	UnDef	0.0	50	83.2	1.0	-0.44	UnDef	UnDef
2.46	5.0E-04	0.00	296.4	1.22	9	83.4	0.3	83.7	5.1	46	70.4	1.0	-0.31	0.1	27.9
3.44	5.0E-04	0.00	171.6	0.83	9	67.6	1.4	68.9	5.8	44	59.5	1.0	-0.22	0.3	22.8
4.43	5.0E-02	0.00	532.2	0.98	9	268.1	0.0	268.1	1.8	48	95.0	1.0	-0.34	0.0	52.5
5.41	5.0E-03	0.00	497.6	1.25	9	277.8	0.0	277.8	3.2	48	95.0	1.0	-0.37	0.0	68.0
6.40	5.0E-02	0.00	559.3	1.01	9	340.0	0.0	340.0	1.8	50	95.0	1.0	-0.35	0.0	66.6
7.30	5.0E-03	0.00	469.6	1.43	9	305.4	0.0	305.4	4.2	48	95.0	1.0	-0.38	0.0	74.7
8.20	5.0E-03	0.00	373.6	1.19	9	257.8	0.0	257.8	4.0	48	94.4	1.0	-0.33	0.0	63.1
9.19	5.0E-04	0.00	144.5	1.83	9	105.9	25.9	131.8	12.4	44	68.9	1.0	-0.29	4.8	39.4
10.17	5.0E-06	-0.02	12.0	1.78	6	10.0	39.8	49.8	46.3	UnDef	UnDef	3.0	UnDef	4.9	9.7
11.15	1.0E-07	-0.03	7.2	0.67	6	6.5	25.9	32.4	47.0	UnDef	UnDef	3.0	UnDef	3.2	6.3
12.14	1.0E-07	-0.02	7.0	0.73	6	6.5	26.0	32.4	48.4	UnDef	UnDef	3.0	UnDef	3.2	6.4
13.21	1.0E-07	-0.02	7.0	0.47	6	6.6	26.3	32.9	44.5	UnDef	UnDef	3.0	UnDef	3.2	6.4
14.27	1.0E-07	-0.02	6.8	0.45	6	6.5	26.1	32.7	44.7	UnDef	UnDef	3.0	UnDef	3.2	6.4
15.26	1.0E-07	-0.02	8.6	0.87	6	8.1	32.2	40.3	45.4	UnDef	UnDef	3.0	UnDef	3.9	7.9
16.24	5.0E-04	0.00	34.1	0.35	9	29.7	0.0	29.7	5.0	36	32.5	1.0	0.00	0.0	9.7
17.22	5.0E-04	0.00	57.4	0.62	9	50.2	12.8	62.9	12.6	40	47.5	1.0	-0.09	2.4	18.8
18.21	5.0E-03	0.00	103.7	0.87	9	91.4	12.2	103.7	9.4	42	64.7	1.0	-0.18	1.8	24.2
19.19	5.0E-03	0.00	97.3	0.95	9	87.4	15.0	102.5	10.5	42	63.4	1.0	-0.18	2.2	23.6
20.18	5.0E-04	-0.01	30.1	0.96	7	28.3	27.7	56.0	23.5	36	31.1	1.0	-0.07	4.1	13.4
21.16	5.0E-04	-0.01	38.1	0.47	9	36.1	0.0	36.1	5.0	38	38.1	1.0	-0.04	0.0	11.8
22.15	5.0E-04	-0.01	42.0	0.47	9	40.3	0.0	40.3	5.0	38	41.2	1.0	-0.04	0.0	13.2
23.13	5.0E-03	0.00	80.7	0.81	9	77.5	15.0	92.5	11.1	42	60.0	1.0	-0.15	2.1	21.1
24.11	5.0E-03	0.00	80.8	0.96	9	78.8	18.7	97.5	12.2	42	60.5	1.0	-0.16	2.6	21.9
25.10	5.0E-04	-0.01	61.0	1.72	7	60.7	40.1	100.8	19.9	40	53.0	1.0	-0.19	6.6	26.4
26.08	5.0E-06	-0.05	6.4	1.98	4	7.7	30.9	38.7	62.9	UnDef	UnDef	3.0	UnDef	3.8	7.6
27.07	5.0E-06	-0.05	5.5	1.64	4	6.9	27.6	34.5	64.5	UnDef	UnDef	1.5	UnDef	3.4	6.8
28.05	1.0E-07	-0.04	5.1	0.83	6	6.6	26.6	33.2	57.6	UnDef	UnDef	1.5	UnDef	3.2	6.5
29.04	1.0E-07	-0.03	4.9	0.86	4	6.5	25.8	32.3	59.2	UnDef	UnDef	1.5	UnDef	3.2	6.3
30.02	5.0E-06	-0.03	5.4	1.95	4	7.0	28.1	35.2	67.5	UnDef	UnDef	1.5	UnDef	3.4	6.9
31.00	5.0E-06	-0.02	6.3	1.92	4	8.1	32.2	40.3	63.0	UnDef	UnDef	3.0	UnDef	3.9	7.9
31.99	5.0E-06	-0.01	7.6	2.45	4	9.6	38.2	47.8	61.8	UnDef	UnDef	3.0	UnDef	4.7	9.4
32.97	5.0E-03	-0.01	81.5	0.72	9	87.6	14.3	101.9	10.3	42	63.5	1.0	-0.14	2.1	23.5
33.96	5.0E-02	-0.01	129.0	0.34	9	139.5	0.0	139.5	3.6	44	76.8	1.0	-0.12	0.0	27.3
34.94	5.0E-04	-0.04	24.1	1.32	7	27.8	54.5	82.3	29.8	34	30.6	1.0	-0.08	6.4	15.5
35.92	5.0E-05	-0.06	16.7	1.38	6	20.0	80.1	100.1	36.6	32	30.0	6.0	-0.05	7.8	15.7
36.91	5.0E-05	-0.05	17.5	1.68	6	21.1	84.5	105.6	38.1	32	30.0	6.0	-0.07	8.3	16.5
37.89	5.0E-04	-0.02	64.0	1.51	7	73.2	39.5	112.7	18.1	40	58.3	1.0	-0.19	6.7	30.6
38.88	5.0E-02	-0.01	116.9	1.06	9	133.6	19.7	153.3	9.8	42	75.6	1.0	-0.21	2.3	28.4
39.86	5.0E-02	-0.01	166.7	0.98	9	192.0	10.1	202.2	6.9	44	86.0	1.0	-0.23	1.2	38.8
40.85	5.0E-02	-0.01	157.7	0.87	9	183.7	7.9	191.6	6.5	44	84.7	1.0	-0.22	1.0	36.9

Gregg In Situ, Inc.
Run No: 00-0119-1624-1215
CPT File: 073C04.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
41.83	5.0E-02	-0.01	149.8	0.76	9	176.5	5.3	181.8	6.1	44	83.6	1.0	-0.20	0.6	35.2
42.81	5.0E-02	-0.01	210.3	1.27	9	249.7	15.1	264.8	7.1	46	93.5	1.0	-0.28	1.8	50.7
43.80	5.0E-04	-0.01	108.2	2.25	7	130.7	59.3	190.0	16.7	42	74.9	1.0	-0.29	10.3	53.0
44.78	5.0E-06	-0.04	30.0	3.82	6	38.0	152.0	190.0	39.8	UnDef	UnDef	6.0	UnDef	18.6	37.2
45.77	5.0E-06	-0.03	33.1	3.79	6	42.2	168.7	210.8	38.0	UnDef	UnDef	6.0	UnDef	20.6	41.3
46.75	5.0E-06	-0.04	28.4	3.51	6	36.8	147.1	183.8	39.4	UnDef	UnDef	6.0	UnDef	18.0	36.0
47.74	5.0E-07	-0.05	23.2	4.76	1	30.6	UnDef	UnDef	100.0	UnDef	UnDef	6.0	UnDef	UnDef	UnDef
48.72	5.0E-06	-0.05	19.4	4.04	4	26.2	104.8	131.0	48.7	UnDef	UnDef	6.0	UnDef	12.8	25.6
49.70	5.0E-06	-0.06	18.3	3.89	4	25.0	99.9	124.9	49.3	UnDef	UnDef	6.0	UnDef	12.2	24.4
50.69	5.0E-06	-0.03	33.6	3.62	6	44.5	178.0	222.5	37.1	UnDef	UnDef	6.0	UnDef	21.8	43.6
51.67	5.0E-05	-0.03	31.3	3.33	6	42.0	167.9	209.9	37.0	36	42.4	6.0	-0.21	16.4	32.9
52.66	5.0E-05	-0.03	41.3	2.97	6	55.1	127.5	182.6	31.2	38	50.2	6.0	-0.23	16.7	38.3
53.64	5.0E-06	-0.03	30.6	3.67	6	41.7	167.0	208.7	38.8	UnDef	UnDef	6.0	UnDef	20.4	40.9
54.63	5.0E-05	-0.03	35.2	3.16	6	48.0	174.9	222.8	34.4	38	46.2	6.0	-0.22	18.1	36.9
55.61	5.0E-05	-0.04	28.1	3.29	6	39.1	156.2	195.3	38.6	36	40.3	6.0	-0.20	15.3	30.6
56.59	5.0E-05	-0.03	37.5	2.83	6	51.7	133.0	184.6	32.0	38	48.3	6.0	-0.21	16.6	36.8
57.58	5.0E-03	-0.01	81.3	1.68	7	110.2	49.5	159.8	16.6	42	70.1	1.0	-0.22	6.5	33.5
58.56	5.0E-03	-0.01	108.6	1.74	7	147.6	48.5	196.1	14.3	42	78.4	1.0	-0.26	6.6	42.7
59.55	5.0E-03	-0.01	91.8	1.79	7	126.1	52.8	178.9	16.0	42	73.9	1.0	-0.24	7.0	37.8
60.53	5.0E-03	-0.01	75.1	1.82	7	104.5	56.8	161.3	18.2	40	68.5	1.0	-0.22	7.2	32.8
61.52	5.0E-04	-0.01	73.9	1.86	7	103.5	58.8	162.3	18.6	40	68.3	1.0	-0.22	9.9	43.7
62.42	5.0E-03	-0.01	85.6	1.70	7	120.3	51.6	171.9	16.2	42	72.6	1.0	-0.23	6.8	36.2
63.32	5.0E-04	-0.02	43.2	2.55	7	62.3	105.8	168.1	28.6	38	53.7	1.0	-0.21	13.2	33.5
64.30	5.0E-05	-0.03	38.6	3.45	6	56.4	199.9	256.2	34.2	38	50.8	6.0	-0.25	21.0	43.1
65.29	5.0E-03	-0.01	89.9	1.72	7	128.8	52.8	181.6	15.9	42	74.5	1.0	-0.24	7.0	38.5
66.27	5.0E-03	-0.01	107.0	1.99	7	153.9	60.7	214.6	15.6	42	79.6	1.0	-0.27	8.1	45.7
67.26	5.0E-03	-0.01	97.0	2.04	7	140.7	64.2	204.9	16.7	42	77.1	1.0	-0.26	8.4	42.8
68.24	5.0E-03	-0.01	103.9	2.02	7	151.5	63.1	214.6	16.0	42	79.2	1.0	-0.27	8.4	45.4
69.22	5.0E-04	-0.01	107.2	2.26	7	157.2	72.8	230.0	16.9	42	80.2	1.0	-0.29	12.7	63.9

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0119-1624-1221
Job No: 00-073TX
Client: BAGAHI ENGINEERING
Project: CPT Site Investigation
Site: NEPTUNE MARINA
Location: CPT-05
Engineer: K. BAGAHI
CPT Date: 00/17/01
CPT Time: 14:32
CPT File: 073C05.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.66 (ft): 12.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
0.49	117.7	0.70	0.59	-0.1	9	124.1	0.03	0.03	0.00	2.00	22.5	45.1	UnDef	0.00
1.48	86.0	0.90	1.05	-0.8	8	120.9	0.09	0.09	0.00	2.00	20.6	41.2	UnDef	0.00
2.46	84.2	1.01	1.20	-1.1	8	120.9	0.15	0.15	0.00	2.00	20.1	40.3	UnDef	0.00
3.44	123.7	1.10	0.89	-1.3	8	120.9	0.21	0.21	0.00	2.00	29.6	59.2	UnDef	0.00
4.43	116.1	1.14	0.98	-1.5	8	120.9	0.27	0.27	0.00	1.93	27.8	53.6	UnDef	0.00
5.41	74.5	1.05	1.41	-2.1	7	117.8	0.33	0.33	0.00	1.75	23.8	41.5	UnDef	0.31
6.40	111.4	0.99	0.89	-3.2	8	120.9	0.39	0.39	0.00	1.61	26.7	42.9	UnDef	0.00
7.30	103.1	1.23	1.19	-3.1	8	120.9	0.44	0.44	0.00	1.51	24.7	37.1	UnDef	0.44
8.20	81.6	1.10	1.34	-3.2	8	120.9	0.50	0.50	0.00	1.42	19.5	27.7	UnDef	0.27
9.19	48.9	0.79	1.61	-3.9	7	117.8	0.55	0.55	0.00	1.34	15.6	21.0	UnDef	0.15
10.17	6.6	0.10	1.50	-3.5	5	114.6	0.61	0.61	0.00	1.28	3.1	4.0	0.48	0.09
11.15	7.7	0.03	0.37	-1.3	1	79.6	0.66	0.66	0.00	1.23	3.7	4.5	0.56	0.00
12.14	12.2	0.04	0.35	0.0	6	114.6	0.71	0.70	0.00	1.19	4.7	5.6	0.92	0.00
13.21	11.5	0.04	0.31	1.0	6	114.6	0.77	0.73	0.04	1.17	4.4	5.2	0.86	0.00
14.27	27.5	0.10	0.35	0.9	7	117.8	0.83	0.76	0.07	1.15	8.8	10.1	UnDef	0.08
15.26	44.9	0.32	0.72	0.7	7	117.8	0.89	0.79	0.10	1.13	14.3	16.2	UnDef	0.11
16.24	20.4	0.16	0.76	0.2	6	114.6	0.95	0.81	0.13	1.11	7.8	8.7	1.56	0.09
17.22	30.7	0.10	0.32	0.2	7	117.8	1.00	0.84	0.16	1.09	9.8	10.7	UnDef	0.08
18.21	62.3	0.38	0.60	0.5	8	120.9	1.06	0.87	0.19	1.07	14.9	16.0	UnDef	0.12
19.19	89.3	0.53	0.60	-0.4	8	120.9	1.12	0.90	0.22	1.06	21.4	22.6	UnDef	0.17
20.18	31.3	0.19	0.62	-0.4	7	117.8	1.18	0.92	0.26	1.04	10.0	10.4	UnDef	0.09
21.16	36.9	0.15	0.41	0.0	7	117.8	1.24	0.95	0.29	1.03	11.8	12.1	UnDef	0.08
22.15	150.2	1.60	1.06	-0.3	8	120.9	1.30	0.98	0.32	1.01	36.0	36.3	UnDef	0.00
23.13	187.5	2.71	1.44	0.2	8	120.9	1.36	1.01	0.35	1.00	44.9	44.7	UnDef	0.00
24.11	206.7	3.22	1.56	0.3	8	120.9	1.42	1.04	0.38	0.98	49.5	48.6	UnDef	0.00
25.10	228.1	3.34	1.47	-0.5	8	120.9	1.47	1.07	0.41	0.97	54.6	52.9	UnDef	0.00
26.08	226.7	2.56	1.13	-0.5	9	124.1	1.54	1.10	0.44	0.96	43.4	41.5	UnDef	0.00
27.07	124.0	1.54	1.24	-0.6	8	120.9	1.60	1.13	0.47	0.94	29.7	28.0	UnDef	0.33
28.05	52.6	0.60	1.15	-1.3	7	117.8	1.65	1.15	0.50	0.93	16.8	15.6	UnDef	0.13
29.04	26.0	0.24	0.91	-0.5	7	117.8	1.71	1.18	0.53	0.92	8.3	7.6	UnDef	0.11
30.02	19.0	0.12	0.64	0.3	6	114.6	1.77	1.21	0.56	0.91	7.3	6.6	1.38	0.11
31.00	12.7	0.08	0.66	2.4	6	114.6	1.83	1.23	0.59	0.90	4.9	4.4	0.87	0.10
31.99	16.8	0.14	0.83	6.3	6	114.6	1.88	1.26	0.62	0.89	6.4	5.7	1.20	0.12
32.97	22.5	0.57	2.52	7.5	5	114.6	1.94	1.28	0.65	0.88	10.8	9.5	1.64	0.16
33.96	30.0	1.00	3.32	7.9	5	114.6	1.99	1.31	0.69	0.87	14.3	12.5	2.24	0.28
34.94	29.3	1.09	3.72	8.6	5	114.6	2.05	1.34	0.72	0.87	14.0	12.2	2.18	0.26
35.92	44.3	1.13	2.55	9.6	6	114.6	2.11	1.36	0.75	0.86	17.0	14.5	3.37	0.00
36.91	211.4	1.12	0.53	4.2	9	124.1	2.17	1.39	0.78	0.85	40.5	34.4	UnDef	0.00
37.89	254.1	1.83	0.72	-12.1	9	124.1	2.23	1.42	0.81	0.84	48.7	40.9	UnDef	0.00
38.88	382.1	1.97	0.52	-21.5	10	127.3	2.29	1.45	0.84	0.83	61.0	50.7	UnDef	0.00
39.86	400.6	2.84	0.71	-25.7	10	127.3	2.35	1.48	0.87	0.82	63.9	52.5	UnDef	0.00
40.85	337.3	3.37	1.00	-26.5	9	124.1	2.41	1.51	0.90	0.81	64.6	52.5	UnDef	0.00

Gregg In Situ, Inc.
Run No: 00-0119-1624-1221
CPT File: 073C05.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
41.83	215.2	1.43	0.66	-27.2	9	124.1	2.48	1.54	0.93	0.80	41.2	33.2	UnDef	0.00
42.81	309.1	2.04	0.66	-25.2	9	124.1	2.54	1.57	0.96	0.80	59.2	47.2	UnDef	0.00
43.80	320.9	2.44	0.76	-23.8	9	124.1	2.60	1.60	0.99	0.79	61.5	48.5	UnDef	0.00
44.78	300.7	2.03	0.67	-21.6	9	124.1	2.66	1.63	1.02	0.78	57.6	45.1	UnDef	0.00
45.77	203.6	1.04	0.51	-16.5	9	124.1	2.72	1.67	1.05	0.78	39.0	30.2	UnDef	0.44
46.75	198.9	1.65	0.83	-15.7	9	124.1	2.78	1.70	1.09	0.77	38.1	29.3	UnDef	0.00
47.74	331.2	3.75	1.13	-14.5	9	124.1	2.84	1.73	1.12	0.76	63.4	48.3	UnDef	0.00
48.72	353.3	2.30	0.65	-9.8	10	127.3	2.90	1.76	1.15	0.75	56.4	42.5	UnDef	0.00
49.70	375.8	3.08	0.82	-8.7	9	124.1	2.97	1.79	1.18	0.75	72.0	53.8	UnDef	0.00
50.69	408.0	2.56	0.63	-9.0	10	127.3	3.03	1.82	1.21	0.74	65.1	48.3	UnDef	0.00

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0119-1624-1221
Job No: 00-073TX
Client: BAGAHI ENGINEERING
Project: CPT Site Investigation
Site: NEPTUNE MARINA
Location: CPT-05
Engineer: K. BAGAHI
CPT Date: 00/17/01
CPT Time: 14:32
CPT File: 073C05.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.66 (ft): 12.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.49	5.0E-02	0.00	1000.0	0.59	10	225.4	0.0	225.4	0.0	50	95.0	1.0	-0.35	0.0	45.1
1.48	5.0E-03	0.00	945.7	1.05	9	164.7	0.0	164.7	0.8	50	95.0	1.0	-0.41	0.0	41.2
2.46	5.0E-03	0.00	558.7	1.20	9	161.2	0.0	161.2	2.6	50	88.9	1.0	-0.37	0.0	40.3
3.44	5.0E-03	0.00	588.3	0.89	9	236.9	0.0	236.9	1.1	50	95.0	1.0	-0.34	0.0	59.2
4.43	5.0E-03	0.00	430.0	0.99	9	218.9	0.0	218.9	2.5	48	89.7	1.0	-0.32	0.0	53.6
5.41	5.0E-04	0.00	225.9	1.42	9	127.2	8.9	136.1	7.5	46	74.2	1.0	-0.30	1.8	43.3
6.40	5.0E-03	0.00	286.9	0.90	9	175.2	0.0	175.2	3.6	46	83.4	1.0	-0.28	0.0	42.9
7.30	5.0E-03	0.00	232.5	1.20	9	151.8	5.0	156.8	6.2	46	79.2	1.0	-0.29	0.8	37.9
8.20	5.0E-03	0.00	163.5	1.35	9	113.4	14.0	127.3	9.1	44	70.9	1.0	-0.27	2.0	29.8
9.19	5.0E-04	0.00	87.2	1.63	7	64.3	25.6	89.9	15.7	42	54.6	1.0	-0.22	4.5	25.5
10.17	5.0E-06	-0.02	9.7	1.66	6	8.2	32.8	41.1	50.1	UnDef	UnDef	3.0	UnDef	4.0	8.0
11.15	1.0E-07	-0.01	10.7	0.40	7	9.3	0.0	9.3	5.0	UnDef	UnDef	3.0	UnDef	0.0	4.5
12.14	5.0E-05	0.00	16.4	0.38	7	14.3	0.0	14.3	5.0	32	30.0	6.0	0.05	0.0	5.6
13.21	5.0E-05	0.00	14.7	0.33	7	13.2	0.0	13.2	5.0	32	30.0	6.0	0.07	0.0	5.2
14.27	5.0E-04	0.00	35.1	0.36	9	30.9	0.0	30.9	5.0	38	33.6	1.0	-0.01	0.0	10.1
15.26	5.0E-04	0.00	55.9	0.73	9	49.5	15.5	65.0	13.9	40	47.1	1.0	-0.11	2.8	19.0
16.24	5.0E-05	-0.01	24.0	0.80	7	22.2	26.3	48.4	25.3	34	30.0	6.0	-0.04	4.5	13.1
17.22	5.0E-04	-0.01	35.4	0.33	9	32.8	0.0	32.8	5.0	38	35.4	1.0	0.00	0.0	10.7
18.21	5.0E-03	0.00	70.6	0.61	9	65.5	11.5	77.0	10.6	40	55.1	1.0	-0.11	1.7	17.7
19.19	5.0E-03	0.00	98.3	0.61	9	92.3	7.5	99.8	7.8	42	65.0	1.0	-0.14	1.1	23.7
20.18	5.0E-04	-0.01	32.6	0.64	7	31.9	19.8	51.7	19.4	36	34.5	1.0	-0.05	3.3	13.7
21.16	5.0E-04	-0.01	37.5	0.42	9	37.0	0.0	37.0	5.0	38	38.8	1.0	-0.03	0.0	12.1
22.15	5.0E-03	0.00	152.0	1.07	9	148.5	13.0	161.5	8.0	44	78.6	1.0	-0.23	1.9	38.3
23.13	5.0E-03	0.00	184.5	1.45	9	182.7	20.9	203.6	8.8	44	84.5	1.0	-0.29	3.1	47.8
24.11	5.0E-03	0.00	197.9	1.57	9	198.6	23.5	222.2	9.0	46	86.9	1.0	-0.30	3.5	52.0
25.10	5.0E-03	0.00	212.6	1.48	9	216.2	19.5	235.6	8.1	46	89.4	1.0	-0.30	2.9	55.8
26.08	5.0E-02	0.00	205.5	1.14	9	212.0	9.1	221.1	6.5	46	88.8	1.0	-0.27	1.1	42.6
27.07	5.0E-03	0.00	108.8	1.26	9	114.4	24.4	138.8	11.6	42	71.1	1.0	-0.22	3.5	31.5
28.05	5.0E-04	-0.01	44.1	1.18	7	47.9	32.9	80.8	20.3	38	46.2	1.0	-0.13	5.3	21.0
29.04	5.0E-04	-0.02	20.6	0.98	7	23.4	44.1	67.6	29.5	34	30.0	1.0	-0.04	5.3	12.9
30.02	5.0E-05	-0.03	14.3	0.71	7	16.9	50.3	67.2	33.0	32	30.0	6.0	0.02	5.8	12.4
31.00	5.0E-05	-0.05	8.9	0.77	6	11.2	44.9	56.1	43.4	30	30.0	3.0	0.06	4.4	8.8
31.99	5.0E-05	-0.03	11.9	0.94	6	14.7	58.7	73.4	39.2	30	30.0	3.0	0.02	5.7	11.5
32.97	5.0E-06	-0.02	16.0	2.76	6	19.4	77.6	97.0	46.5	UnDef	UnDef	6.0	UnDef	9.5	19.0
33.96	5.0E-06	-0.02	21.4	3.56	6	25.6	102.5	128.1	44.8	UnDef	UnDef	6.0	UnDef	12.5	25.1
34.94	5.0E-06	-0.02	20.4	4.00	4	24.8	99.3	124.2	47.5	UnDef	UnDef	6.0	UnDef	12.2	24.3
35.92	5.0E-05	-0.01	31.0	2.68	6	37.1	130.9	168.1	34.2	36	38.9	6.0	-0.17	13.8	28.4
36.91	5.0E-02	0.00	150.7	0.53	9	175.6	0.0	175.6	4.4	44	83.4	1.0	-0.17	0.0	34.4
37.89	5.0E-02	0.00	177.5	0.73	9	208.8	0.0	208.8	4.9	44	88.4	1.0	-0.21	0.0	40.9
38.88	5.0E+00	0.00	261.9	0.52	9	310.5	0.0	310.5	1.6	46	95.0	1.0	-0.22	0.0	50.7
39.86	5.0E+00	0.00	268.7	0.71	9	322.0	0.0	322.0	2.8	46	95.0	1.0	-0.25	0.0	52.5
40.85	5.0E-02	-0.01	221.3	1.01	9	268.3	3.0	271.4	5.4	46	95.0	1.0	-0.26	0.4	52.9

Gregg In Situ, Inc.
Run No: 00-0119-1624-1221
CPT File: 073C05.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
41.83	5.0E-02	-0.01	137.8	0.67	9	169.5	4.6	174.1	6.0	44	82.4	1.0	-0.18	0.6	33.7
42.81	5.0E-02	-0.01	194.8	0.66	9	241.1	0.0	241.1	4.0	44	92.5	1.0	-0.21	0.0	47.2
43.80	5.0E-02	-0.01	198.4	0.77	9	247.9	0.0	247.9	4.5	46	93.3	1.0	-0.23	0.0	48.5
44.78	5.0E-02	-0.01	182.3	0.68	9	230.2	0.0	230.2	4.4	44	91.2	1.0	-0.21	0.0	45.1
45.77	5.0E-02	-0.01	120.6	0.52	9	154.4	2.7	157.0	5.6	42	79.7	1.0	-0.15	0.3	30.5
46.75	5.0E-02	-0.01	115.7	0.84	9	149.5	15.0	164.4	8.4	42	78.8	1.0	-0.19	1.8	31.0
47.74	5.0E-02	0.00	190.3	1.14	9	246.7	14.0	260.7	7.0	44	93.2	1.0	-0.26	1.7	50.0
48.72	5.0E+00	0.00	199.4	0.66	9	260.8	0.0	260.8	3.8	46	94.8	1.0	-0.21	0.0	42.5
49.70	5.0E-02	0.00	208.5	0.83	9	275.0	0.0	275.0	4.7	46	95.0	1.0	-0.24	0.0	53.8
50.69	5.0E+00	0.00	222.6	0.63	9	296.0	0.0	296.0	3.1	46	95.0	1.0	-0.22	0.0	48.3

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0119-1624-1193
Job No: 00-073TX
Client: BAGAHI ENGINEERING
Project: CPT Site Investigation
Site: NEPTUNE MARINA
Location: CPT-06
Engineer: K. BAGAHI
CPT Date: 00/17/01
CPT Time: 16:03
CPT File: 073C06.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.66 (ft): 12.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
0.49	171.6	0.72	0.42	1.4	9	124.1	0.03	0.03	0.00	2.00	32.9	65.7	UnDef	0.00
1.48	117.7	1.20	1.02	-0.1	8	120.9	0.09	0.09	0.00	2.00	28.2	56.4	UnDef	0.00
2.46	145.0	1.35	0.93	-2.2	9	124.1	0.15	0.15	0.00	2.00	27.8	55.5	UnDef	0.00
3.44	133.0	1.59	1.20	-3.4	8	120.9	0.21	0.21	0.00	2.00	31.9	63.7	UnDef	0.00
4.43	114.6	1.47	1.28	-4.3	8	120.9	0.27	0.27	0.00	1.92	27.4	52.7	UnDef	0.00
5.41	110.9	1.00	0.90	-5.2	8	120.9	0.33	0.33	0.00	1.74	26.6	46.2	UnDef	0.00
6.40	122.8	1.04	0.85	-5.9	8	120.9	0.39	0.39	0.00	1.60	29.4	47.1	UnDef	0.00
7.30	165.8	1.45	0.87	-5.6	9	124.1	0.45	0.45	0.00	1.50	31.7	47.6	UnDef	0.00
8.20	136.6	1.43	1.05	-5.6	8	120.9	0.50	0.50	0.00	1.41	32.7	46.2	UnDef	0.00
9.19	113.1	1.08	0.95	-6.1	8	120.9	0.56	0.56	0.00	1.34	27.1	36.2	UnDef	0.40
10.17	73.3	0.77	1.05	-5.6	8	120.9	0.62	0.62	0.00	1.27	17.6	22.3	UnDef	0.19
11.15	22.0	0.37	1.66	-5.8	6	114.6	0.68	0.68	0.00	1.22	8.4	10.2	1.70	0.11
12.14	39.5	0.25	0.63	-4.9	7	117.8	0.73	0.73	0.00	1.17	12.6	14.8	UnDef	0.10
13.21	15.6	0.37	2.36	-1.7	5	114.6	0.80	0.76	0.04	1.15	7.5	8.6	1.18	0.14
14.27	7.5	0.03	0.35	-0.4	1	79.6	0.85	0.78	0.07	1.13	3.6	4.1	0.53	0.09
15.26	8.7	0.05	0.61	-0.4	6	114.6	0.90	0.80	0.10	1.12	3.3	3.7	0.63	0.09
16.24	7.0	0.05	0.64	1.5	1	79.6	0.94	0.81	0.13	1.11	3.4	3.7	0.49	0.09
17.22	27.9	0.25	0.90	2.4	7	117.8	0.99	0.83	0.16	1.10	8.9	9.8	UnDef	0.10
18.21	90.1	0.69	0.77	2.9	8	120.9	1.05	0.86	0.19	1.08	21.6	23.3	UnDef	0.19
19.19	75.4	0.88	1.17	2.6	8	120.9	1.11	0.89	0.22	1.06	18.1	19.2	UnDef	0.18
20.18	61.3	0.54	0.89	3.0	8	120.9	1.17	0.92	0.26	1.05	14.7	15.3	UnDef	0.13
21.16	45.6	0.22	0.49	2.9	8	120.9	1.23	0.94	0.29	1.03	10.9	11.2	UnDef	0.10
22.15	83.3	0.61	0.74	3.0	8	120.9	1.29	0.97	0.32	1.01	20.0	20.2	UnDef	0.16
23.13	81.5	0.98	1.20	2.6	8	120.9	1.35	1.00	0.35	1.00	19.5	19.5	UnDef	0.19
24.11	56.5	0.38	0.68	0.6	8	120.9	1.41	1.03	0.38	0.99	13.5	13.3	UnDef	0.11
25.10	125.1	1.13	0.90	-0.8	8	120.9	1.47	1.06	0.41	0.97	30.0	29.1	UnDef	0.30
26.08	196.9	2.38	1.21	-1.5	8	120.9	1.53	1.09	0.44	0.96	47.1	45.2	UnDef	0.00
27.07	199.2	2.83	1.42	-1.6	8	120.9	1.59	1.12	0.47	0.95	47.7	45.1	UnDef	0.00
28.05	192.7	2.44	1.27	-1.6	8	120.9	1.65	1.15	0.50	0.93	46.1	43.1	UnDef	0.00
29.04	202.7	2.63	1.30	-1.8	8	120.9	1.71	1.17	0.53	0.92	48.5	44.8	UnDef	0.00
30.02	205.2	2.76	1.34	-1.7	8	120.9	1.77	1.20	0.56	0.91	49.1	44.8	UnDef	0.00
31.00	132.7	1.00	0.76	-1.2	9	124.1	1.83	1.23	0.59	0.90	25.4	22.9	UnDef	0.28
31.99	34.7	0.09	0.27	-1.9	7	117.8	1.89	1.26	0.62	0.89	11.1	9.9	UnDef	0.08
32.97	14.1	0.15	1.05	0.0	6	114.6	1.94	1.29	0.65	0.88	5.4	4.7	0.97	0.10
33.96	20.3	0.19	0.91	1.3	6	114.6	2.00	1.31	0.69	0.87	7.8	6.8	1.47	0.14
34.94	15.7	0.15	0.95	2.7	6	114.6	2.06	1.34	0.72	0.86	6.0	5.2	1.09	0.11
35.92	26.7	0.48	1.80	7.6	6	114.6	2.11	1.37	0.75	0.86	10.2	8.8	1.97	0.21
36.91	48.1	1.02	2.13	8.6	6	114.6	2.17	1.39	0.78	0.85	18.4	15.6	3.67	0.28
37.89	94.2	1.28	1.36	8.1	8	120.9	2.23	1.42	0.81	0.84	22.6	18.9	UnDef	0.22
38.88	200.5	1.46	0.73	5.6	9	124.1	2.29	1.45	0.84	0.83	38.4	31.9	UnDef	0.00
39.86	209.7	1.68	0.80	0.8	9	124.1	2.35	1.48	0.87	0.82	40.2	33.0	UnDef	0.00
40.85	226.1	1.29	0.57	-6.7	9	124.1	2.41	1.51	0.90	0.81	43.3	35.3	UnDef	0.00

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0119-1624-1193
Job No: 00-073TX
Client: BAGAHI ENGINEERING
Project: CPT Site Investigation
Site: NEPTUNE MARINA
Location: CPT-06
Engineer: K. BAGAHI
CPT Date: 00/17/01
CPT Time: 16:03
CPT File: 073C06.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 3.66 (ft): 12.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.49	5.0E-02	0.00	1000.0	0.42	10	328.7	0.0	328.7	0.0	50	95.0	1.0	-0.31	0.0	65.7
1.48	5.0E-03	0.00	1000.0	1.02	10	225.5	0.0	225.5	0.6	50	95.0	1.0	-0.41	0.0	56.4
2.46	5.0E-02	0.00	958.1	0.93	10	277.6	0.0	277.6	0.3	50	95.0	1.0	-0.39	0.0	55.5
3.44	5.0E-03	0.00	628.2	1.20	9	254.8	0.0	254.8	2.3	50	95.0	1.0	-0.38	0.0	63.7
4.43	5.0E-03	0.00	422.1	1.28	9	215.5	0.0	215.5	3.9	48	89.3	1.0	-0.35	0.0	52.7
5.41	5.0E-03	0.00	334.5	0.91	9	188.8	0.0	188.8	3.0	48	85.5	1.0	-0.29	0.0	46.2
6.40	5.0E-03	0.00	313.9	0.85	9	192.5	0.0	192.5	2.9	46	86.0	1.0	-0.28	0.0	47.1
7.30	5.0E-02	0.00	371.3	0.88	9	243.1	0.0	243.1	2.4	48	92.7	1.0	-0.30	0.0	47.6
8.20	5.0E-03	0.00	271.9	1.05	9	188.9	0.0	188.9	4.6	46	85.5	1.0	-0.29	0.0	46.2
9.19	5.0E-03	0.00	200.9	0.96	9	147.9	2.6	150.5	5.7	46	78.5	1.0	-0.25	0.4	36.6
10.17	5.0E-03	0.00	117.4	1.06	9	91.2	13.3	104.5	9.8	42	64.6	1.0	-0.21	1.9	24.2
11.15	5.0E-05	-0.01	31.4	1.72	7	26.1	44.2	70.3	28.5	36	30.0	6.0	-0.12	6.6	16.9
12.14	5.0E-04	0.00	53.1	0.64	9	45.3	13.5	58.8	13.6	40	44.6	1.0	-0.09	2.5	17.3
13.21	5.0E-06	-0.01	19.5	2.49	6	17.5	70.1	87.7	41.1	UnDef	UnDef	6.0	UnDef	8.6	17.2
14.27	1.0E-07	-0.01	8.6	0.40	6	8.4	33.4	41.8	38.6	UnDef	UnDef	3.0	UnDef	4.1	8.2
15.26	5.0E-05	-0.01	9.8	0.68	6	9.6	38.3	47.8	40.0	30	30.0	3.0	0.06	3.7	7.5
16.24	1.0E-07	-0.01	7.5	0.74	6	7.6	30.6	38.2	46.8	UnDef	UnDef	3.0	UnDef	3.7	7.5
17.22	5.0E-04	0.00	32.5	0.93	7	30.0	25.5	55.5	22.2	36	32.8	1.0	-0.08	3.9	13.7
18.21	5.0E-03	0.00	103.8	0.78	9	95.2	10.6	105.8	8.8	42	65.9	1.0	-0.17	1.6	24.8
19.19	5.0E-03	0.00	83.8	1.19	9	78.4	22.7	101.0	13.4	42	60.3	1.0	-0.19	3.1	22.3
20.18	5.0E-03	0.00	65.7	0.91	9	62.7	19.1	81.8	13.7	40	53.9	1.0	-0.14	2.6	18.0
21.16	5.0E-03	0.00	47.0	0.50	9	46.0	13.4	59.4	13.5	38	45.0	1.0	-0.06	1.9	13.1
22.15	5.0E-03	0.00	84.3	0.75	9	82.7	13.4	96.1	10.2	42	61.8	1.0	-0.15	1.9	22.2
23.13	5.0E-03	0.00	80.0	1.22	9	79.7	25.4	105.1	14.1	42	60.8	1.0	-0.19	3.5	23.0
24.11	5.0E-03	-0.01	53.5	0.70	9	54.5	17.4	71.9	14.1	40	49.9	1.0	-0.10	2.4	15.7
25.10	5.0E-03	0.00	116.7	0.91	9	119.0	13.6	132.6	8.9	42	72.3	1.0	-0.19	2.0	31.1
26.08	5.0E-03	0.00	179.5	1.22	9	184.7	14.9	199.6	7.8	44	84.9	1.0	-0.26	2.2	47.4
27.07	5.0E-03	0.00	176.9	1.43	9	184.4	22.2	206.6	9.0	44	84.8	1.0	-0.28	3.2	48.4
28.05	5.0E-03	0.00	166.7	1.28	9	176.1	18.7	194.8	8.6	44	83.5	1.0	-0.26	2.8	45.8
29.04	5.0E-03	0.00	171.1	1.31	9	183.0	19.4	202.4	8.6	44	84.6	1.0	-0.27	2.9	47.6
30.02	5.0E-03	0.00	169.0	1.36	9	183.0	21.3	204.3	8.9	44	84.6	1.0	-0.27	3.1	47.9
31.00	5.0E-02	0.00	106.2	0.77	9	117.0	12.1	129.1	8.5	42	71.8	1.0	-0.17	1.4	24.3
31.99	5.0E-04	-0.02	26.0	0.28	7	30.2	0.0	30.2	5.0	36	32.9	1.0	0.04	0.0	9.9
32.97	5.0E-05	-0.05	9.4	1.21	6	12.1	48.5	60.6	46.9	30	30.0	3.0	0.02	4.7	9.5
33.96	5.0E-05	-0.04	14.0	1.01	6	17.4	69.5	86.8	36.7	32	30.0	6.0	-0.01	6.8	13.6
34.94	5.0E-05	-0.05	10.2	1.09	6	13.3	53.1	66.3	44.0	30	30.0	3.0	0.02	5.2	10.4
35.92	5.0E-05	-0.02	18.0	1.95	6	22.4	89.5	111.9	39.4	32	30.0	6.0	-0.08	8.8	17.5
36.91	5.0E-05	-0.01	33.0	2.23	7	39.9	88.8	128.7	30.8	36	40.9	6.0	-0.16	11.9	27.5
37.89	5.0E-03	-0.01	64.9	1.39	7	77.4	37.7	115.1	17.3	40	59.9	1.0	-0.18	4.9	23.8
38.88	5.0E-02	0.00	136.9	0.74	9	163.1	6.9	170.0	6.5	44	81.3	1.0	-0.19	0.8	32.7
39.86	5.0E-02	0.00	140.3	0.81	9	168.8	8.8	177.6	6.9	44	82.3	1.0	-0.20	1.1	34.1
40.85	5.0E-02	0.00	148.3	0.58	9	180.2	0.0	180.2	4.8	44	84.2	1.0	-0.18	0.0	35.3

Gregg In Situ, Inc.
Run No: 00-0119-1624-1193
CPT File: 073C06.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
41.83	173.3	0.48	0.28	-10.6	9	124.1	2.47	1.54	0.93	0.81	33.2	26.8	UnDef	0.32
42.81	49.6	0.78	1.58	20.0	7	117.8	2.53	1.57	0.96	0.80	15.8	12.7	UnDef	0.19
43.80	108.8	0.63	0.58	14.0	9	124.1	2.59	1.60	0.99	0.79	20.8	16.5	UnDef	0.17
44.78	154.5	0.88	0.57	3.0	9	124.1	2.65	1.63	1.02	0.78	29.6	23.2	UnDef	0.28
45.77	147.9	1.18	0.80	-2.1	9	124.1	2.71	1.66	1.05	0.78	28.3	22.0	UnDef	0.29
46.75	49.8	1.79	3.58	-8.7	5	114.6	2.77	1.68	1.09	0.77	23.9	18.4	3.77	0.00
47.74	33.2	1.19	3.58	-7.7	5	114.6	2.83	1.71	1.12	0.76	15.9	12.1	2.43	0.26
48.72	123.9	2.71	2.19	-6.0	7	117.8	2.88	1.74	1.15	0.76	39.6	30.0	UnDef	0.00
49.70	211.7	2.59	1.22	-9.0	8	120.9	2.94	1.77	1.18	0.75	50.7	38.2	UnDef	0.00
50.69	226.7	2.97	1.31	-10.7	8	120.9	3.00	1.79	1.21	0.75	54.3	40.5	UnDef	0.00
51.67	269.6	6.70	2.49	3.3	7	117.8	3.06	1.82	1.24	0.74	86.1	63.8	UnDef	0.00
52.66	164.7	1.22	0.74	11.6	9	124.1	3.12	1.85	1.27	0.74	31.5	23.2	UnDef	0.32
53.64	129.1	1.16	0.90	0.0	9	124.1	3.18	1.88	1.30	0.73	24.7	18.0	UnDef	0.24
54.63	133.3	1.04	0.78	-4.7	9	124.1	3.24	1.91	1.33	0.72	25.5	18.5	UnDef	0.23
55.61	173.7	1.40	0.81	-6.6	9	124.1	3.30	1.94	1.36	0.72	33.3	23.9	UnDef	0.35
56.59	214.9	1.75	0.82	-8.0	9	124.1	3.36	1.97	1.39	0.71	41.2	29.3	UnDef	0.00
57.58	197.2	2.01	1.02	-7.5	9	124.1	3.43	2.00	1.42	0.71	37.8	26.7	UnDef	0.00
58.56	211.0	1.95	0.93	-7.1	9	124.1	3.49	2.03	1.45	0.70	40.4	28.3	UnDef	0.00
59.55	220.2	1.70	0.77	-5.9	9	124.1	3.55	2.06	1.48	0.70	42.2	29.4	UnDef	0.00
60.53	220.6	1.80	0.82	-4.9	9	124.1	3.61	2.09	1.52	0.69	42.2	29.2	UnDef	0.00
61.52	209.0	2.15	1.03	-4.3	9	124.1	3.67	2.12	1.55	0.69	40.0	27.5	UnDef	0.00
62.42	226.0	1.85	0.82	-2.9	9	124.1	3.73	2.15	1.57	0.68	43.3	29.5	UnDef	0.00
63.32	233.8	1.66	0.71	-1.6	9	124.1	3.78	2.18	1.60	0.68	44.8	30.3	UnDef	0.00
64.30	164.1	1.73	1.06	-0.2	9	124.1	3.84	2.21	1.63	0.67	31.4	21.1	UnDef	0.35
65.29	180.8	1.56	0.86	0.8	9	124.1	3.90	2.24	1.66	0.67	34.6	23.1	UnDef	0.36
66.27	119.4	2.41	2.02	-1.4	7	117.8	3.96	2.27	1.69	0.66	38.1	25.3	UnDef	0.45
67.26	80.9	2.77	3.42	-2.4	6	114.6	4.02	2.30	1.73	0.66	31.0	20.5	6.15	0.00
68.24	150.0	2.23	1.49	0.5	8	120.9	4.08	2.32	1.76	0.66	35.9	23.6	UnDef	0.40
69.22	98.8	2.50	2.53	1.4	7	117.8	4.14	2.35	1.79	0.65	31.6	20.6	UnDef	0.00
70.21	89.9	2.91	3.24	2.2	6	114.6	4.19	2.38	1.82	0.65	34.4	22.3	6.86	0.00
71.19	231.9	4.07	1.76	3.6	8	120.9	4.25	2.40	1.85	0.64	55.5	35.8	UnDef	0.00
72.18	223.1	4.76	2.13	4.4	7	117.8	4.31	2.43	1.88	0.64	71.2	45.7	UnDef	0.00
73.16	199.5	4.21	2.11	4.3	7	117.8	4.37	2.46	1.91	0.64	63.7	40.6	UnDef	0.00
74.15	203.2	3.64	1.79	4.8	8	120.9	4.43	2.49	1.94	0.63	48.7	30.8	UnDef	0.00

Gregg In Situ, Inc.
Run No: 00-0119-1624-1193
CPT File: 073C06.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
41.83	5.0E-02	-0.01	111.0	0.28	9	136.7	0.0	136.7	3.9	42	76.2	1.0	-0.09	0.0	26.8
42.81	5.0E-04	-0.01	30.1	1.66	7	38.8	68.0	106.8	28.8	36	40.1	1.0	-0.12	8.4	21.0
43.80	5.0E-02	-0.01	66.5	0.60	9	84.3	16.1	100.4	11.0	40	62.4	1.0	-0.11	1.8	18.3
44.78	5.0E-02	-0.01	93.3	0.58	9	118.5	10.3	128.8	8.0	42	72.1	1.0	-0.13	1.2	24.4
45.77	5.0E-02	-0.01	87.6	0.81	9	112.4	18.9	131.4	10.4	42	70.6	1.0	-0.16	2.2	24.2
46.75	5.0E-06	-0.03	27.9	3.79	6	37.6	150.3	187.9	40.9	UnDef	UnDef	6.0	UnDef	18.4	36.8
47.74	5.0E-06	-0.04	17.7	3.91	4	24.8	99.2	124.0	50.0	UnDef	UnDef	6.0	UnDef	12.1	24.3
48.72	5.0E-04	-0.01	69.7	2.24	7	92.0	69.3	161.3	21.1	40	64.9	1.0	-0.24	11.0	41.1
49.70	5.0E-03	-0.01	118.3	1.24	9	156.0	28.7	184.6	10.8	42	80.0	1.0	-0.23	4.1	42.3
50.69	5.0E-03	-0.01	124.7	1.33	9	165.6	31.1	196.7	10.9	44	81.7	1.0	-0.24	4.4	45.0
51.67	5.0E-04	0.00	146.3	2.52	7	195.5	73.4	268.9	15.2	44	86.5	1.0	-0.35	13.1	76.9
52.66	5.0E-02	-0.01	87.3	0.76	9	118.4	18.2	136.7	10.0	42	72.1	1.0	-0.15	2.1	25.3
53.64	5.0E-02	-0.01	66.9	0.92	9	92.1	27.9	120.0	13.7	40	64.9	1.0	-0.14	3.1	21.1
54.63	5.0E-02	-0.01	68.0	0.80	9	94.3	23.8	118.2	12.6	40	65.6	1.0	-0.13	2.7	21.1
55.61	5.0E-02	-0.01	87.7	0.82	9	122.0	20.7	142.7	10.4	42	73.0	1.0	-0.16	2.4	26.3
56.59	5.0E-02	-0.01	107.2	0.83	9	149.7	17.4	167.1	8.9	42	78.8	1.0	-0.18	2.0	31.3
57.58	5.0E-02	-0.01	96.7	1.04	9	136.3	26.9	163.2	11.2	42	76.2	1.0	-0.19	3.1	29.8
58.56	5.0E-02	-0.01	102.1	0.94	9	144.8	22.7	167.5	10.1	42	77.9	1.0	-0.18	2.6	31.0
59.55	5.0E-02	-0.01	105.0	0.78	9	150.0	16.6	166.6	8.7	42	78.9	1.0	-0.17	1.9	31.3
60.53	5.0E-02	-0.01	103.6	0.83	9	149.2	18.7	167.8	9.2	42	78.7	1.0	-0.17	2.2	31.4
61.52	5.0E-02	-0.01	96.7	1.05	9	140.4	28.0	168.4	11.2	42	77.0	1.0	-0.19	3.2	30.7
62.42	5.0E-02	-0.01	103.3	0.83	9	150.8	19.2	169.9	9.2	42	79.0	1.0	-0.17	2.2	31.7
63.32	5.0E-02	-0.01	105.5	0.72	9	155.0	14.5	169.5	8.2	42	79.8	1.0	-0.16	1.7	32.1
64.30	5.0E-02	-0.01	72.5	1.08	9	108.0	34.5	142.5	14.1	40	69.5	1.0	-0.16	3.8	24.9
65.29	5.0E-02	-0.01	78.9	0.88	9	118.2	26.4	144.6	11.8	42	72.1	1.0	-0.15	3.0	26.1
66.27	5.0E-04	-0.02	50.9	2.09	7	77.6	80.6	158.2	24.1	38	60.0	1.0	-0.20	11.8	37.1
67.26	5.0E-05	-0.02	33.5	3.60	6	52.3	209.0	261.3	37.0	36	48.7	6.0	-0.24	20.5	40.9
68.24	5.0E-03	-0.01	62.8	1.53	7	96.3	54.0	150.3	18.4	40	66.2	1.0	-0.18	6.8	30.4
69.22	5.0E-04	-0.02	40.3	2.64	6	63.1	126.9	189.9	30.0	38	54.1	1.0	-0.20	14.8	35.3
70.21	5.0E-05	-0.02	36.1	3.40	6	57.1	228.3	285.3	35.0	38	51.2	6.0	-0.23	22.3	44.7
71.19	5.0E-03	-0.01	94.7	1.79	7	146.3	58.8	205.1	15.7	42	78.2	1.0	-0.24	7.8	43.6
72.18	5.0E-04	-0.01	90.0	2.18	7	140.0	75.5	215.5	18.1	42	76.9	1.0	-0.27	12.8	58.5
73.16	5.0E-04	-0.01	79.3	2.16	7	124.5	77.0	201.4	19.3	42	73.5	1.0	-0.25	12.8	53.4
74.15	5.0E-03	-0.01	79.9	1.83	7	126.1	63.9	189.9	17.6	42	73.9	1.0	-0.23	8.2	39.1

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0207-1059-4837
Job No: 00-559SH
Client: BAGAHI ENGINEERING
Project: NEPTUNE MARINA
Site: NEPTUNE MARINA
Location: CPT-7
KEN BAGAHI
CPT Date: 00/01/02
CPT Time: 09:06
CPT File: 559C07.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 4.15 (ft): 13.6
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
0.49	75.1	0.35	0.46	0.5	8	120.9	0.03	0.03	0.00	2.00	18.0	36.0	UnDef	0.36
1.48	83.6	0.60	0.72	-0.1	8	120.9	0.09	0.09	0.00	2.00	20.0	40.0	UnDef	0.00
2.46	83.6	0.60	0.72	-0.1	8	120.9	0.15	0.15	0.00	2.00	20.0	40.0	UnDef	0.00
3.44	162.1	1.03	0.64	0.0	9	124.1	0.21	0.21	0.00	2.00	31.1	62.1	UnDef	0.00
4.43	122.3	1.13	0.93	0.0	8	120.9	0.27	0.27	0.00	1.93	29.3	56.4	UnDef	0.00
5.41	130.5	1.05	0.80	0.1	9	124.1	0.33	0.33	0.00	1.74	25.0	43.5	UnDef	0.00
6.40	84.4	0.92	1.09	0.3	8	120.9	0.39	0.39	0.00	1.60	20.2	32.4	UnDef	0.31
7.30	108.7	1.18	1.08	0.1	8	120.9	0.44	0.44	0.00	1.50	26.0	39.0	UnDef	0.00
8.20	145.2	1.06	0.73	0.3	9	124.1	0.50	0.50	0.00	1.41	27.8	39.3	UnDef	0.00
9.19	106.4	1.29	1.21	0.3	8	120.9	0.56	0.56	0.00	1.34	25.5	34.0	UnDef	0.39
10.17	111.3	0.94	0.85	0.5	8	120.9	0.62	0.62	0.00	1.27	26.6	33.8	UnDef	0.34
11.15	101.9	0.91	0.89	0.7	8	120.9	0.68	0.68	0.00	1.21	24.4	29.6	UnDef	0.27
12.14	45.3	0.51	1.12	2.0	7	117.8	0.74	0.74	0.00	1.16	14.5	16.8	UnDef	0.12
13.21	14.0	0.18	1.32	7.4	6	114.6	0.80	0.80	0.00	1.12	5.4	6.0	1.05	0.12
14.27	9.9	0.15	1.54	11.6	5	114.6	0.86	0.84	0.02	1.09	4.7	5.2	0.72	0.09
15.26	15.6	0.03	0.18	10.9	6	114.6	0.92	0.87	0.05	1.07	6.0	6.4	1.17	0.00
16.24	18.2	0.05	0.29	11.6	7	117.8	0.97	0.89	0.08	1.06	5.8	6.1	UnDef	0.00
17.22	17.5	0.04	0.23	15.0	7	117.8	1.03	0.92	0.11	1.04	5.6	5.8	UnDef	0.00
18.21	33.8	0.13	0.40	7.0	7	117.8	1.09	0.95	0.14	1.03	10.8	11.1	UnDef	0.08
19.19	44.6	0.11	0.24	4.1	8	120.9	1.15	0.97	0.17	1.01	10.7	10.8	UnDef	0.09
20.18	69.4	0.14	0.20	3.3	8	120.9	1.21	1.00	0.21	1.00	16.6	16.6	UnDef	0.11
21.16	79.5	0.29	0.37	3.7	8	120.9	1.27	1.03	0.24	0.98	19.0	18.7	UnDef	0.12

Gregg In Situ, Inc.
Run No: 00-0207-1059-4837
CPT File: 559C07.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
22.15	66.8	0.28	0.42	-0.5	8	120.9	1.33	1.06	0.27	0.97	16.0	15.5	UnDef	0.10
23.13	38.7	0.18	0.47	1.0	7	117.8	1.39	1.09	0.30	0.96	12.4	11.9	UnDef	0.08
24.11	53.1	0.23	0.43	-2.7	8	120.9	1.45	1.12	0.33	0.95	12.7	12.0	UnDef	0.09
25.10	64.9	0.16	0.24	-4.2	8	120.9	1.50	1.15	0.36	0.93	15.5	14.5	UnDef	0.10
26.08	61.2	0.24	0.39	-7.3	8	120.9	1.56	1.17	0.39	0.92	14.6	13.5	UnDef	0.10
27.07	117.2	0.54	0.46	-10.7	9	124.1	1.62	1.20	0.42	0.91	22.5	20.5	UnDef	0.19
28.05	212.5	1.45	0.68	-17.7	9	124.1	1.69	1.23	0.45	0.90	40.7	36.6	UnDef	0.00
29.04	209.8	1.78	0.85	-15.9	9	124.1	1.75	1.26	0.48	0.89	40.2	35.7	UnDef	0.00
30.02	193.3	1.50	0.77	-14.8	9	124.1	1.81	1.30	0.51	0.88	37.0	32.5	UnDef	0.00
31.00	233.3	0.99	0.42	-12.3	9	124.1	1.87	1.33	0.54	0.87	44.7	38.8	UnDef	0.00
31.99	209.4	1.22	0.58	-9.3	9	124.1	1.93	1.36	0.57	0.86	40.1	34.4	UnDef	0.00
32.97	35.3	0.80	2.27	-6.6	6	114.6	1.99	1.38	0.60	0.85	13.5	11.5	2.66	0.37
33.96	25.8	0.34	1.33	-0.1	6	114.6	2.05	1.41	0.64	0.84	9.9	8.3	1.90	0.19
34.94	17.3	0.10	0.60	7.0	6	114.6	2.10	1.44	0.67	0.83	6.6	5.5	1.22	0.11
35.92	24.2	0.13	0.53	14.8	7	117.8	2.16	1.46	0.70	0.83	7.7	6.4	UnDef	0.10
36.91	27.8	0.23	0.84	18.7	7	117.8	2.22	1.49	0.73	0.82	8.9	7.3	UnDef	0.13
37.89	56.6	0.57	1.01	6.0	7	117.8	2.27	1.52	0.76	0.81	18.1	14.7	UnDef	0.13
38.88	125.9	0.71	0.57	-15.2	9	124.1	2.33	1.54	0.79	0.80	24.1	19.4	UnDef	0.21
39.86	21.9	0.41	1.87	-18.0	6	114.6	2.39	1.57	0.82	0.80	8.4	6.7	1.56	0.14
40.85	92.9	0.96	1.03	-17.2	8	120.9	2.45	1.60	0.85	0.79	22.2	17.6	UnDef	0.18
41.83	227.9	1.47	0.64	-16.5	9	124.1	2.51	1.63	0.88	0.78	43.6	34.2	UnDef	0.00
42.81	269.3	1.55	0.58	-18.8	9	124.1	2.57	1.66	0.91	0.78	51.6	40.0	UnDef	0.00
43.80	265.1	2.12	0.80	-20.7	9	124.1	2.63	1.69	0.94	0.77	50.8	39.1	UnDef	0.00
44.78	291.6	2.37	0.81	-10.6	9	124.1	2.69	1.72	0.97	0.76	55.8	42.6	UnDef	0.00
45.77	297.2	2.89	0.97	-17.4	9	124.1	2.76	1.75	1.00	0.76	56.9	43.0	UnDef	0.00
46.75	360.5	3.26	0.91	-20.0	9	124.1	2.82	1.78	1.04	0.75	69.0	51.7	UnDef	0.00
47.74	358.1	2.83	0.79	-15.2	9	124.1	2.88	1.81	1.07	0.74	68.6	51.0	UnDef	0.00
48.72	329.7	4.72	1.43	-14.7	8	120.9	2.94	1.84	1.10	0.74	78.9	58.2	UnDef	0.00
49.70	330.7	4.06	1.23	-16.2	9	124.1	3.00	1.87	1.13	0.73	63.3	46.3	UnDef	0.00
50.69	294.4	2.62	0.89	-16.1	9	124.1	3.06	1.90	1.16	0.73	56.4	40.9	UnDef	0.00
51.67	418.5	2.36	0.56	-9.5	10	127.3	3.12	1.93	1.19	0.72	66.8	48.1	UnDef	0.00
52.66	509.5	3.22	0.63	-8.2	10	127.3	3.18	1.96	1.22	0.71	81.3	58.0	UnDef	0.00
53.64	603.8	4.58	0.76	-6.0	10	127.3	3.25	2.00	1.25	0.71	96.4	68.2	UnDef	0.00
54.63	511.0	3.59	0.70	2.9	10	127.3	3.31	2.03	1.28	0.70	81.6	57.3	UnDef	0.00
55.61	630.4	6.61	1.05	7.5	9	124.1	3.37	2.06	1.31	0.70	120.7	84.1	UnDef	0.00
56.59	514.7	7.44	1.45	7.2	9	124.1	3.43	2.09	1.34	0.69	98.6	68.2	UnDef	0.00
57.58	404.3	3.38	0.84	6.8	9	124.1	3.49	2.12	1.37	0.69	77.4	53.2	UnDef	0.00
58.56	303.1	3.46	1.14	6.0	9	124.1	3.55	2.15	1.40	0.68	58.1	39.6	UnDef	0.00

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0207-1059-4837
Job No: 00-559SH
Client: BAGAHI ENGINEERING
Project: NEPTUNE MARINA
Site: NEPTUNE MARINA
Location: CPT-7
KEN BAGAHI
CPT Date: 00/01/02
CPT Time: 09:06
CPT File: 559C07.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 4.15 (ft): 13.6
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.49	5.0E-03	0.00	1000.0	0.46	10	143.8	0.0	143.8	0.0	50	95.0	1.0	-0.32	0.0	36.0
1.48	5.0E-03	0.00	935.6	0.72	10	160.2	0.0	160.2	0.0	50	95.0	1.0	-0.36	0.0	40.0
2.46	5.0E-03	0.00	560.9	0.72	10	160.1	0.0	160.1	0.4	50	88.8	1.0	-0.32	0.0	40.0
3.44	5.0E-02	0.00	774.4	0.64	10	310.5	0.0	310.5	0.0	50	95.0	1.0	-0.33	0.0	62.1
4.43	5.0E-03	0.00	453.1	0.93	9	230.6	0.0	230.6	2.0	48	91.2	1.0	-0.32	0.0	56.4
5.41	5.0E-02	0.00	394.9	0.80	9	222.4	0.0	222.4	1.8	48	90.2	1.0	-0.29	0.0	43.5
6.40	5.0E-03	0.00	215.4	1.09	9	132.2	3.8	136.0	6.0	46	75.3	1.0	-0.27	0.6	32.9
7.30	5.0E-03	0.00	243.5	1.09	9	159.5	1.6	161.1	5.4	46	80.7	1.0	-0.28	0.2	39.3
8.20	5.0E-02	0.00	289.5	0.74	9	201.0	0.0	201.0	2.6	46	87.3	1.0	-0.26	0.0	39.3
9.19	5.0E-03	0.00	189.0	1.22	9	139.1	9.8	149.0	7.5	44	76.7	1.0	-0.27	1.5	35.5
10.17	5.0E-03	0.00	178.6	0.85	9	138.3	2.5	140.8	5.7	44	76.6	1.0	-0.23	0.4	34.2
11.15	5.0E-03	0.00	149.0	0.89	9	121.0	7.0	127.9	7.0	44	72.7	1.0	-0.21	1.0	30.6
12.14	5.0E-04	0.00	60.4	1.14	7	51.6	22.3	73.9	16.3	40	48.3	1.0	-0.15	3.9	20.8
13.21	5.0E-05	0.02	16.5	1.40	6	15.3	61.2	76.5	37.1	32	30.0	6.0	-0.04	6.0	12.0
14.27	5.0E-06	0.04	10.7	1.69	6	10.5	42.2	52.7	48.1	UnDef	UnDef	3.0	UnDef	5.2	10.3
15.26	5.0E-05	0.02	17.0	0.19	7	16.4	0.0	16.4	5.0	32	30.0	6.0	0.10	0.0	6.4
16.24	5.0E-04	0.02	19.3	0.31	7	18.8	0.0	18.8	5.0	32	30.0	1.0	0.06	0.0	6.1
17.22	5.0E-04	0.02	17.9	0.24	7	17.9	0.0	17.9	5.0	32	30.0	1.0	0.08	0.0	5.8
18.21	5.0E-04	0.00	34.6	0.41	7	34.0	0.0	34.0	5.0	36	36.4	1.0	-0.02	0.0	11.1
19.19	5.0E-03	0.00	44.6	0.25	9	44.2	0.0	44.2	5.0	38	43.9	1.0	0.00	0.0	10.8
20.18	5.0E-03	0.00	68.0	0.20	9	67.8	0.0	67.8	5.0	40	56.1	1.0	-0.02	0.0	16.6
21.16	5.0E-03	0.00	75.8	0.37	9	76.5	0.0	76.5	5.0	40	59.6	1.0	-0.08	0.0	18.7

Gregg In Situ, Inc.
Run No: 00-0207-1059-4837
CPT File: 559C07.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
22.15	5.0E-03	0.00	61.7	0.43	9	63.4	0.0	63.4	5.0	40	54.2	1.0	-0.07	0.0	15.5
23.13	5.0E-04	-0.01	34.3	0.49	7	36.3	0.0	36.3	5.0	36	38.3	1.0	-0.03	0.0	11.9
24.11	5.0E-03	-0.01	46.2	0.45	9	49.1	0.0	49.1	5.0	38	46.9	1.0	-0.05	0.0	12.0
25.10	5.0E-03	-0.01	55.3	0.25	9	59.3	0.0	59.3	5.0	40	52.3	1.0	-0.02	0.0	14.5
26.08	5.0E-03	-0.01	50.7	0.40	9	55.2	0.0	55.2	5.0	38	50.3	1.0	-0.05	0.0	13.5
27.07	5.0E-02	-0.01	96.0	0.47	9	104.5	0.0	104.5	5.0	42	68.5	1.0	-0.12	0.0	20.5
28.05	5.0E-02	0.00	170.8	0.69	9	187.2	0.0	187.2	4.8	44	85.2	1.0	-0.20	0.0	36.6
29.04	5.0E-02	0.00	164.5	0.86	9	182.6	5.9	188.5	6.2	44	84.5	1.0	-0.22	0.7	36.5
30.02	5.0E-02	-0.01	147.9	0.78	9	166.2	6.1	172.4	6.3	44	81.8	1.0	-0.20	0.7	33.3
31.00	5.0E-02	0.00	174.6	0.43	9	198.3	0.0	198.3	2.8	44	86.9	1.0	-0.16	0.0	38.8
31.99	5.0E-02	0.00	153.0	0.59	9	176.0	0.0	176.0	4.7	44	83.5	1.0	-0.18	0.0	34.4
32.97	5.0E-05	-0.02	24.1	2.41	6	29.3	117.4	146.7	37.0	34	32.1	6.0	-0.13	11.5	23.0
33.96	5.0E-05	-0.03	16.9	1.44	6	21.3	85.1	106.4	37.0	32	30.0	6.0	-0.05	8.3	16.7
34.94	5.0E-05	-0.03	10.6	0.68	6	14.1	56.6	70.7	38.5	30	30.0	3.0	0.05	5.5	11.1
35.92	5.0E-04	-0.01	15.0	0.58	7	19.5	41.7	61.3	30.5	32	30.0	1.0	0.03	4.7	11.1
36.91	5.0E-04	-0.01	17.2	0.91	7	22.3	56.7	79.0	31.9	32	30.0	1.0	-0.01	5.9	13.2
37.89	5.0E-04	-0.01	35.9	1.06	7	45.0	37.2	82.2	21.9	38	44.4	1.0	-0.10	5.8	20.5
38.88	5.0E-02	-0.01	80.0	0.58	9	99.1	12.5	111.6	9.2	42	67.0	1.0	-0.12	1.5	20.9
39.86	5.0E-05	-0.07	12.4	2.10	6	17.1	68.3	85.4	48.0	30	30.0	3.0	-0.05	6.7	13.4
40.85	5.0E-03	-0.02	56.5	1.06	7	71.9	31.6	103.5	16.4	40	57.8	1.0	-0.14	4.2	21.7
41.83	5.0E-02	-0.01	138.3	0.65	9	174.7	3.9	178.5	5.8	44	83.3	1.0	-0.18	0.5	34.7
42.81	5.0E-02	-0.01	160.7	0.58	9	204.6	0.0	204.6	4.4	44	87.8	1.0	-0.18	0.0	40.0
43.80	5.0E-02	-0.01	155.3	0.81	9	199.5	6.6	206.1	6.2	44	87.1	1.0	-0.21	0.8	39.9
44.78	5.0E-02	0.00	167.9	0.82	9	217.5	4.9	222.4	5.8	44	89.6	1.0	-0.22	0.6	43.2
45.77	5.0E-02	-0.01	168.2	0.98	9	219.8	11.2	231.0	6.8	44	89.8	1.0	-0.24	1.3	44.4
46.75	5.0E-02	0.00	200.8	0.91	9	264.3	2.8	267.1	5.4	46	95.0	1.0	-0.24	0.3	52.1
47.74	5.0E-02	0.00	196.1	0.80	9	260.4	0.0	260.4	4.8	46	94.7	1.0	-0.23	0.0	51.0
48.72	5.0E-03	0.00	177.5	1.44	9	237.8	28.8	266.6	9.1	44	92.1	1.0	-0.28	4.2	62.4
49.70	5.0E-02	0.00	175.1	1.24	9	236.6	21.0	257.6	8.1	44	92.0	1.0	-0.26	2.5	48.8
50.69	5.0E-02	-0.01	153.3	0.90	9	209.0	11.1	220.1	6.9	44	88.4	1.0	-0.22	1.3	42.2
51.67	5.0E+00	0.00	215.0	0.57	9	294.7	0.0	294.7	2.8	46	95.0	1.0	-0.21	0.0	48.1
52.66	5.0E+00	0.00	257.8	0.64	9	355.8	0.0	355.8	2.5	46	95.0	1.0	-0.23	0.0	58.0
53.64	5.0E+00	0.00	300.8	0.76	9	418.2	0.0	418.2	2.6	46	95.0	1.0	-0.26	0.0	68.2
54.63	5.0E+00	0.00	250.3	0.71	9	351.2	0.0	351.2	3.0	46	95.0	1.0	-0.24	0.0	57.3
55.61	5.0E-02	0.00	304.5	1.05	9	429.9	0.0	429.9	4.1	46	95.0	1.0	-0.30	0.0	84.1
56.59	5.0E-02	0.00	244.7	1.46	9	348.5	21.8	370.2	7.2	46	95.0	1.0	-0.32	2.6	70.8
57.58	5.0E-02	0.00	189.1	0.84	9	271.7	2.2	273.9	5.3	44	95.0	1.0	-0.23	0.3	53.5
58.56	5.0E-02	0.00	139.3	1.16	9	202.3	24.9	227.2	9.1	44	87.5	1.0	-0.23	2.9	42.5

DATE OBSERVED: 1/31/2000

LOG OF BORING NO. B-8

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 15.2'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb. SPT
400 lb sampler RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type		Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
		B			9.2		4"± AC
2-							
4-			S	7	29.6		@ 5'Light brown fine silty SAND, loose, trace of shell fragments, very moist
6-							
8-							
10-			R	14	13.1	93.9	
12-							
14-			S	4	39.5		@15' Dark gray fine sandy SILT , soft, wet
16-							
18-							
20-			R	5	22.5	102.4	@20' Dark gray fine silty SAND, trace silt, loose, many shell fragments, wet
22-							
24-			S	4	57.6		@25' Becoming silty with organic odor
26-							
28-							
30-			R	5	46.5	76.8	@30' Becoming fine to medium SAND @31' Dark gray sandy SILT, soft, wet
32-							
34-			S	21			
36-							
38-							
40-			R	10	22.2	102.0	@40' Dark greenish gray sandy SILT, medium dense, wet
42-							@44' Light greenish gray medium SAND, trace of fine gravel, wet
44-							

JOB NO.: 99m-200-00

FIGURE: B-17

SHEET 1 OF 2

BAGAHI ENGINEERING

DATE OBSERVED: 1/31/2000

LOG OF BORING NO. B-8

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 15.2'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb SPT
400 lb RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-						@44' Light greenish gray medium SAND, trace fine gravel, wet
		S	67	14.2		
46-						@45' Light gray SAND, very dense, wet
48-						
50-		R	45	18.1	114.1	
52-						
54-						
		S	64	7.1		
56-						@55' Light greenish gray gravelly SAND, dense to very dense, wet
58-						
60-		R	45	10.1		
62-						@60' Greenish gray fine silty SAND, some coarse Gravel, dense, wet
64-						End of boring @60'
66-						Ground water @15' after drilling Cave in @24'
68-						Monitoring Well: Installed 10' slotted and 10' solid 2-inch PVC pipe for a total depth of 20 feet.
70-						
72-						
74-						
76-						
78-						
80-						
82-						
84-						
86-						
88-						

JOB NO.: 99m-200-00

FIGURE: B-18

BAGAHI ENGINEERING

DATE OBSERVED: 1/31/2000 **LOG OF BORING NO. B-9** LOCATION: See Plot Plan

LOGGED BY: SG METHOD OF DRILLING: 5" Rotary Wash Auger GROUND EL.: Elev. 12.6'±

DRILLING CONTRACTOR: A & W HAMMER: 140 lb. SPT FALLING: 30 inches
400 lb sampler RING 18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
						4"± AC
2-						
4-						@ 5'Light brown fine SAND, medium dense, trace of shell fragments, moist
6-		S	22	22.3		
8-						
10-		R	17	20.0	91.1	
12-						
14-		S	1	68.1		@15' Dark gray organic sandy SILT/silty SAND, loose, wet
16-						
18-						
20-		R	4	23.7	100.4	@20' Same as above, increase in shell fragments
22-						
24-		S	14	29.2		
26-						@25' Dark gray silty SAND, medium dense, end of shell fragments, trace gravel, wet
28-						
30-		R	40	27.5	99.7	
32-						
34-		S	6	28.9		
36-						@35' Greenish gray sandy SILT, soft, wet
38-						
40-		R	40	11.7	120.7	@39' Greenish gray gravelly coarse SAND, dense, wet
42-						
44-						

JOB NO.: 99m-200-00 FIGURE: B-19

BAGAHI ENGINEERING

DATE OBSERVED: 1/31/2000

LOG OF BORING NO. B-9

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 12.6'±.

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb SPT, 400 lb RING

FALLING: 30 inches, 18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-						Greenish gray gravelly coarse SAND, dense, wet
		S	58	13.6		
46-						
48-						
50-		R	37	9.3	125.7	
52-						
54-						
		S	29	28.0		@55' Greenish gray sandy SILT/fine silty SAND, medium dense to dense, wet
56-						
58-						
60-		R	40	29.8	93.1	
62-						
64-						End of boring @60' Ground water @13' after drilling No cave in
66-						
68-						Installed 20 feet of monitoring well, 10' perforated and 10' solid 2-inch PVC pipe
70-						
72-						
74-						
76-						
78-						
80-						
82-						
84-						
86-						
88-						

JOB NO.: 99m-200-00

FIGURE: B-20

BAGAHI ENGINEERING

DATE OBSERVED: 1/31/2000

LOG OF BORING NO. B-10

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 12.3'

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb. SPT
400 lb sampler RING

FALLING: 30 inches
18 inches

This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	
		B		9.2		4"± AC
2-						
4-						@ 5'Light brown fine SAND, medium dense, moist
6-		S	19			
8-						
10-		R	11	29.0	94.8	
12-						
14-		S	6	40.4		@15' greenish gray sandy SILT/silty SAND, loose, many shell fragments, wet
16-						
18-						
20-		R	5	28.7	95.7	@20' becoming silty SAND, loose
22-						
24-		S	25	22.3		@25' Greenish gray, silty fine SAND, becoming more dense, wet
26-						
28-						
30-		R	8	18.5	114.2	@30' Changing to coarse SAND, trace of fine gravel, loose to medium dense, wet
32-						@32' gravelly SAND, wet
34-		S	33	9.0		
36-						
38-						
40-		R	8	18.5	110.2	@39' Dark gray silty SAND/sandy SILT, loose to medium dense, wet
42-						
44-						

JOB NO.: 99m-200-00

FIGURE: B-21

BAGAHI ENGINEERING

DATE OBSERVED: 1/31/2000

LOG OF BORING NO. B-10

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: Elev. 12.3'

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb SPT
400 lb RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-						
		S	39	15.3		@45' Greenish gray medium to fine silty SAND, dense, wet
46-						
48-						
50-		R	37	29.0	96.0	@50' Greenish gray fine silty SAND, dense, wet
52-						
54-						End of boring @50' Ground water @9' at end of drilling Cave in @15'
56-						
58-						Installed 12' of monitoring well; 10' perforated and 2' solid PVC pipe
60-						
62-						
64-						
66-						
68-						
70-						
72-						
74-						
76-						
78-						
80-						
82-						
84-						
86-						
88-						

JOB NO.: 99m-200-00

FIGURE: B-22

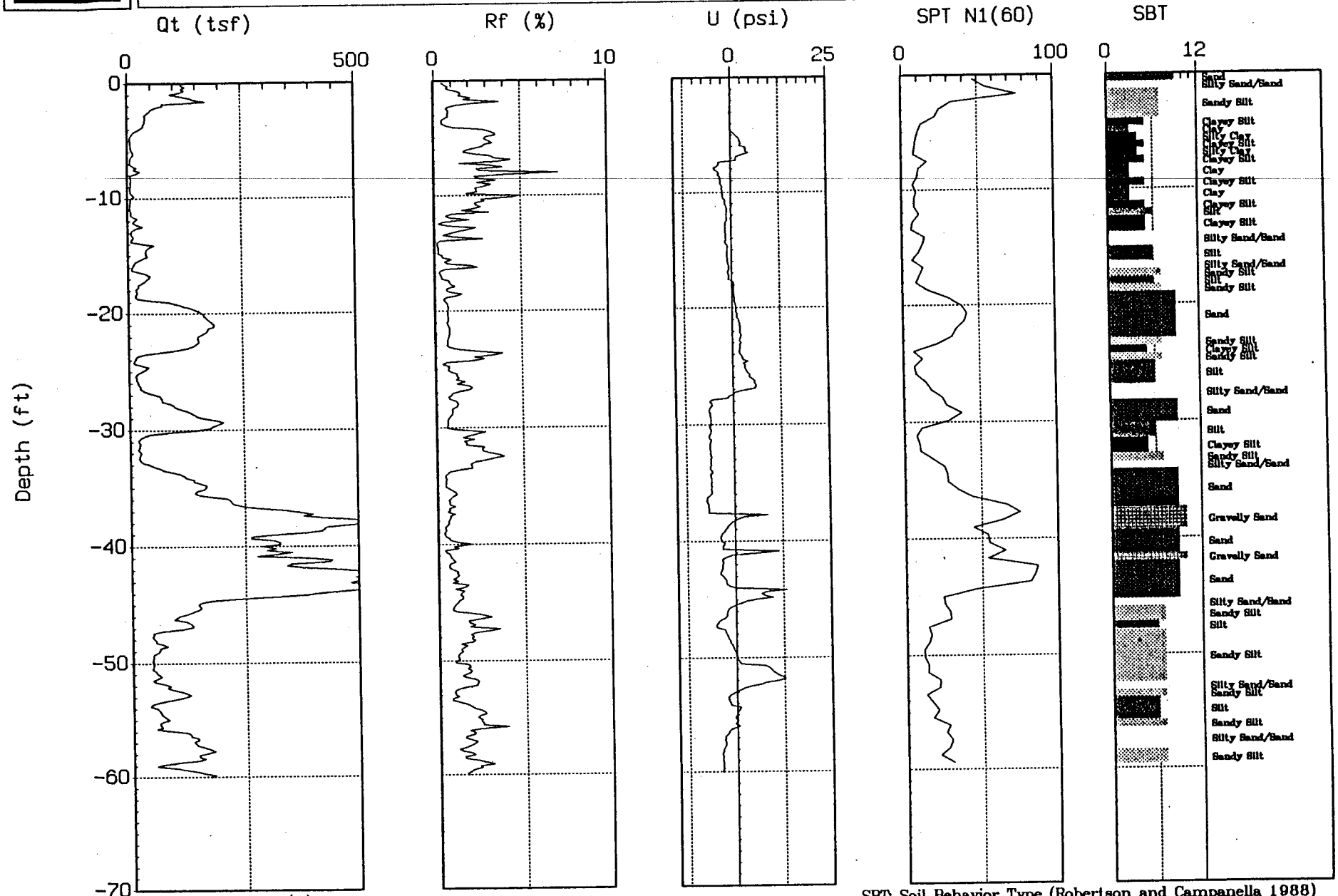
BAGAHI ENGINEERING

GREGG

BAGAHI ENGINEERING

Site : NEPTUNE MARINA
Location : CPT-8

ENGINEER : KEN BAGAHI
Date : 02:01:00 09:51



Max. Depth: 60.04 (ft)

Depth Inc.: 0.164 (ft)

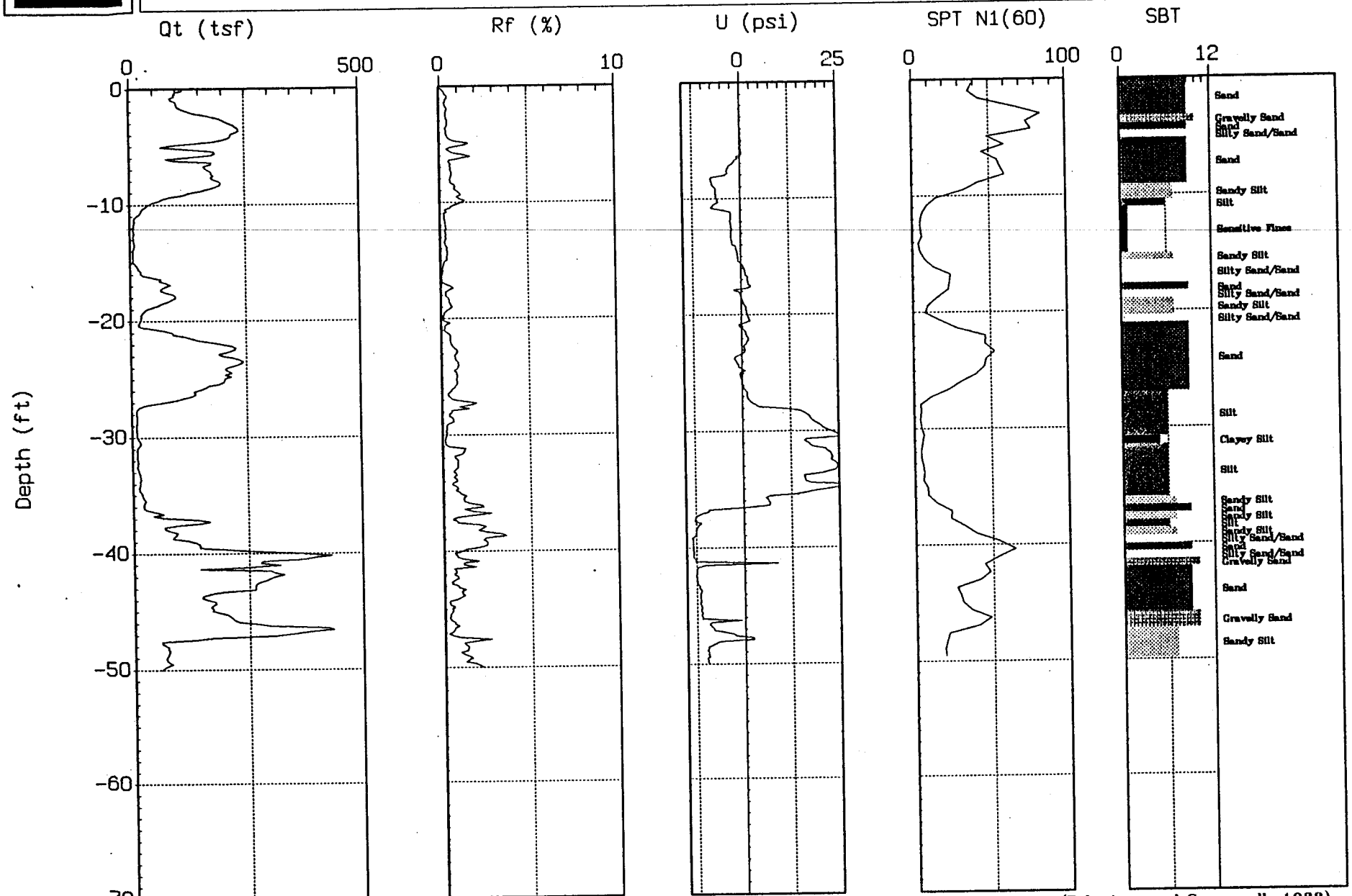
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

BAGAHI ENGINEERING

Site : NEPTUNE MARINA
Location : CPT-9

ENGINEER : KEN BAGAHI
Date : 02:01:00 14:08



Max. Depth: 50.03 (ft)

Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0207-1059-4864
Job No: 00-559SH
Client: BAGAHI ENGINEERING
Project: NEPTUNE MARINA
Site: NEPTUNE MARINA
Location: CPT-8
KEN BAGAHI
CPT Date: 00/01/02
CPT Time: 09:51
CPT File: 559C08.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 2.01 (ft): 6.6
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60	(N1)60 (blows/ft)	Su (tsf)	CRR
0.49	117.0	0.96	0.82	-0.1	8	120.9	0.03	0.03	0.00	2.00	28.0	56.0	UnDef	0.00
1.48	121.7	2.41	1.98	-0.1	7	117.8	0.09	0.09	0.00	2.00	38.9	77.7	UnDef	0.00
2.46	47.1	0.42	0.88	-0.2	7	117.8	0.15	0.15	0.00	2.00	15.0	30.1	UnDef	0.15
3.44	35.9	0.21	0.58	-0.2	7	117.8	0.20	0.20	0.00	2.00	11.4	22.9	UnDef	0.11
4.43	10.8	0.27	2.46	0.5	5	114.6	0.26	0.26	0.00	1.96	5.2	10.1	0.84	0.10
5.41	7.1	0.20	2.83	5.2	4	114.6	0.32	0.32	0.00	1.77	4.5	8.0	0.54	0.10
6.40	8.2	0.20	2.49	8.0	4	114.6	0.37	0.37	0.00	1.63	5.2	8.5	0.62	0.11
7.30	15.3	0.44	2.84	-3.3	5	114.6	0.43	0.40	0.02	1.57	7.3	11.5	1.19	0.15
8.20	8.8	0.29	3.36	-8.3	3	111.4	0.48	0.43	0.05	1.53	8.4	12.8	0.66	0.11
9.19	6.9	0.18	2.62	-6.0	4	114.6	0.53	0.45	0.08	1.49	4.4	6.5	0.51	0.09
10.17	7.4	0.22	2.95	-4.9	4	114.6	0.59	0.48	0.11	1.45	4.7	6.8	0.54	0.09
11.15	6.6	0.13	1.96	-3.2	4	114.6	0.65	0.50	0.14	1.41	4.2	6.0	0.48	0.09
12.14	19.2	0.13	0.66	-3.0	6	114.6	0.70	0.53	0.17	1.38	7.3	10.1	1.48	0.09
13.21	8.0	0.11	1.44	-3.7	5	114.6	0.76	0.56	0.21	1.34	3.8	5.1	0.58	0.09
14.27	41.5	0.07	0.17	-3.2	8	120.9	0.83	0.59	0.24	1.31	9.9	13.0	UnDef	0.09
15.26	27.1	0.10	0.37	-2.8	7	117.8	0.88	0.61	0.27	1.28	8.7	11.1	UnDef	0.08
16.24	22.6	0.13	0.56	-2.0	7	117.8	0.94	0.64	0.30	1.25	7.2	9.0	UnDef	0.09
17.22	31.8	0.17	0.53	-1.6	7	117.8	1.00	0.67	0.33	1.22	10.2	12.4	UnDef	0.09
18.21	17.1	0.17	1.00	1.0	6	114.6	1.06	0.69	0.36	1.20	6.6	7.9	1.28	0.09
19.19	107.0	0.70	0.65	1.4	8	120.9	1.12	0.72	0.39	1.18	25.6	30.2	UnDef	0.26
20.18	168.0	1.19	0.71	2.4	9	124.1	1.18	0.75	0.42	1.15	32.2	37.1	UnDef	0.00
21.16	180.0	1.31	0.73	4.0	9	124.1	1.24	0.78	0.45	1.13	34.5	39.0	UnDef	0.00

Gregg In Situ, Inc.
Run No: 00-0207-1059-4864
CPT File: 559C08.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
22.15	153.7	1.13	0.73	4.7	9	124.1	1.30	0.81	0.49	1.11	29.4	32.7	UnDef	0.00
23.13	86.1	0.90	1.04	4.5	8	120.9	1.36	0.84	0.52	1.09	20.6	22.5	UnDef	0.20
24.11	19.6	0.27	1.37	5.8	6	114.6	1.42	0.87	0.55	1.07	7.5	8.1	1.46	0.14
25.10	22.0	0.19	0.84	7.6	6	114.6	1.47	0.89	0.58	1.06	8.4	8.9	1.65	0.10
26.08	21.4	0.34	1.58	11.8	6	114.6	1.53	0.92	0.61	1.04	8.2	8.5	1.59	0.18
27.07	60.5	0.59	0.98	5.2	7	117.8	1.59	0.95	0.64	1.03	19.3	19.9	UnDef	0.13
28.05	108.9	1.16	1.06	-11.8	8	120.9	1.64	0.97	0.67	1.01	26.1	26.4	UnDef	0.27
29.04	174.9	1.28	0.73	-14.3	9	124.1	1.70	1.00	0.70	1.00	33.5	33.4	UnDef	0.00
30.02	109.5	0.99	0.90	-14.1	8	120.9	1.77	1.03	0.73	0.98	26.2	25.8	UnDef	0.24
31.00	19.7	0.34	1.74	-14.5	6	114.6	1.82	1.06	0.76	0.97	7.5	7.3	1.43	0.16
31.99	19.5	0.59	3.02	-14.4	5	114.6	1.88	1.09	0.79	0.96	9.3	9.0	1.41	0.15
32.97	46.5	1.01	2.17	-14.1	6	114.6	1.94	1.11	0.82	0.95	17.8	16.9	3.56	0.22
33.96	119.4	0.72	0.60	-14.2	9	124.1	1.99	1.14	0.85	0.94	22.9	21.4	UnDef	0.23
34.94	155.4	0.85	0.55	-14.0	9	124.1	2.06	1.17	0.88	0.92	29.8	27.5	UnDef	0.35
35.92	200.6	1.60	0.80	-15.0	9	124.1	2.12	1.20	0.92	0.91	38.4	35.1	UnDef	0.00
36.91	337.8	2.46	0.73	-16.1	9	124.1	2.18	1.23	0.95	0.90	64.7	58.3	UnDef	0.00
37.89	490.5	3.01	0.61	1.7	10	127.3	2.24	1.26	0.98	0.89	78.3	69.7	UnDef	0.00
38.88	345.7	1.34	0.39	-5.5	10	127.3	2.30	1.29	1.01	0.88	55.2	48.5	UnDef	0.00
39.86	311.9	3.25	1.04	-7.9	9	124.1	2.36	1.33	1.04	0.87	59.7	51.9	UnDef	0.00
40.85	369.5	2.30	0.62	3.0	10	127.3	2.43	1.36	1.07	0.86	59.0	50.6	UnDef	0.00
41.83	430.5	3.39	0.79	-7.9	9	124.1	2.49	1.39	1.10	0.85	82.5	70.0	UnDef	0.00
42.81	512.9	4.99	0.97	-7.9	9	124.1	2.55	1.42	1.13	0.84	98.2	82.5	UnDef	0.00
43.80	450.3	6.11	1.36	5.6	9	124.1	2.61	1.45	1.16	0.83	86.2	71.7	UnDef	0.00
44.78	167.9	1.94	1.16	13.0	8	120.9	2.67	1.48	1.19	0.82	40.2	33.1	UnDef	0.00
45.77	114.8	1.76	1.54	-3.9	8	120.9	2.73	1.51	1.22	0.81	27.5	22.4	UnDef	0.30
46.75	113.3	2.32	2.05	-9.3	7	117.8	2.79	1.54	1.25	0.81	36.2	29.2	UnDef	0.39
47.74	46.8	0.98	2.10	-7.0	6	114.6	2.85	1.56	1.28	0.80	17.9	14.3	3.52	0.40
48.72	60.7	0.86	1.42	-3.0	7	117.8	2.90	1.59	1.32	0.79	19.4	15.4	UnDef	0.18
49.70	44.1	0.45	1.02	-0.3	7	117.8	2.96	1.62	1.35	0.79	14.1	11.1	UnDef	0.13
50.69	50.4	0.84	1.66	13.8	7	117.8	3.02	1.64	1.38	0.78	16.1	12.5	UnDef	0.23
51.67	60.9	1.20	1.97	24.9	7	117.8	3.08	1.67	1.41	0.77	19.4	15.1	UnDef	0.29
52.66	106.7	1.06	0.99	4.7	8	120.9	3.14	1.70	1.44	0.77	25.5	19.6	UnDef	0.21
53.64	50.8	0.63	1.25	-4.6	7	117.8	3.19	1.73	1.47	0.76	16.2	12.3	UnDef	0.16
54.63	65.1	1.53	2.36	0.5	6	114.6	3.25	1.75	1.50	0.76	24.9	18.8	4.95	0.46
55.61	71.1	1.69	2.38	-0.3	6	114.6	3.31	1.78	1.53	0.75	27.2	20.4	5.42	0.45
56.59	133.2	2.36	1.77	-6.1	7	117.8	3.37	1.80	1.56	0.74	42.5	31.7	UnDef	0.41
57.58	157.0	2.38	1.52	-7.9	8	120.9	3.42	1.83	1.59	0.74	37.6	27.8	UnDef	0.45
58.56	109.0	2.03	1.87	-9.1	7	117.8	3.48	1.86	1.62	0.73	34.8	25.5	UnDef	0.35

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0207-1059-4864
Job No: 00-559SH
Client: BAGAHI ENGINEERING
Project: NEPTUNE MARINA
Site: NEPTUNE MARINA
Location: CPT-8
KEN BAGAHI
CPT Date: 00/01/02
CPT Time: 09:51
CPT File: 559C08.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 2.01 (ft): 6.6
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.49	5.0E-03	0.00	1000.0	0.82	10	224.0	0.0	224.0	0.0	50	95.0	1.0	-0.38	0.0	56.0
1.48	5.0E-04	0.00	1000.0	1.98	12	233.2	UnDef	UnDef	0.0	50	95.0	1.0	-0.51	UnDef	UnDef
2.46	5.0E-04	0.00	320.6	0.89	9	90.2	0.0	90.2	3.0	46	72.6	1.0	-0.28	0.0	30.1
3.44	5.0E-04	0.00	174.4	0.59	9	68.7	0.0	68.7	4.0	44	60.0	1.0	-0.19	0.0	22.9
4.43	5.0E-06	0.00	40.2	2.52	7	20.6	38.8	59.4	29.4	UnDef	UnDef	6.0	UnDef	7.0	17.1
5.41	5.0E-07	0.02	21.2	2.97	6	12.3	49.1	61.4	42.1	UnDef	UnDef	6.0	UnDef	8.0	16.0
6.40	5.0E-07	0.03	20.9	2.61	6	13.1	52.3	65.4	40.6	UnDef	UnDef	6.0	UnDef	8.5	17.1
7.30	5.0E-06	-0.01	36.9	2.92	6	23.6	66.2	89.8	32.6	UnDef	UnDef	6.0	UnDef	9.9	21.4
8.20	5.0E-08	-0.04	19.4	3.55	6	13.1	52.5	65.6	46.6	UnDef	UnDef	6.0	UnDef	12.8	25.7
9.19	5.0E-07	-0.04	14.1	2.84	6	10.0	40.1	50.2	49.6	UnDef	UnDef	6.0	UnDef	6.5	13.1
10.17	5.0E-07	-0.04	14.2	3.20	4	10.4	41.7	52.2	51.4	UnDef	UnDef	6.0	UnDef	6.8	13.6
11.15	5.0E-07	-0.04	11.9	2.17	6	9.2	36.6	45.8	49.3	UnDef	UnDef	3.0	UnDef	6.0	12.0
12.14	5.0E-05	-0.01	34.9	0.69	7	25.8	15.3	41.1	18.9	38	30.0	6.0	-0.06	3.1	13.2
13.21	5.0E-06	-0.04	12.9	1.59	6	10.4	41.8	52.2	43.4	UnDef	UnDef	6.0	UnDef	5.1	10.2
14.27	5.0E-03	-0.01	69.4	0.18	9	53.0	0.0	53.0	5.0	40	49.1	1.0	-0.01	0.0	13.0
15.26	5.0E-04	-0.01	42.8	0.38	9	33.9	0.0	33.9	5.0	38	36.3	1.0	-0.03	0.0	11.1
16.24	5.0E-04	-0.02	33.8	0.59	7	27.6	15.2	42.8	18.3	36	30.4	1.0	-0.04	2.6	11.6
17.22	5.0E-04	-0.01	46.1	0.54	9	38.1	12.3	50.4	14.1	38	39.6	1.0	-0.07	2.2	14.7
18.21	5.0E-05	-0.02	23.1	1.06	7	20.1	33.4	53.5	28.4	34	30.0	6.0	-0.06	5.0	12.9
19.19	5.0E-03	0.00	146.7	0.66	9	123.2	1.6	124.9	5.5	44	73.3	1.0	-0.18	0.2	30.4
20.18	5.0E-02	0.00	222.0	0.71	9	189.6	0.0	189.6	3.6	46	85.6	1.0	-0.23	0.0	37.1
21.16	5.0E-02	0.00	228.6	0.74	9	199.2	0.0	199.2	3.6	46	87.0	1.0	-0.24	0.0	39.0

Gregg In Situ, Inc.
Run No: 00-0207-1059-4864
CPT File: 559C08.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
22.15	5.0E-02	0.00	187.6	0.74	9	166.9	0.0	166.9	4.7	44	82.0	1.0	-0.22	0.0	32.7
23.13	5.0E-03	0.00	100.7	1.06	9	91.9	17.4	109.3	11.0	42	64.8	1.0	-0.19	2.5	25.0
24.11	5.0E-05	-0.02	20.9	1.48	6	20.6	64.7	85.3	33.4	34	30.0	6.0	-0.07	7.3	15.3
25.10	5.0E-05	-0.02	23.0	0.90	7	22.8	32.4	55.2	27.0	34	30.0	6.0	-0.04	5.2	14.1
26.08	5.0E-05	-0.01	21.6	1.71	6	21.8	81.2	103.0	34.5	34	30.0	6.0	-0.09	8.3	16.9
27.07	5.0E-04	-0.01	62.2	1.01	7	60.9	22.3	83.2	15.1	40	53.0	1.0	-0.14	4.0	23.9
28.05	5.0E-03	-0.01	110.0	1.08	9	107.9	18.2	126.1	10.4	42	69.5	1.0	-0.20	2.6	29.0
29.04	5.0E-02	-0.01	172.4	0.74	9	170.8	0.5	171.3	5.1	44	82.6	1.0	-0.21	0.1	33.5
30.02	5.0E-03	-0.01	104.2	0.92	9	105.4	15.3	120.8	9.8	42	68.8	1.0	-0.18	2.2	28.0
31.00	5.0E-05	-0.07	16.8	1.92	6	18.7	74.8	93.5	40.5	32	30.0	6.0	-0.07	7.3	14.6
31.99	5.0E-06	-0.07	16.2	3.35	4	18.3	73.2	91.5	49.2	UnDef	UnDef	6.0	UnDef	9.0	17.9
32.97	5.0E-05	-0.03	40.0	2.26	7	43.1	70.2	113.3	28.2	38	43.1	6.0	-0.18	10.7	27.5
33.96	5.0E-02	-0.01	103.0	0.61	9	109.5	8.0	117.4	7.5	42	69.9	1.0	-0.15	0.9	22.4
34.94	5.0E-02	-0.01	131.0	0.56	9	140.6	1.6	142.1	5.4	44	77.0	1.0	-0.16	0.2	27.7
35.92	5.0E-02	-0.01	165.2	0.81	9	179.1	4.1	183.2	5.8	44	84.0	1.0	-0.21	0.5	35.6
36.91	5.0E-02	0.00	272.5	0.73	9	297.9	0.0	297.9	2.8	46	95.0	1.0	-0.25	0.0	58.3
37.89	5.0E+00	0.00	386.7	0.62	10	427.2	0.0	427.2	0.8	48	95.0	1.0	-0.27	0.0	69.7
38.88	5.0E+00	0.00	265.2	0.39	10	297.3	0.0	297.3	0.7	46	95.0	1.0	-0.19	0.0	48.5
39.86	5.0E-02	0.00	233.4	1.05	9	265.0	2.8	267.8	5.4	46	95.0	1.0	-0.27	0.3	52.2
40.85	5.0E+00	0.00	270.5	0.63	9	310.4	0.0	310.4	2.2	46	95.0	1.0	-0.24	0.0	50.6
41.83	5.0E-02	0.00	308.3	0.79	9	357.6	0.0	357.6	2.7	46	95.0	1.0	-0.27	0.0	70.0
42.81	5.0E-02	0.00	359.8	0.98	9	421.5	0.0	421.5	3.1	48	95.0	1.0	-0.31	0.0	82.5
43.80	5.0E-02	0.00	309.0	1.37	9	366.1	6.1	372.2	5.6	46	95.0	1.0	-0.33	0.7	72.4
44.78	5.0E-03	0.00	111.8	1.18	9	135.1	25.1	160.3	10.9	42	75.9	1.0	-0.21	3.6	36.7
45.77	5.0E-03	-0.01	74.3	1.57	7	91.5	42.7	134.2	16.9	40	64.7	1.0	-0.20	5.6	27.9
46.75	5.0E-04	-0.01	72.0	2.10	7	89.5	60.2	149.7	20.1	40	64.1	1.0	-0.24	9.8	39.0
47.74	5.0E-05	-0.03	28.1	2.24	6	36.6	114.4	151.0	33.4	36	38.5	6.0	-0.14	12.9	27.3
48.72	5.0E-04	-0.02	36.4	1.49	7	47.1	53.9	101.0	25.0	38	45.7	1.0	-0.13	7.7	23.1
49.70	5.0E-04	-0.03	25.5	1.10	7	34.0	49.2	83.1	27.1	34	36.3	1.0	-0.07	6.5	17.6
50.69	5.0E-04	-0.02	28.8	1.76	7	38.5	78.8	117.2	30.2	36	39.9	1.0	-0.12	9.1	21.6
51.67	5.0E-04	-0.01	34.6	2.08	7	46.1	84.9	131.0	29.3	38	45.1	1.0	-0.15	10.3	25.3
52.66	5.0E-03	-0.01	61.0	1.02	7	80.1	30.7	110.8	15.4	40	60.9	1.0	-0.14	4.1	23.7
53.64	5.0E-04	-0.03	27.6	1.33	7	37.8	59.0	96.8	27.8	36	39.4	1.0	-0.09	7.6	19.9
54.63	5.0E-05	-0.02	35.3	2.48	6	48.1	111.2	159.3	31.1	38	46.3	6.0	-0.18	14.6	33.4
55.61	5.0E-05	-0.02	38.1	2.49	6	52.2	105.7	157.8	30.1	38	48.6	6.0	-0.19	14.7	35.1
56.59	5.0E-04	-0.01	72.0	1.81	7	97.0	55.3	152.4	18.6	40	66.4	1.0	-0.22	9.3	41.0
57.58	5.0E-03	-0.01	83.8	1.55	7	113.5	44.9	158.4	15.6	42	70.9	1.0	-0.22	6.0	33.8
58.56	5.0E-04	-0.02	56.7	1.93	7	78.2	64.3	142.4	21.9	40	60.2	1.0	-0.20	10.0	35.5

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0207-1059-4892
Job No: 00-559SH
Client: BAGAHI ENGINEERING
Project: NEPTUNE MARINA
Site: NEPTUNE MARINA
Location: CPT-9
KEN BAGAHI
CPT Date: 00/01/02
CPT Time: 14:08
CPT File: 559C09.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
0.49	98.6	0.27	0.27	-0.2	9	124.1	0.03	0.03	0.00	2.00	18.9	37.8	UnDef	0.00
1.48	109.9	0.38	0.34	-0.2	9	124.1	0.09	0.09	0.00	2.00	21.1	42.1	UnDef	0.00
2.46	184.5	0.70	0.38	0.0	9	124.1	0.15	0.15	0.00	2.00	35.3	70.7	UnDef	0.00
3.44	231.1	0.88	0.38	0.0	9	124.1	0.21	0.21	0.00	2.00	44.3	88.5	UnDef	0.00
4.43	174.9	1.06	0.61	0.3	9	124.1	0.27	0.26	0.01	1.96	33.5	65.5	UnDef	0.00
5.41	147.0	1.09	0.74	0.5	9	124.1	0.34	0.29	0.04	1.85	28.1	52.1	UnDef	0.00
6.40	142.1	1.01	0.71	-1.5	9	124.1	0.40	0.32	0.07	1.76	27.2	47.9	UnDef	0.00
7.30	176.5	1.09	0.62	-6.9	9	124.1	0.45	0.35	0.10	1.69	33.8	57.1	UnDef	0.00
8.20	187.5	1.24	0.66	-14.4	9	124.1	0.51	0.38	0.13	1.63	35.9	58.4	UnDef	0.00
9.19	101.9	0.99	0.97	-15.2	8	120.9	0.57	0.41	0.16	1.57	24.4	38.2	UnDef	0.43
10.17	32.8	0.30	0.93	-14.7	7	117.8	0.63	0.44	0.19	1.52	10.5	15.9	UnDef	0.10
11.15	11.4	0.03	0.25	-8.8	6	114.6	0.69	0.46	0.22	1.47	4.4	6.4	0.86	0.00
12.14	7.2	0.02	0.28	-5.8	1	79.6	0.73	0.48	0.25	1.45	3.5	5.0	0.52	0.00
13.21	7.7	0.02	0.26	-5.6	1	79.6	0.78	0.49	0.29	1.43	3.7	5.3	0.55	0.00
14.27	5.6	0.02	0.36	-3.1	1	79.6	0.82	0.50	0.32	1.42	2.7	3.8	0.39	0.09
15.26	13.5	0.02	0.15	-1.1	6	114.6	0.87	0.51	0.35	1.39	5.2	7.2	1.01	0.00
16.24	49.3	0.02	0.04	2.4	8	120.9	0.92	0.54	0.38	1.36	11.8	16.0	UnDef	0.11
17.22	75.9	0.27	0.35	4.2	8	120.9	0.98	0.57	0.41	1.32	18.2	24.1	UnDef	0.17
18.21	81.0	0.28	0.35	-1.2	8	120.9	1.04	0.60	0.44	1.29	19.4	25.1	UnDef	0.18
19.19	28.9	0.11	0.39	2.1	7	117.8	1.10	0.63	0.47	1.26	9.2	11.7	UnDef	0.08
20.18	24.6	0.05	0.19	3.7	7	117.8	1.16	0.65	0.51	1.24	7.9	9.7	UnDef	0.00
21.16	107.6	0.39	0.37	0.7	9	124.1	1.22	0.68	0.54	1.21	20.6	24.9	UnDef	0.27

Gregg In Situ, Inc.
Run No: 00-0207-1059-4892
CPT File: 559C09.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
22.15	207.5	1.24	0.60	2.9	9	124.1	1.28	0.71	0.57	1.18	39.7	47.1	UnDef	0.00
23.13	221.3	1.74	0.79	-0.3	9	124.1	1.34	0.74	0.60	1.16	42.4	49.2	UnDef	0.00
24.11	211.9	1.81	0.85	-2.4	9	124.1	1.40	0.77	0.63	1.14	40.6	46.1	UnDef	0.00
25.10	196.2	1.62	0.83	-0.4	9	124.1	1.46	0.80	0.66	1.12	37.6	41.9	UnDef	0.00
26.08	138.4	0.73	0.53	0.8	9	124.1	1.52	0.83	0.69	1.09	26.5	29.0	UnDef	0.38
27.07	47.7	0.39	0.82	3.9	7	117.8	1.58	0.86	0.72	1.08	15.2	16.4	UnDef	0.11
28.05	10.0	0.06	0.63	25.6	6	114.6	1.64	0.89	0.75	1.06	3.8	4.1	0.67	0.09
29.04	9.6	0.04	0.36	42.8	6	114.6	1.70	0.92	0.78	1.05	3.7	3.9	0.64	0.09
30.02	12.8	0.02	0.16	54.3	6	114.6	1.75	0.94	0.81	1.03	4.9	5.0	0.88	0.00
31.00	11.1	0.07	0.65	41.0	6	114.6	1.81	0.97	0.84	1.02	4.2	4.3	0.74	0.10
31.99	10.2	0.08	0.80	52.4	6	114.6	1.87	0.99	0.87	1.00	3.9	3.9	0.66	0.09
32.97	12.8	0.09	0.72	55.0	6	114.6	1.92	1.02	0.90	0.99	4.9	4.9	0.87	0.10
33.96	14.2	0.09	0.64	39.1	6	114.6	1.98	1.04	0.94	0.98	5.4	5.3	0.98	0.11
34.94	19.5	0.19	0.98	49.4	6	114.6	2.04	1.07	0.97	0.97	7.5	7.2	1.39	0.14
35.92	26.9	0.41	1.52	14.9	6	114.6	2.09	1.10	1.00	0.96	10.3	9.8	1.98	0.18
36.91	103.5	1.03	0.99	-20.9	8	120.9	2.15	1.12	1.03	0.94	24.8	23.4	UnDef	0.23
37.89	82.2	1.57	1.91	-28.0	7	117.8	2.21	1.15	1.06	0.93	26.2	24.5	UnDef	0.26
38.88	117.0	3.06	2.62	-29.7	7	117.8	2.27	1.18	1.09	0.92	37.3	34.4	UnDef	0.00
39.86	301.6	3.29	1.09	-30.7	9	124.1	2.33	1.21	1.12	0.91	57.8	52.6	UnDef	0.00
40.85	273.9	3.29	1.20	-21.7	9	124.1	2.39	1.24	1.15	0.90	52.5	47.2	UnDef	0.00
41.83	304.2	1.92	0.63	-27.7	9	124.1	2.45	1.27	1.18	0.89	58.3	51.8	UnDef	0.00
42.81	254.4	1.66	0.65	-28.3	9	124.1	2.51	1.30	1.21	0.88	48.7	42.8	UnDef	0.00
43.80	161.8	1.25	0.77	-26.7	9	124.1	2.57	1.33	1.24	0.87	31.0	26.9	UnDef	0.38
44.78	177.0	0.66	0.38	-26.4	9	124.1	2.63	1.36	1.27	0.86	33.9	29.1	UnDef	0.39
45.77	239.4	0.90	0.37	-22.0	10	127.3	2.69	1.39	1.30	0.85	38.2	32.4	UnDef	0.00
46.75	344.9	1.70	0.49	-18.6	10	127.3	2.76	1.42	1.33	0.84	55.1	46.2	UnDef	0.00
47.74	76.0	1.01	1.33	-5.9	7	117.8	2.82	1.45	1.37	0.83	24.3	20.1	UnDef	0.18
48.72	70.3	0.84	1.19	-21.9	7	117.8	2.87	1.48	1.40	0.82	22.4	18.5	UnDef	0.16

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 00-0207-1059-4892
Job No: 00-559SH
Client: BAGAHI ENGINEERING
Project: NEPTUNE MARINA
Site: NEPTUNE MARINA
Location: CPT-9
KEN BAGAHI
CPT Date: 00/01/02
CPT Time: 14:08
CPT File: 559C09.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.30
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.49	5.0E-02	0.00	1000.0	0.27	10	188.8	0.0	188.8	0.0	50	95.0	1.0	-0.28	0.0	37.8
1.48	5.0E-02	0.00	1000.0	0.34	10	210.6	0.0	210.6	0.0	50	95.0	1.0	-0.30	0.0	42.1
2.46	5.0E-02	0.00	1000.0	0.38	10	353.4	0.0	353.4	0.0	50	95.0	1.0	-0.31	0.0	70.7
3.44	5.0E-02	0.00	1000.0	0.38	10	442.7	0.0	442.7	0.0	50	95.0	1.0	-0.31	0.0	88.5
4.43	5.0E-02	0.00	668.0	0.61	10	334.8	0.0	334.8	0.0	50	95.0	1.0	-0.31	0.0	65.5
5.41	5.0E-02	0.00	502.4	0.74	10	266.2	0.0	266.2	0.8	48	95.0	1.0	-0.31	0.0	52.1
6.40	5.0E-02	0.00	439.7	0.72	9	244.9	0.0	244.9	1.0	48	93.0	1.0	-0.29	0.0	47.9
7.30	5.0E-02	0.00	502.9	0.62	10	291.9	0.0	291.9	0.1	48	95.0	1.0	-0.29	0.0	57.1
8.20	5.0E-02	0.00	495.0	0.67	10	298.6	0.0	298.6	0.4	48	95.0	1.0	-0.30	0.0	58.4
9.19	5.0E-03	-0.01	248.6	0.98	9	156.2	0.0	156.2	4.7	46	80.1	1.0	-0.27	0.0	38.2
10.17	5.0E-04	-0.02	73.9	0.94	9	48.7	13.0	61.7	12.9	40	46.6	1.0	-0.16	2.4	18.3
11.15	5.0E-05	-0.05	23.2	0.27	7	16.4	0.0	16.4	5.0	34	30.0	6.0	0.05	0.0	6.4
12.14	1.0E-07	-0.07	13.5	0.31	7	10.2	0.0	10.2	5.0	UnDef	UnDef	6.0	UnDef	0.0	5.0
13.21	1.0E-07	-0.07	14.2	0.29	7	10.8	0.0	10.8	5.0	UnDef	UnDef	6.0	UnDef	0.0	5.3
14.27	1.0E-07	-0.09	9.7	0.42	7	7.8	31.3	39.1	36.4	UnDef	UnDef	3.0	UnDef	3.8	7.7
15.26	5.0E-05	-0.03	24.5	0.16	7	18.4	0.0	18.4	5.0	34	30.0	6.0	0.08	0.0	7.2
16.24	5.0E-03	-0.01	89.3	0.04	9	65.5	0.0	65.5	3.2	42	55.1	1.0	0.09	0.0	16.0
17.22	5.0E-03	0.00	131.3	0.36	9	98.3	0.0	98.3	3.7	44	66.8	1.0	-0.12	0.0	24.1
18.21	5.0E-03	-0.01	133.5	0.36	9	102.4	0.0	102.4	3.6	44	68.0	1.0	-0.12	0.0	25.1
19.19	5.0E-04	-0.01	44.3	0.41	9	35.7	0.0	35.7	5.0	38	37.8	1.0	-0.04	0.0	11.7
20.18	5.0E-04	-0.02	35.8	0.20	9	29.8	0.0	29.8	5.0	38	32.5	1.0	0.03	0.0	9.7
21.16	5.0E-02	0.00	155.7	0.37	9	127.4	0.0	127.4	2.9	44	74.2	1.0	-0.14	0.0	24.9

Gregg In Situ, Inc.
Run No: 00-0207-1059-4892
CPT File: 559C09.COR

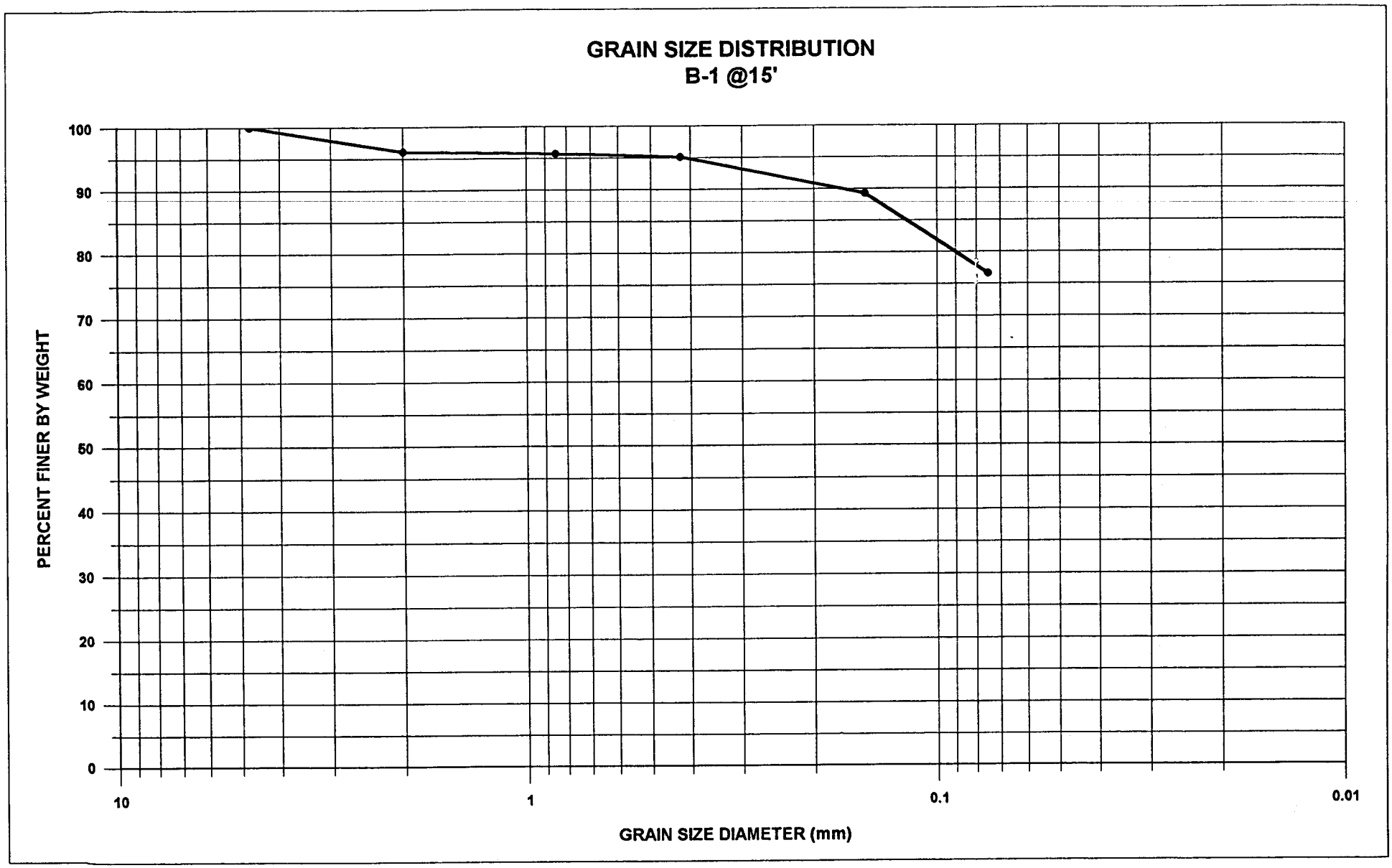
Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	SBTn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
22.15	5.0E-02	0.00	289.0	0.60	9	240.4	0.0	240.4	1.8	46	92.4	1.0	-0.24	0.0	47.1
23.13	5.0E-02	0.00	295.8	0.79	9	251.1	0.0	251.1	2.8	46	93.7	1.0	-0.27	0.0	49.2
24.11	5.0E-02	0.00	272.0	0.86	9	235.7	0.0	235.7	3.6	46	91.9	1.0	-0.27	0.0	46.1
25.10	5.0E-02	0.00	242.0	0.83	9	214.0	0.0	214.0	4.0	46	89.1	1.0	-0.25	0.0	41.9
26.08	5.0E-02	0.00	163.9	0.54	9	148.2	0.0	148.2	3.9	44	78.6	1.0	-0.18	0.0	29.0
27.07	5.0E-04	-0.01	53.4	0.85	7	50.2	19.4	69.6	15.4	40	47.5	1.0	-0.12	3.5	19.8
28.05	5.0E-05	0.01	9.4	0.76	6	10.4	41.5	51.9	42.0	30	30.0	3.0	0.06	4.1	8.1
29.04	5.0E-05	0.07	8.7	0.44	6	9.9	39.5	49.3	39.1	30	30.0	3.0	0.11	3.9	7.7
30.02	5.0E-05	0.08	11.7	0.18	7	12.9	0.0	12.9	5.0	30	30.0	3.0	0.15	0.0	5.0
31.00	5.0E-05	0.05	9.6	0.78	6	11.0	44.1	55.1	41.8	30	30.0	3.0	0.06	4.3	8.6
31.99	5.0E-05	0.09	8.4	0.98	6	10.0	40.0	50.0	47.2	30	30.0	3.0	0.06	3.9	7.8
32.97	5.0E-05	0.07	10.7	0.84	6	12.4	49.8	62.2	40.2	30	30.0	3.0	0.04	4.9	9.7
33.96	5.0E-05	0.02	11.7	0.74	6	13.6	54.4	68.0	37.2	30	30.0	3.0	0.04	5.3	10.6
34.94	5.0E-05	0.03	16.3	1.09	6	18.4	69.8	88.2	34.6	32	30.0	6.0	-0.02	7.1	14.3
35.92	5.0E-05	-0.02	22.6	1.64	6	25.1	77.4	102.6	33.3	34	30.0	6.0	-0.09	8.8	18.6
36.91	5.0E-03	-0.02	90.3	1.01	9	95.6	20.4	116.0	11.6	42	66.0	1.0	-0.18	2.9	26.3
37.89	5.0E-04	-0.02	69.5	1.96	7	75.0	48.7	123.7	19.8	40	59.0	1.0	-0.23	8.0	32.5
38.88	5.0E-04	-0.02	97.4	2.67	7	105.5	66.6	172.1	19.5	42	68.8	1.0	-0.31	11.0	45.4
39.86	5.0E-02	-0.01	248.1	1.10	9	268.7	2.5	271.2	5.3	46	95.0	1.0	-0.28	0.3	52.9
40.85	5.0E-02	-0.01	219.5	1.21	9	241.0	10.6	251.6	6.6	46	92.5	1.0	-0.28	1.3	48.5
41.83	5.0E-02	-0.01	238.1	0.64	9	264.5	0.0	264.5	2.8	46	95.0	1.0	-0.23	0.0	51.8
42.81	5.0E-02	-0.01	194.1	0.66	9	218.5	0.0	218.5	3.9	44	89.7	1.0	-0.21	0.0	42.8
43.80	5.0E-02	-0.01	119.9	0.78	9	137.4	10.9	148.3	7.7	42	76.4	1.0	-0.18	1.3	28.2
44.78	5.0E-02	-0.01	128.4	0.38	9	148.6	0.0	148.6	4.0	44	78.6	1.0	-0.13	0.0	29.1
45.77	5.0E+00	-0.01	170.4	0.38	9	198.7	0.0	198.7	2.5	44	87.0	1.0	-0.15	0.0	32.4
46.75	5.0E+00	-0.01	240.7	0.50	9	283.1	0.0	283.1	1.8	46	95.0	1.0	-0.21	0.0	46.2
47.74	5.0E-04	-0.02	50.4	1.38	7	61.7	41.2	102.9	20.0	38	53.5	1.0	-0.15	6.7	26.9
48.72	5.0E-04	-0.03	45.6	1.24	7	56.6	38.9	95.5	20.3	38	51.0	1.0	-0.13	6.3	24.8

APPENDIX G2
PREVIOUS LABORATORY TESTING DATA BY BAGAHI ENGINEERING

Project: NEPTUNE MARINA

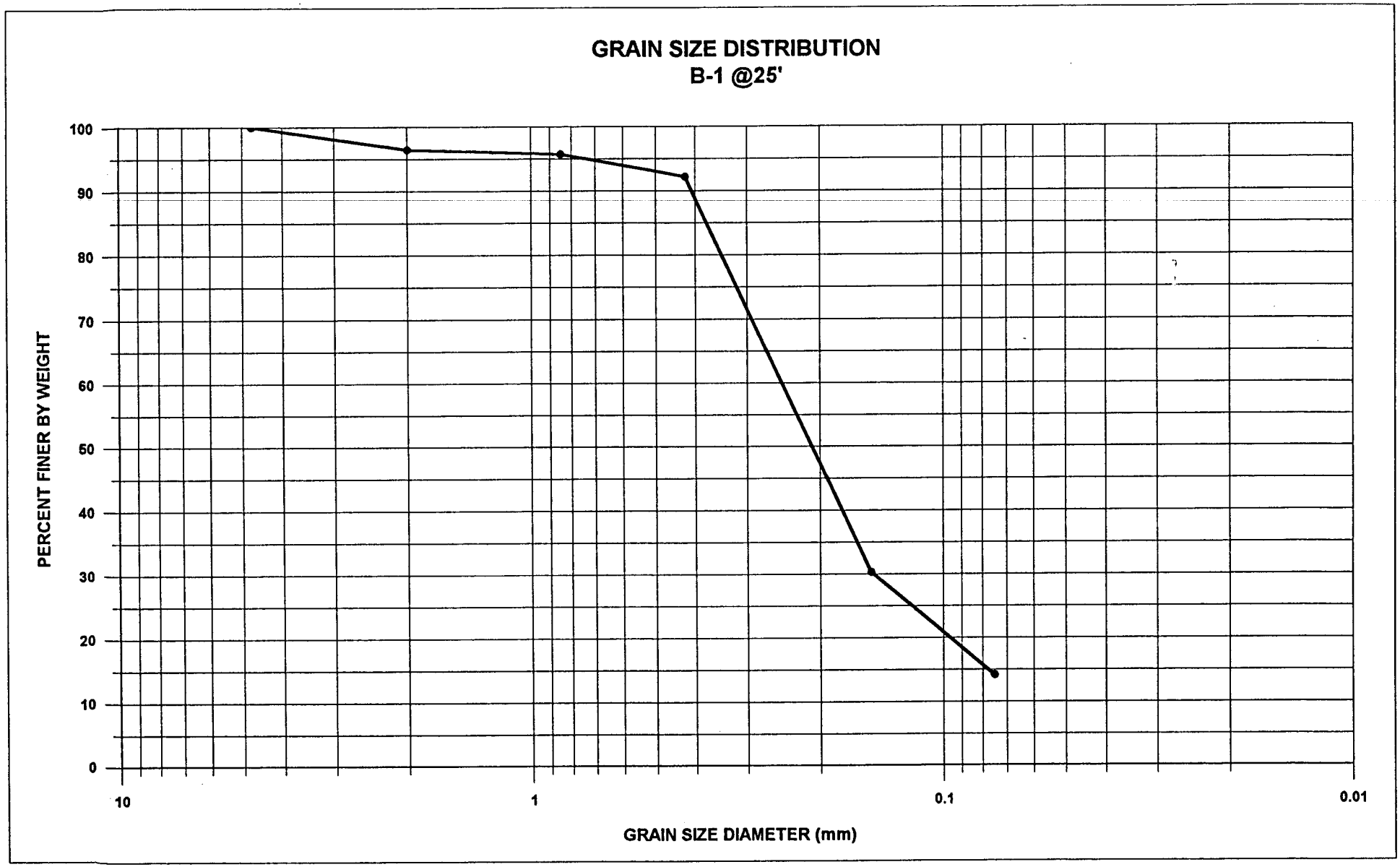
Job No.: 99m-200

01/26/2000



BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA Job No.: 99m-200 01/31/2000



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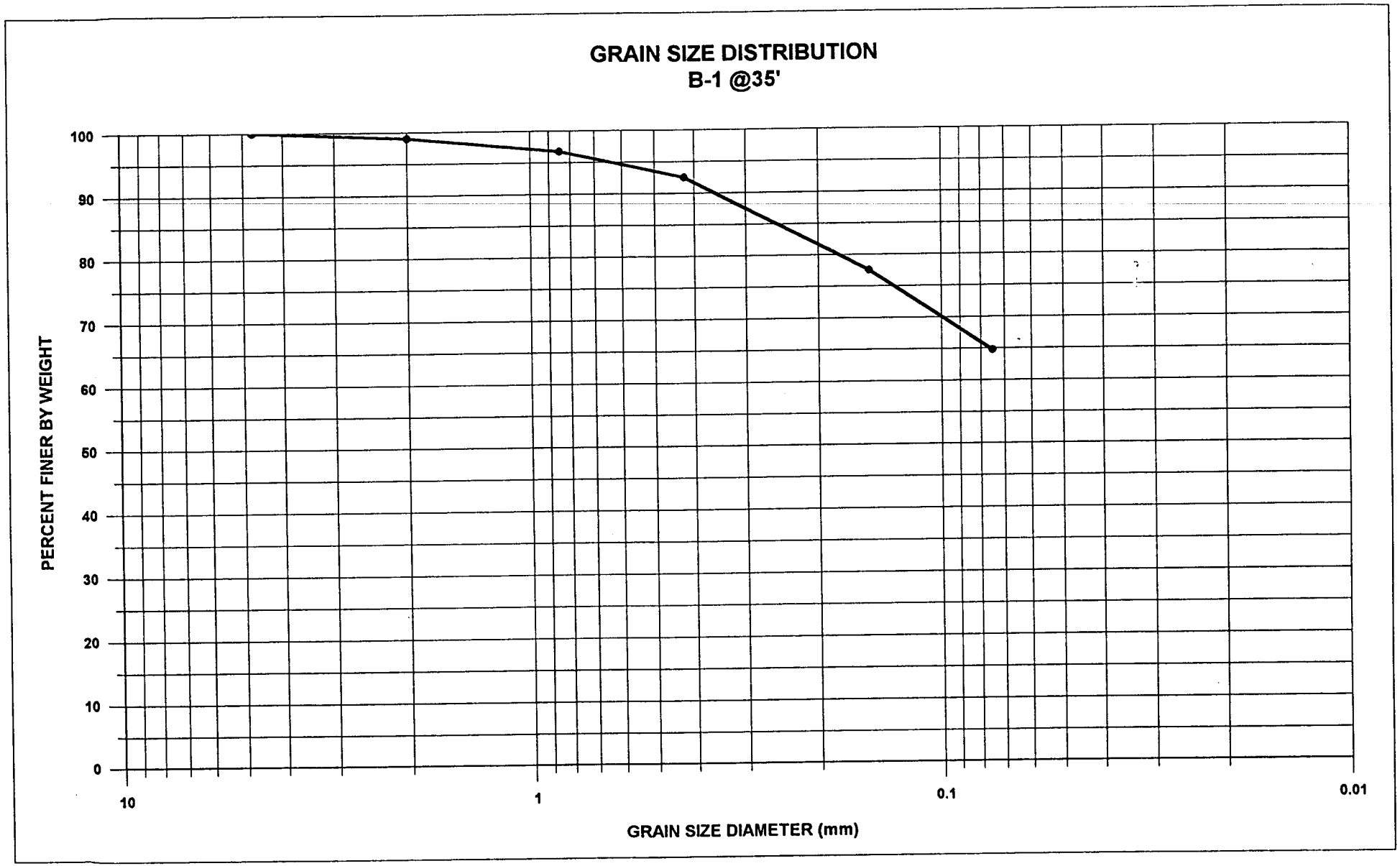
Project: NEPTUNE MARINA

Job No.: 99m-200

01/31/2000



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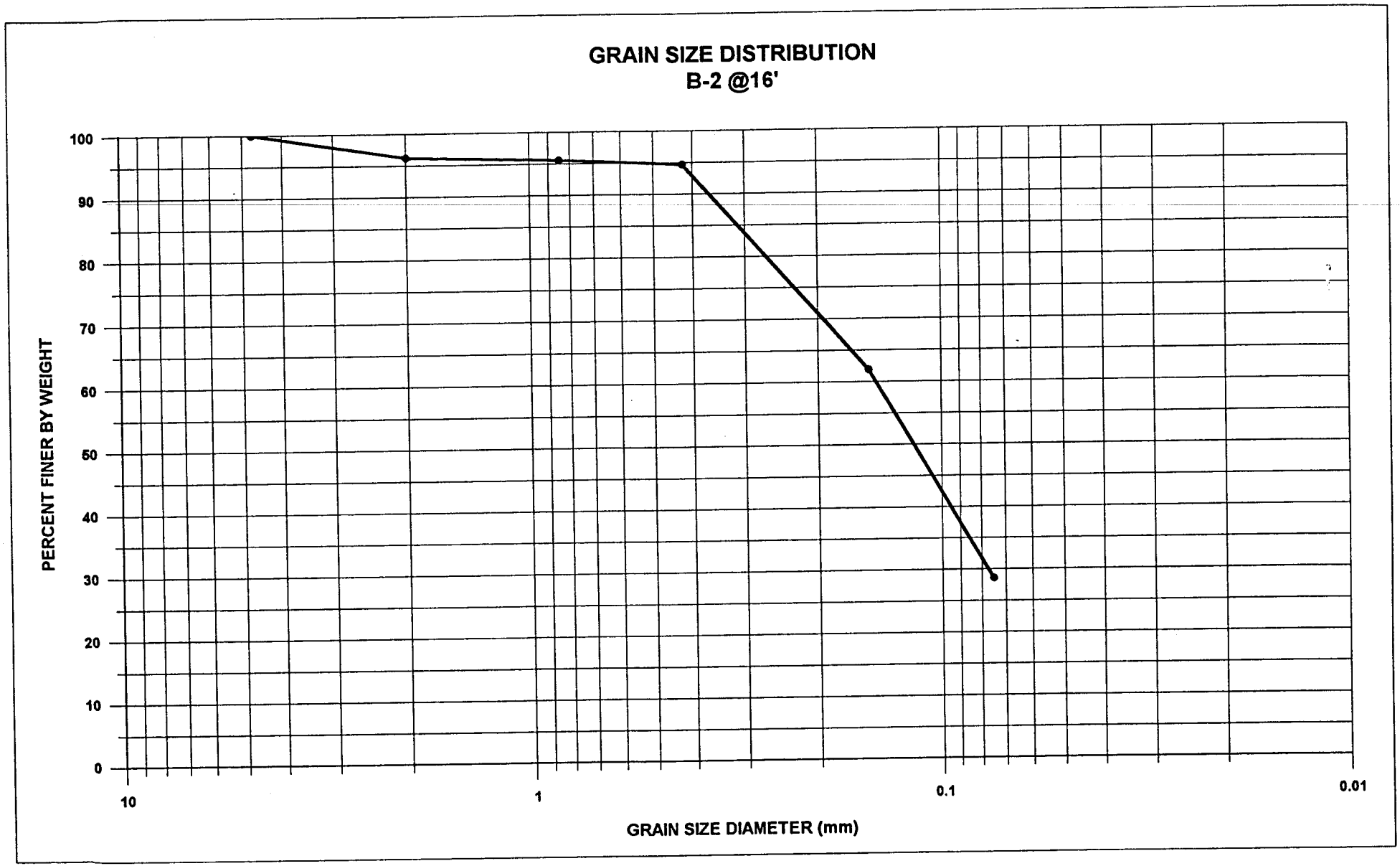
Project: NEPTUNE MARINA

Job No.: 99m-200

01/26/2000



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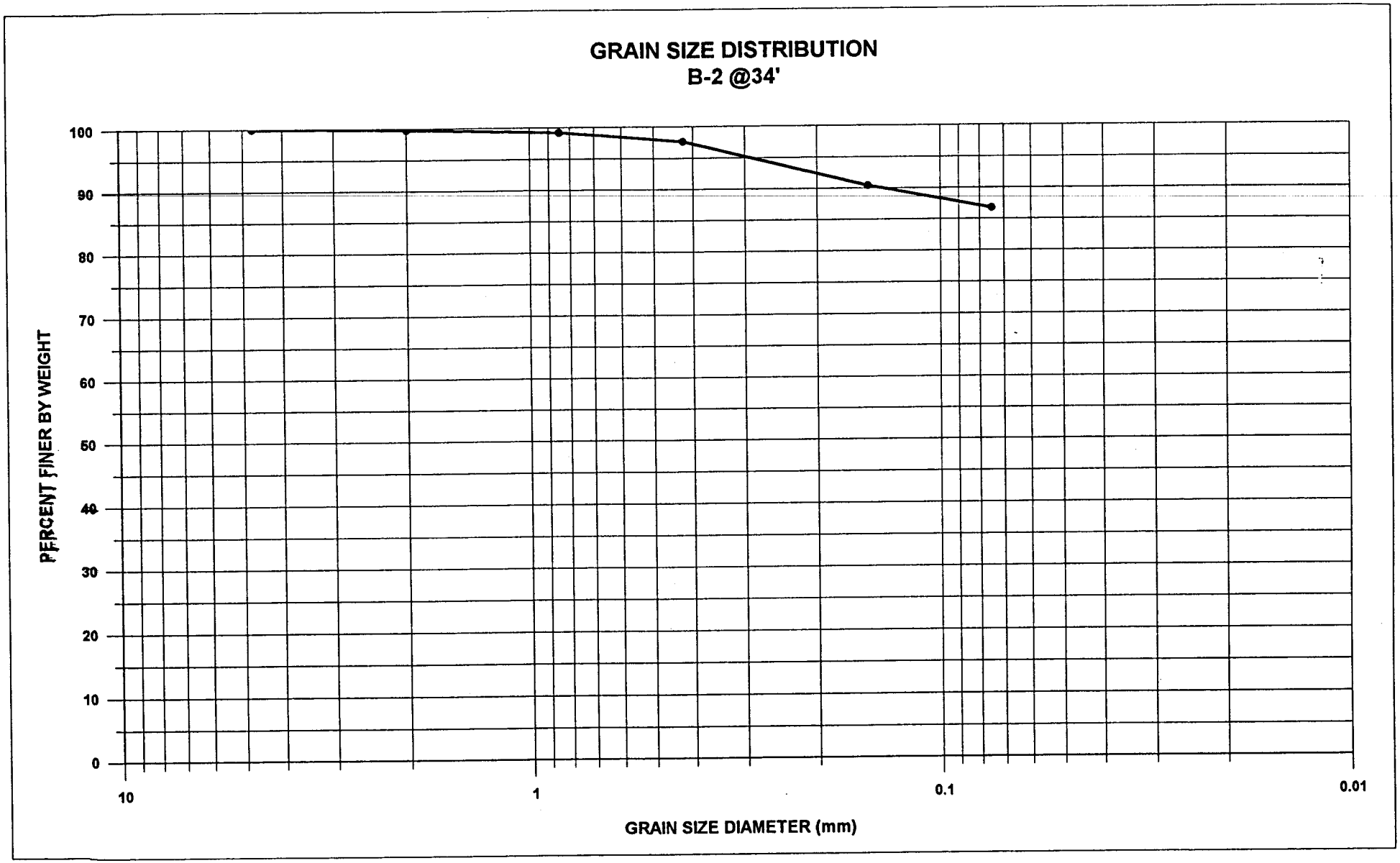
Project: NEPTUNE MARINA

Job No.: 99m-200

01/26/2000

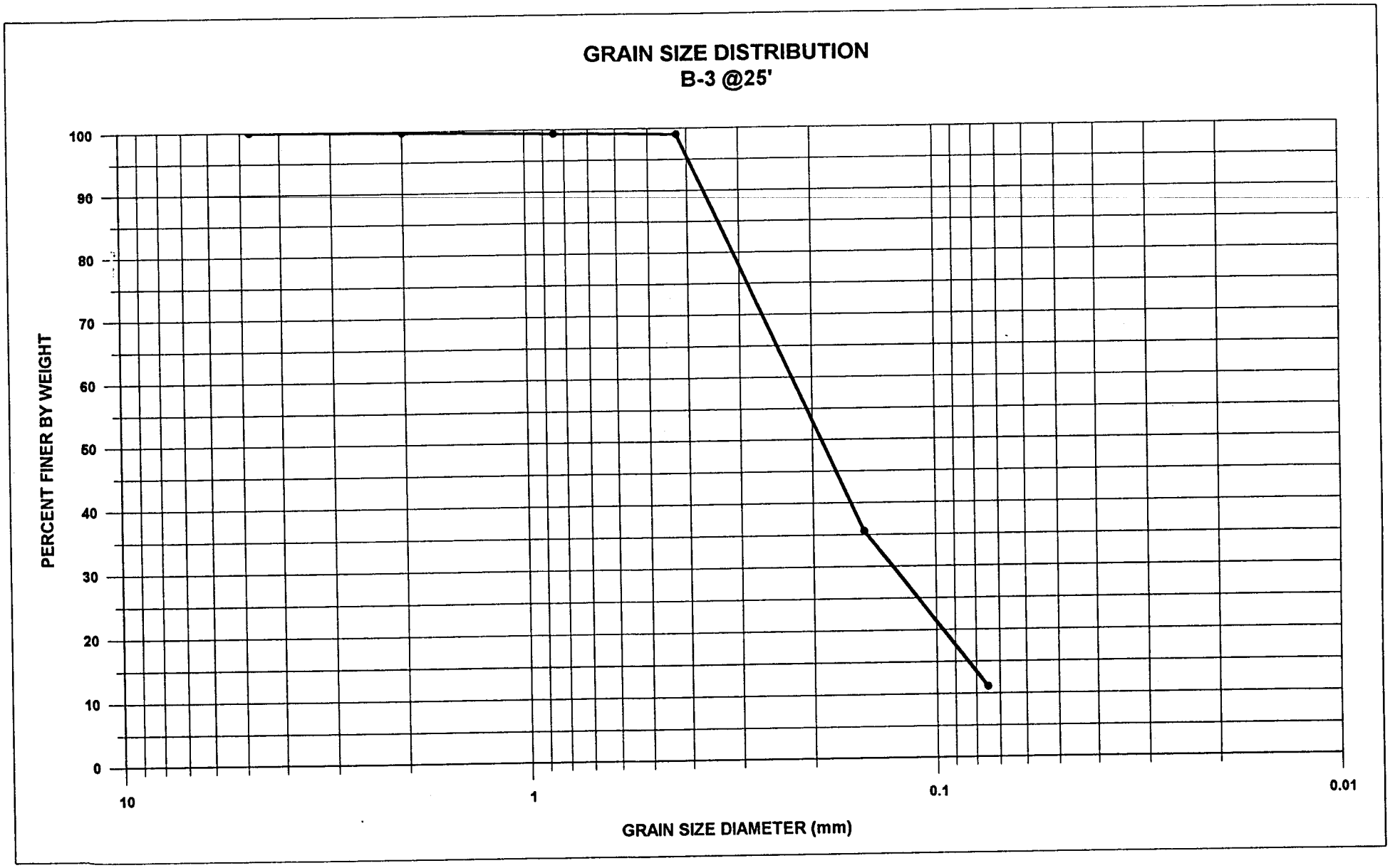


BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA

Job No.: 99m-200

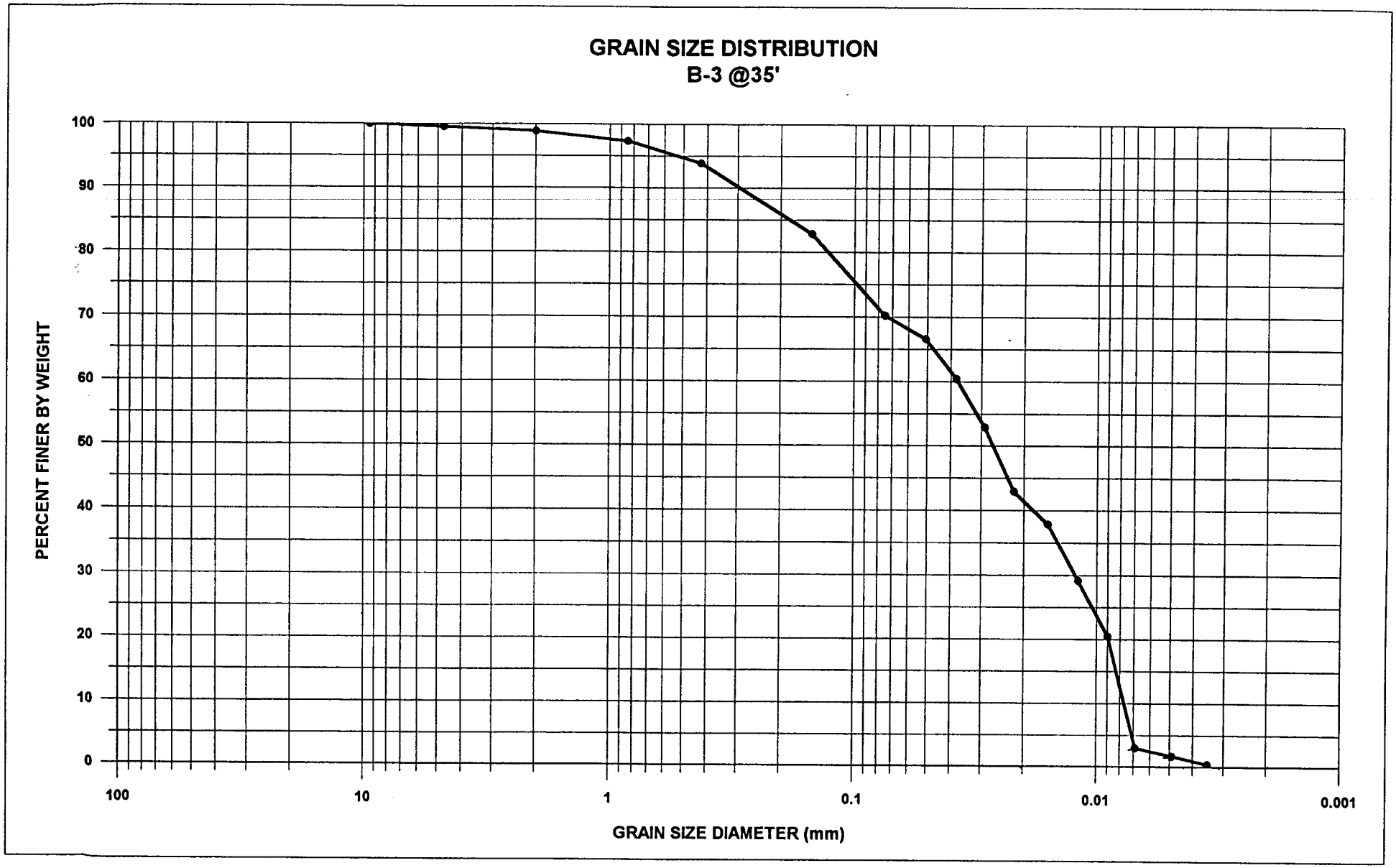
01/26/2000



BAGAHI ENGINEERING INC.

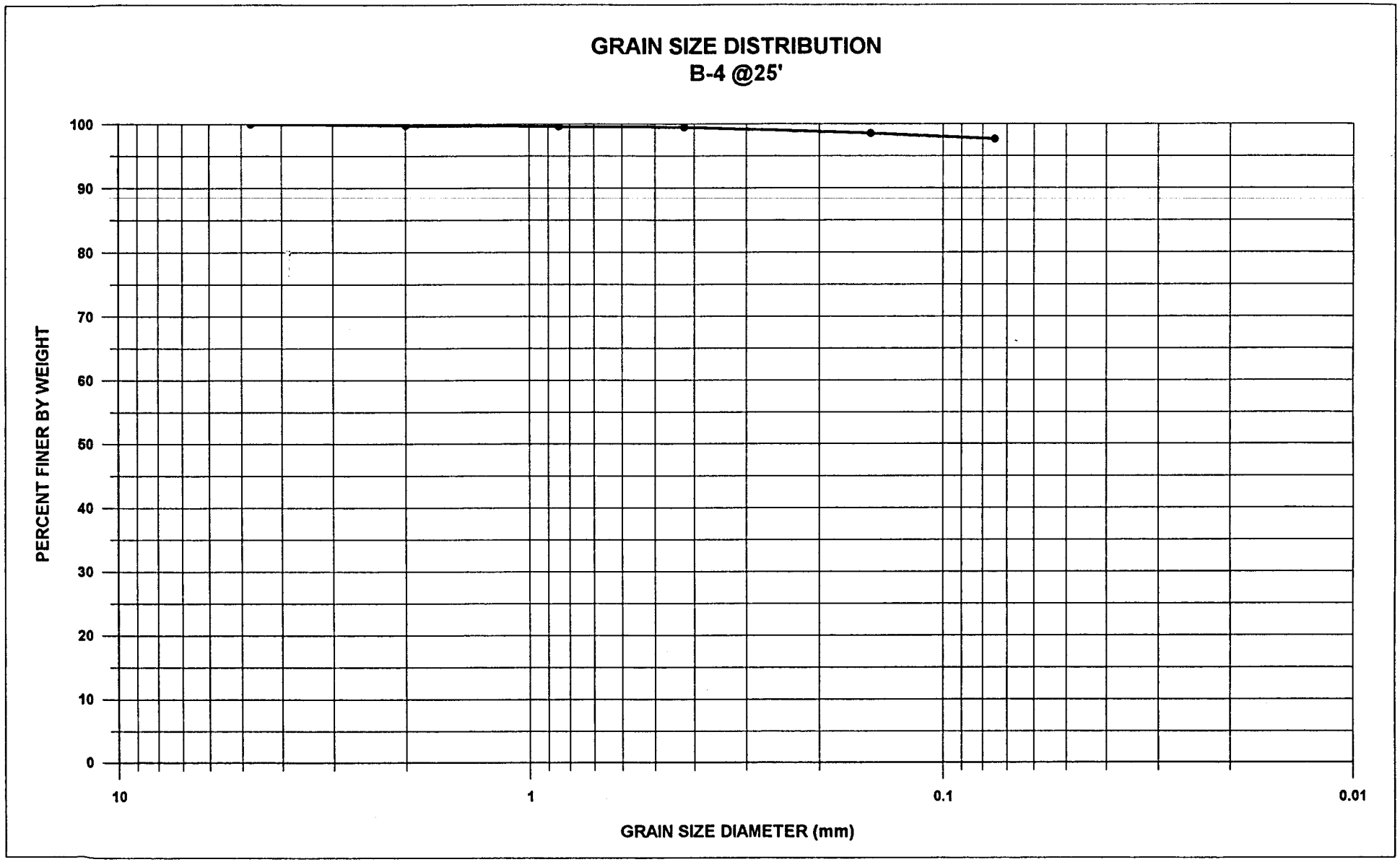
Project: NEPTUNE MARINA

Job No.: 99m-200



BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA Job No.: 99m-200 01/26/2000

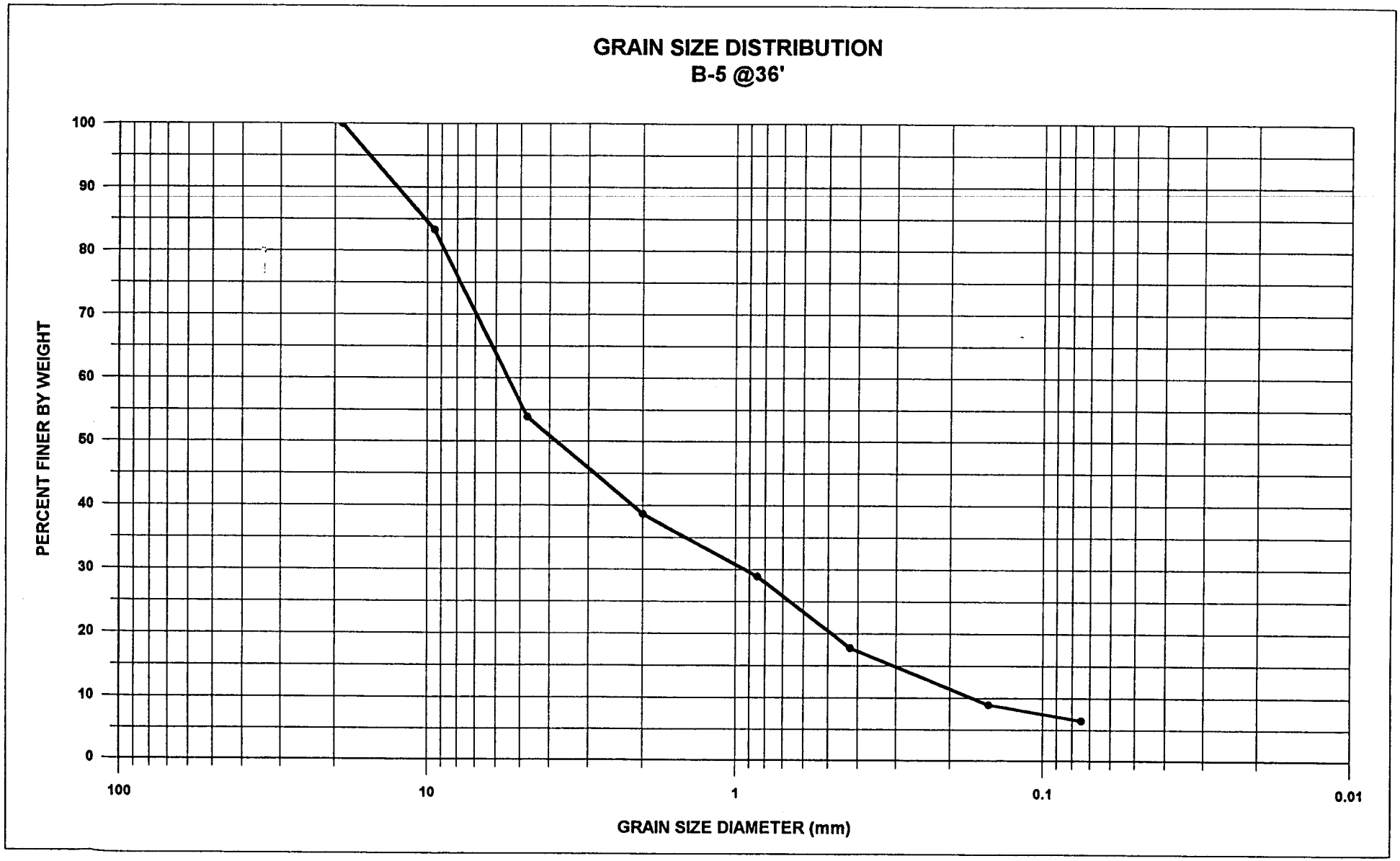


BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA

Job No.: 99m-200

01/26/2000

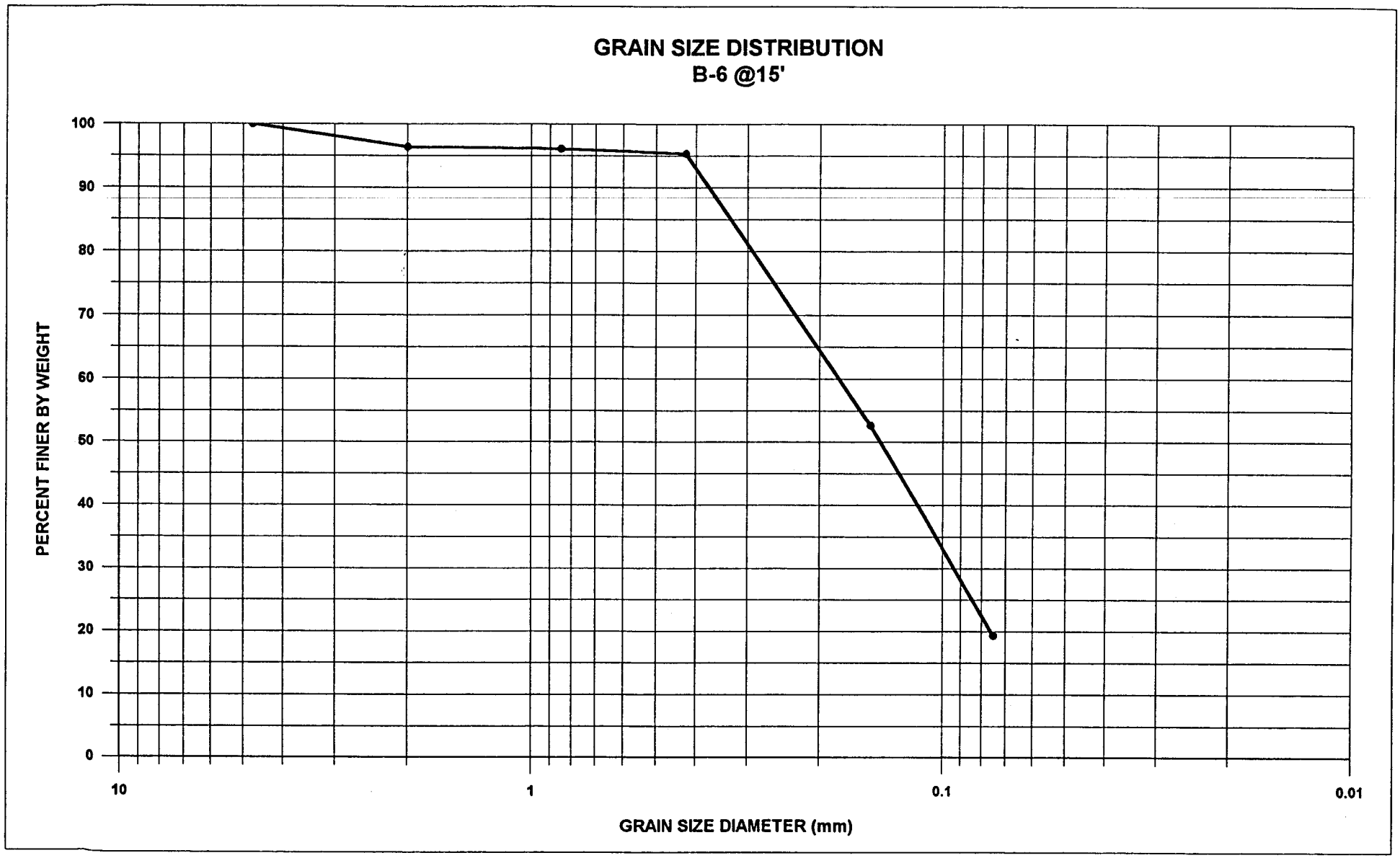


BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA

Job No.: 99m-200

01/26/2000

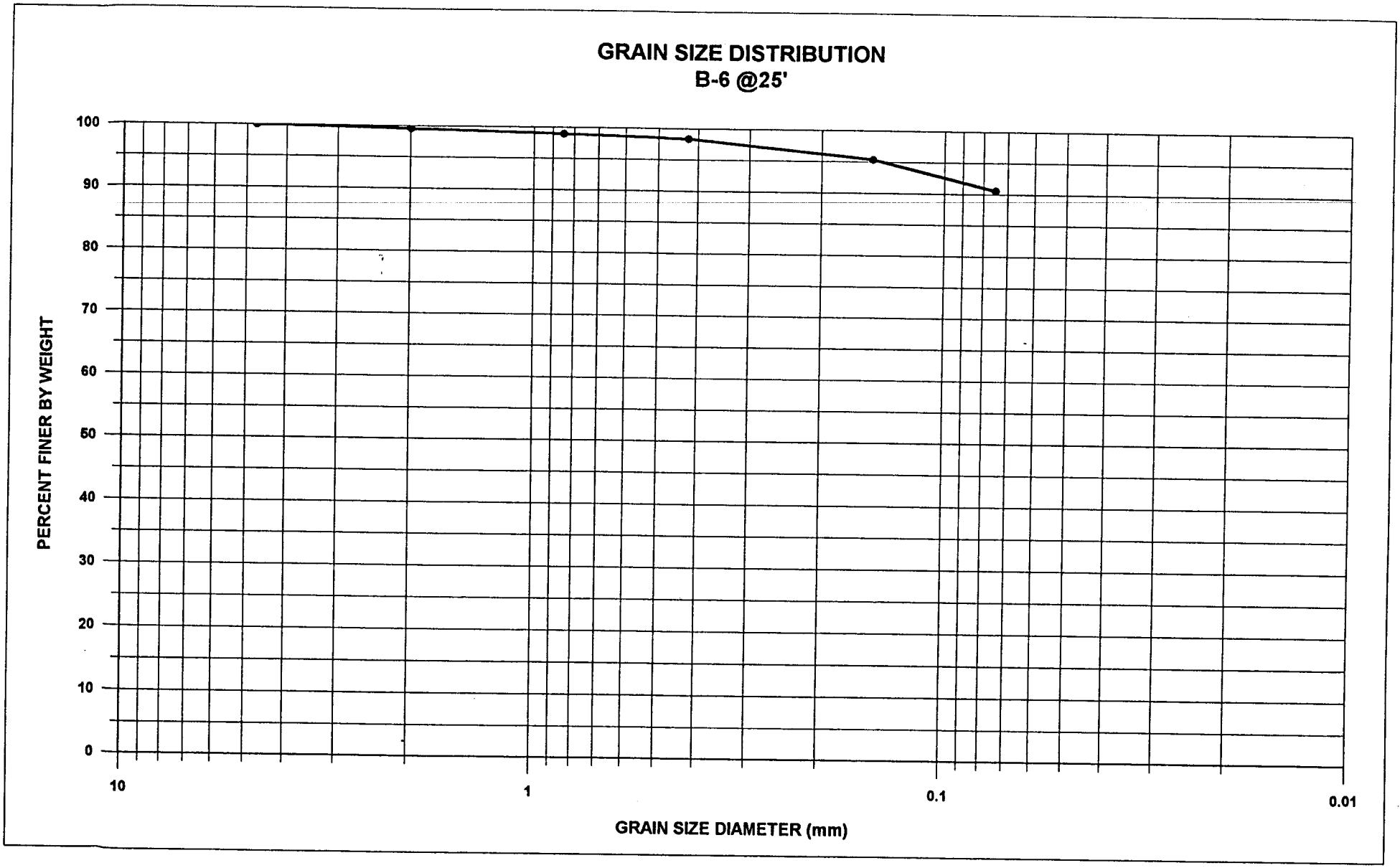


BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA

Job No.: 99m-200

01/26/2000

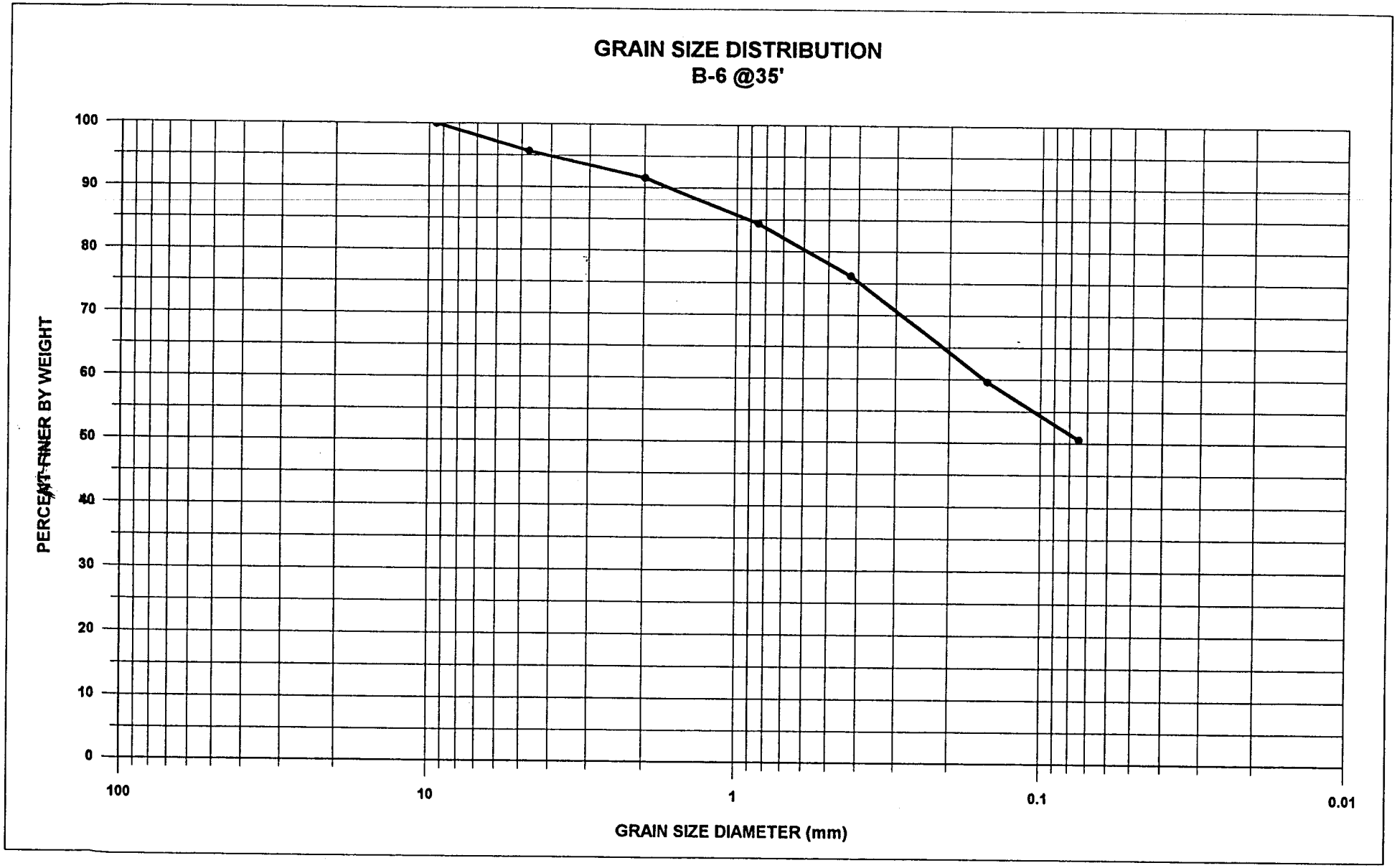


BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA

Job No.: 99m-200

01/31/2000

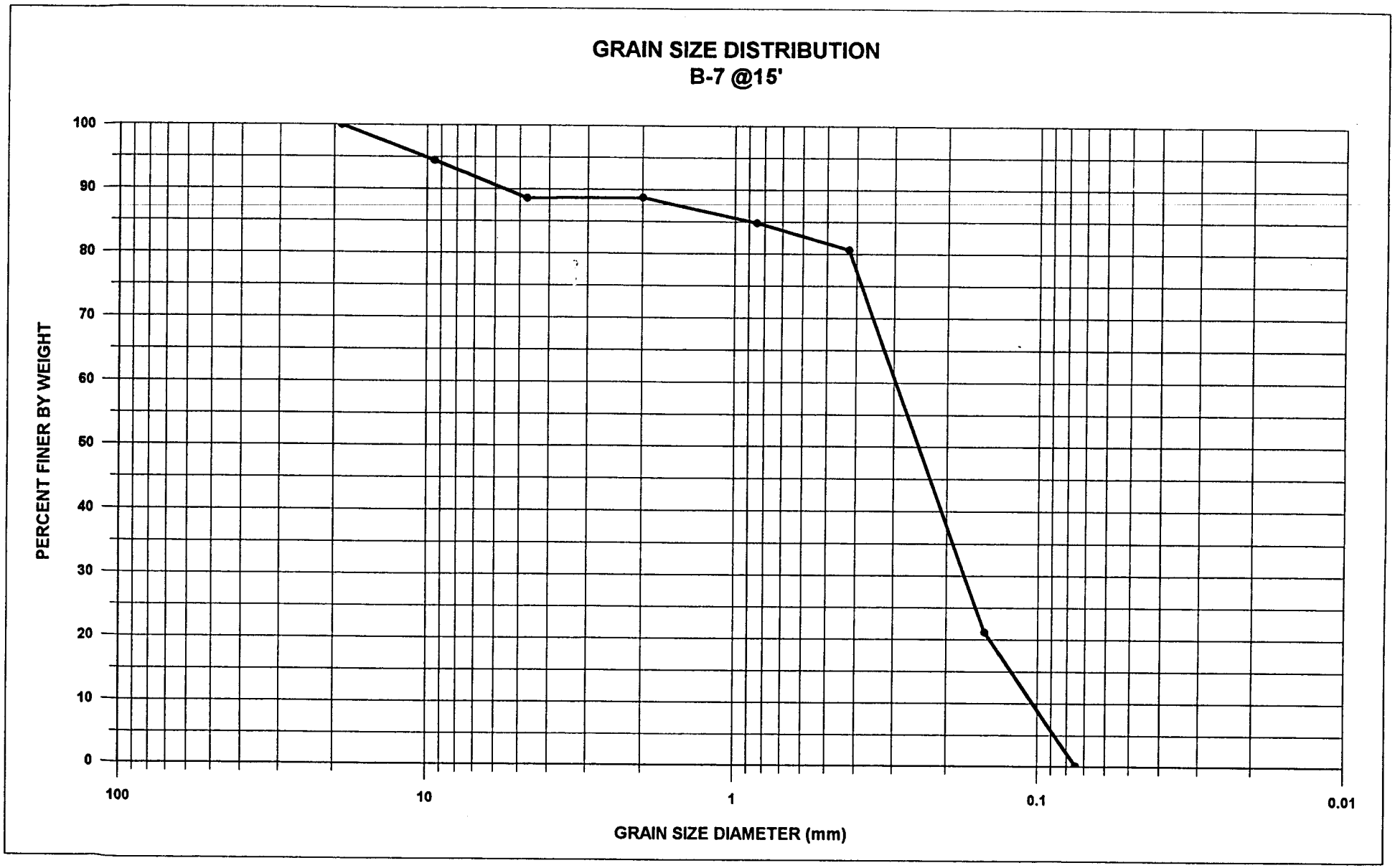


BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA

Job No.: 99m-200

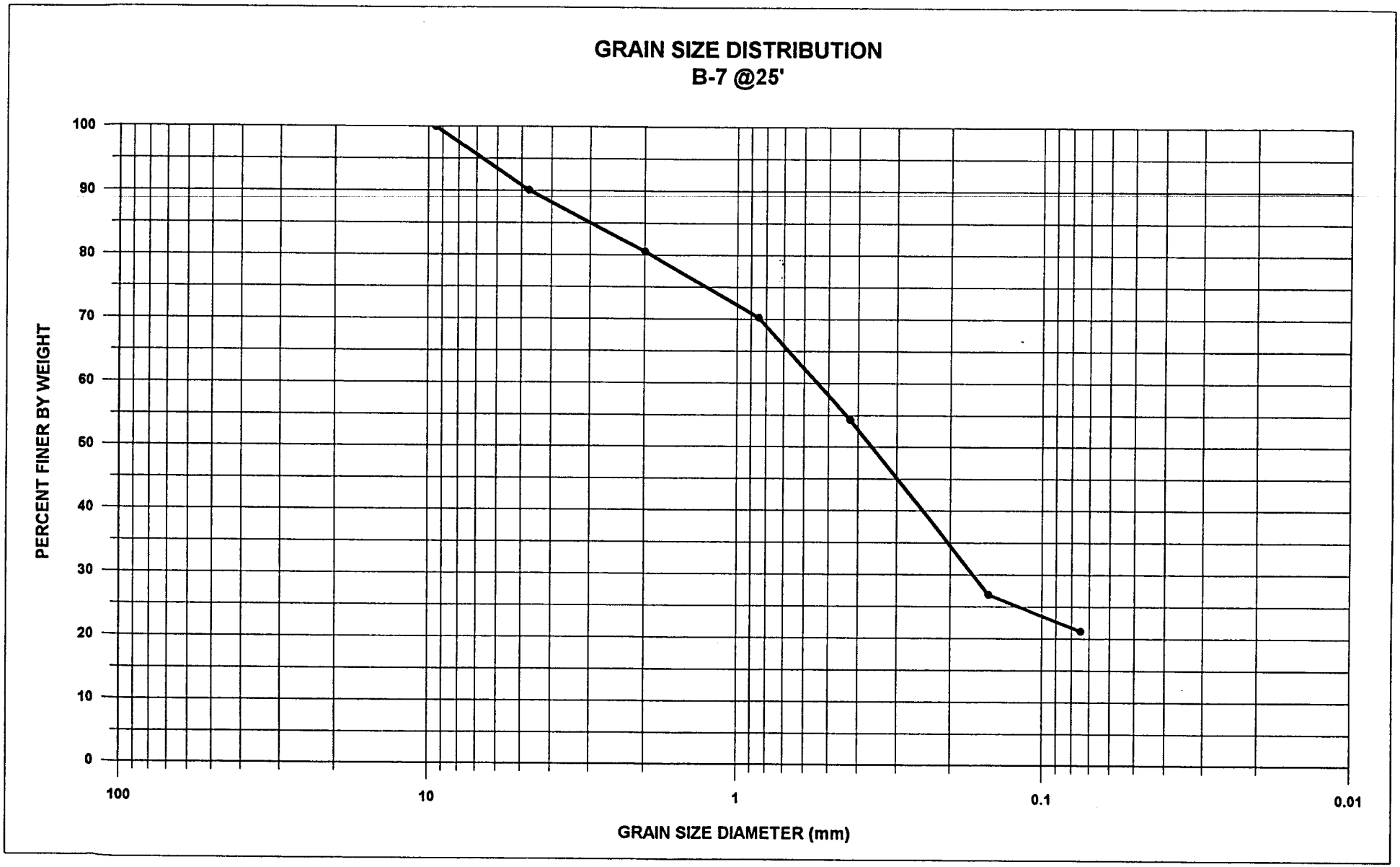
01/26/2000



BAGAHI ENGINEERING INC.

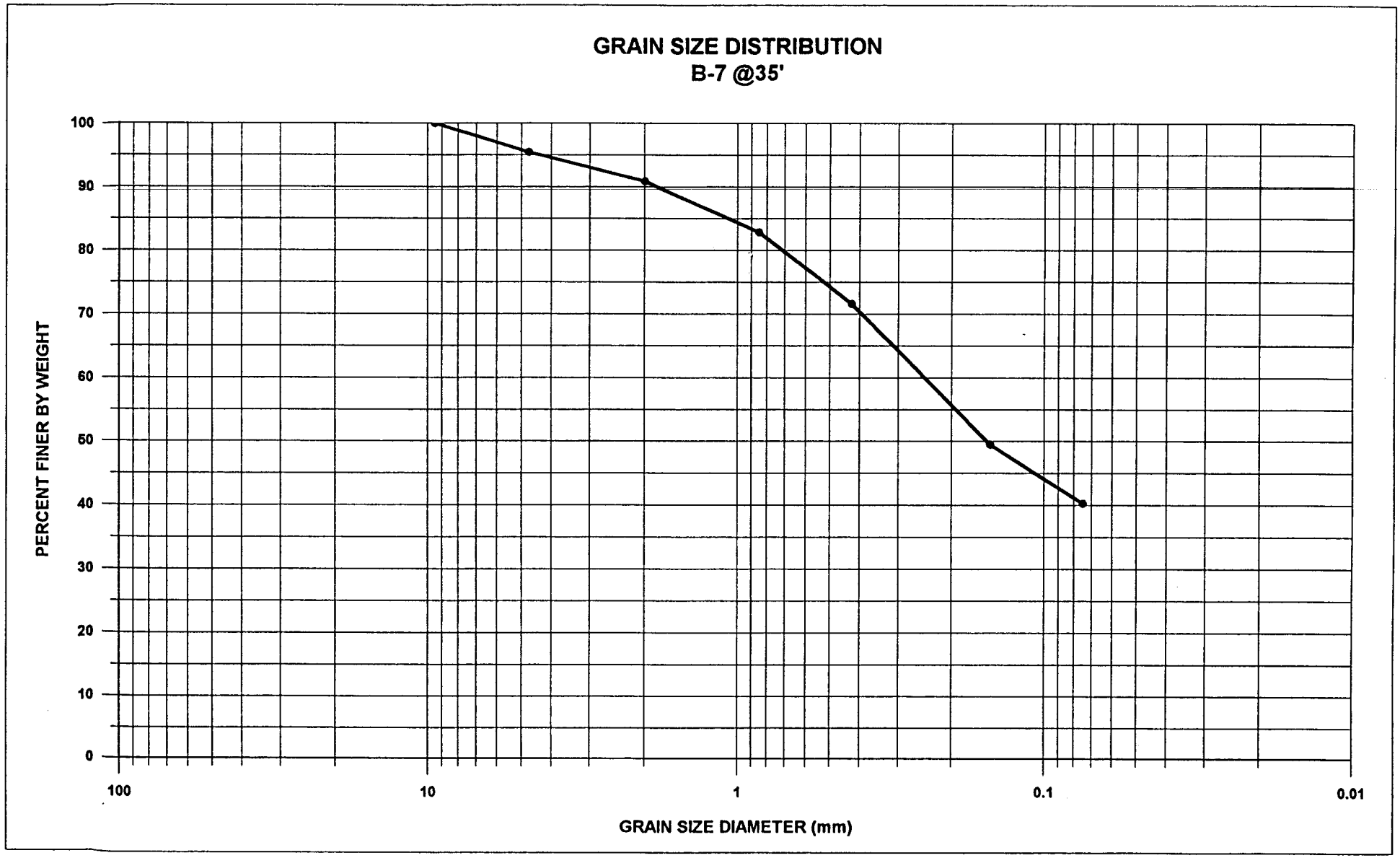
Project: NEPTUNE MARINA

Job No.: 99m-200



BAGAHI ENGINEERING INC.

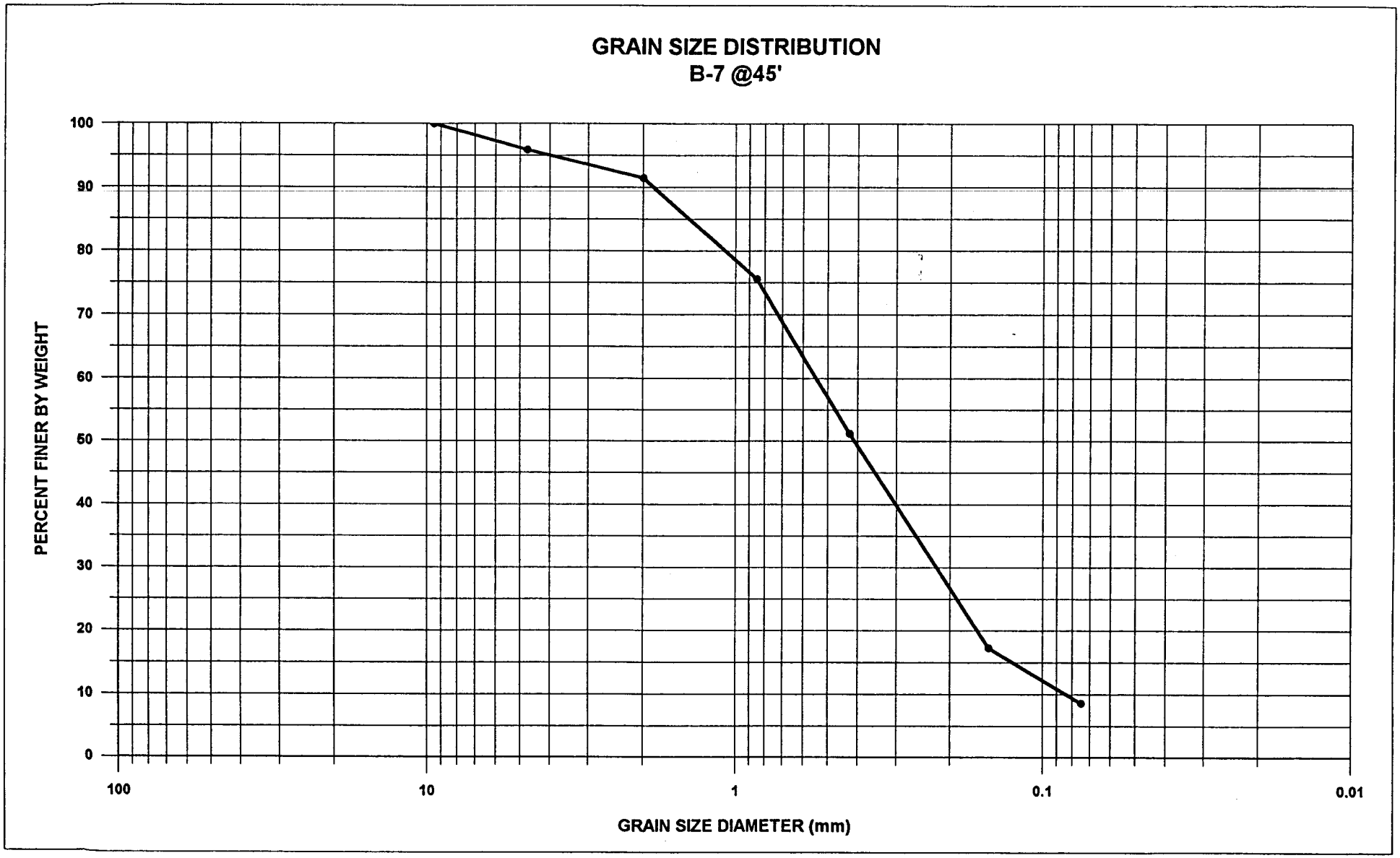
Project: NEPTUNE MARINA Job No.: 99m-200 01/26/2000



BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA

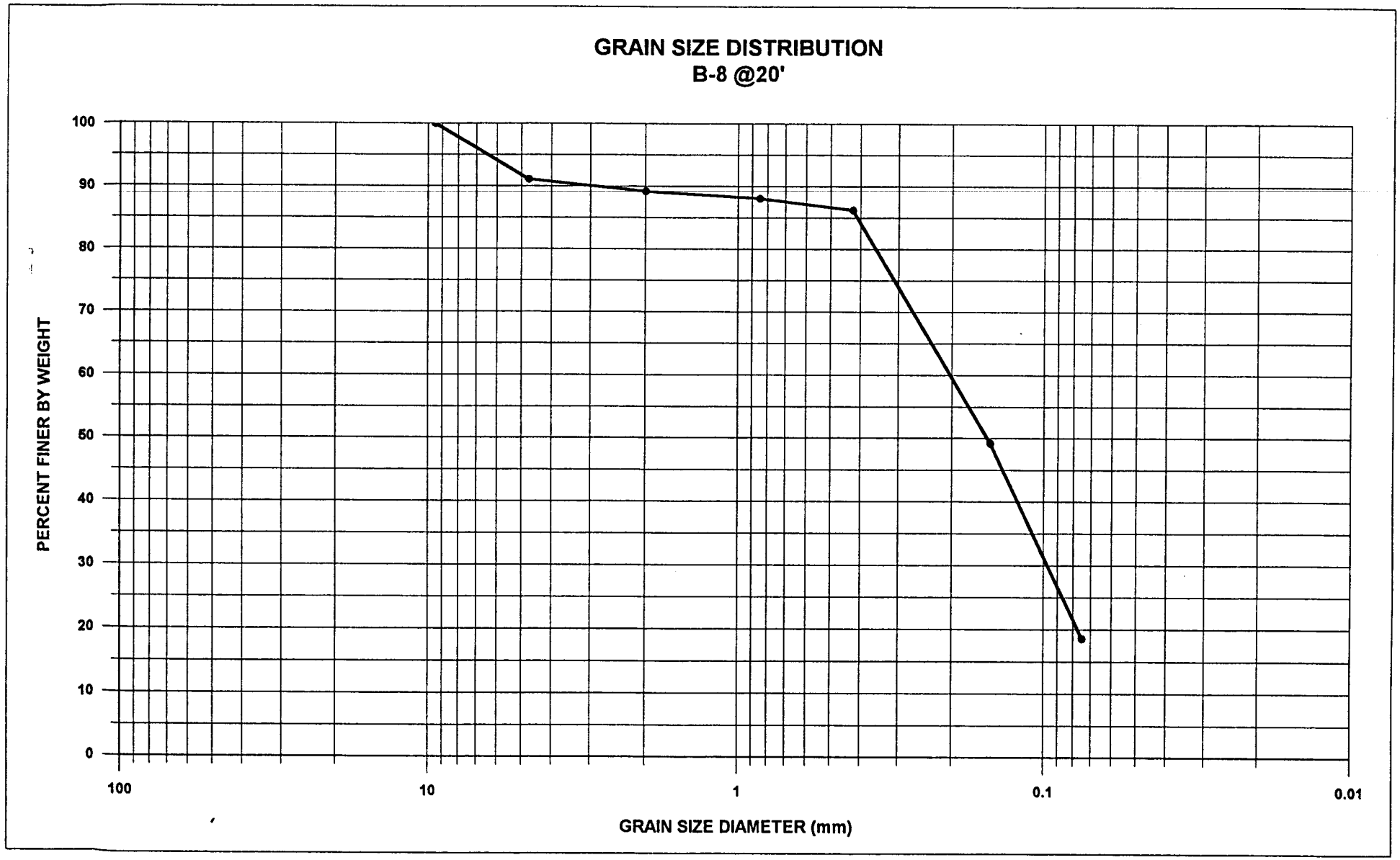
Job No.: 99m-200



BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA

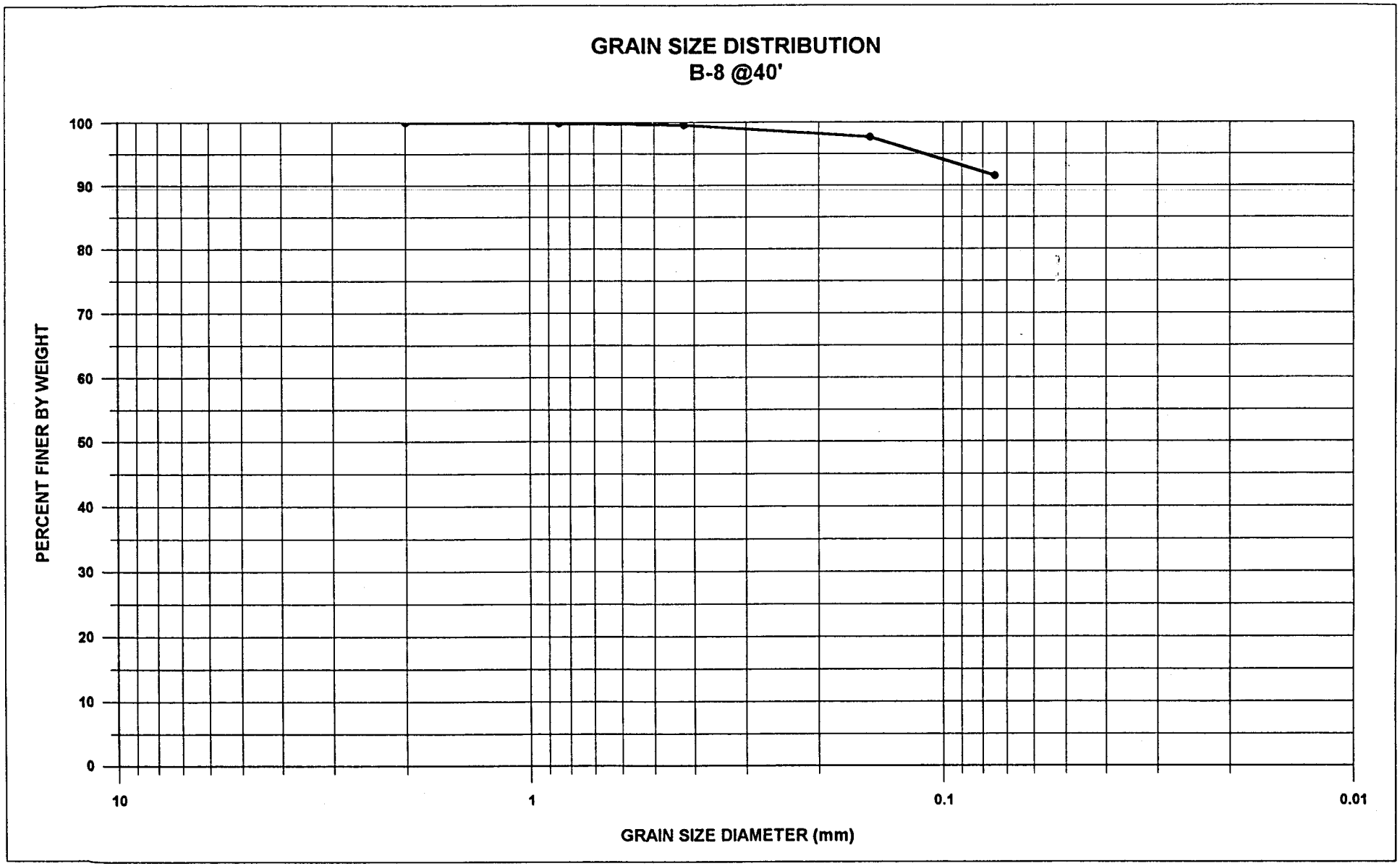
Job No.: 99m-200



BAGAHI ENGINEERING INC.

Project: WOODFINE SUITE HOTEL

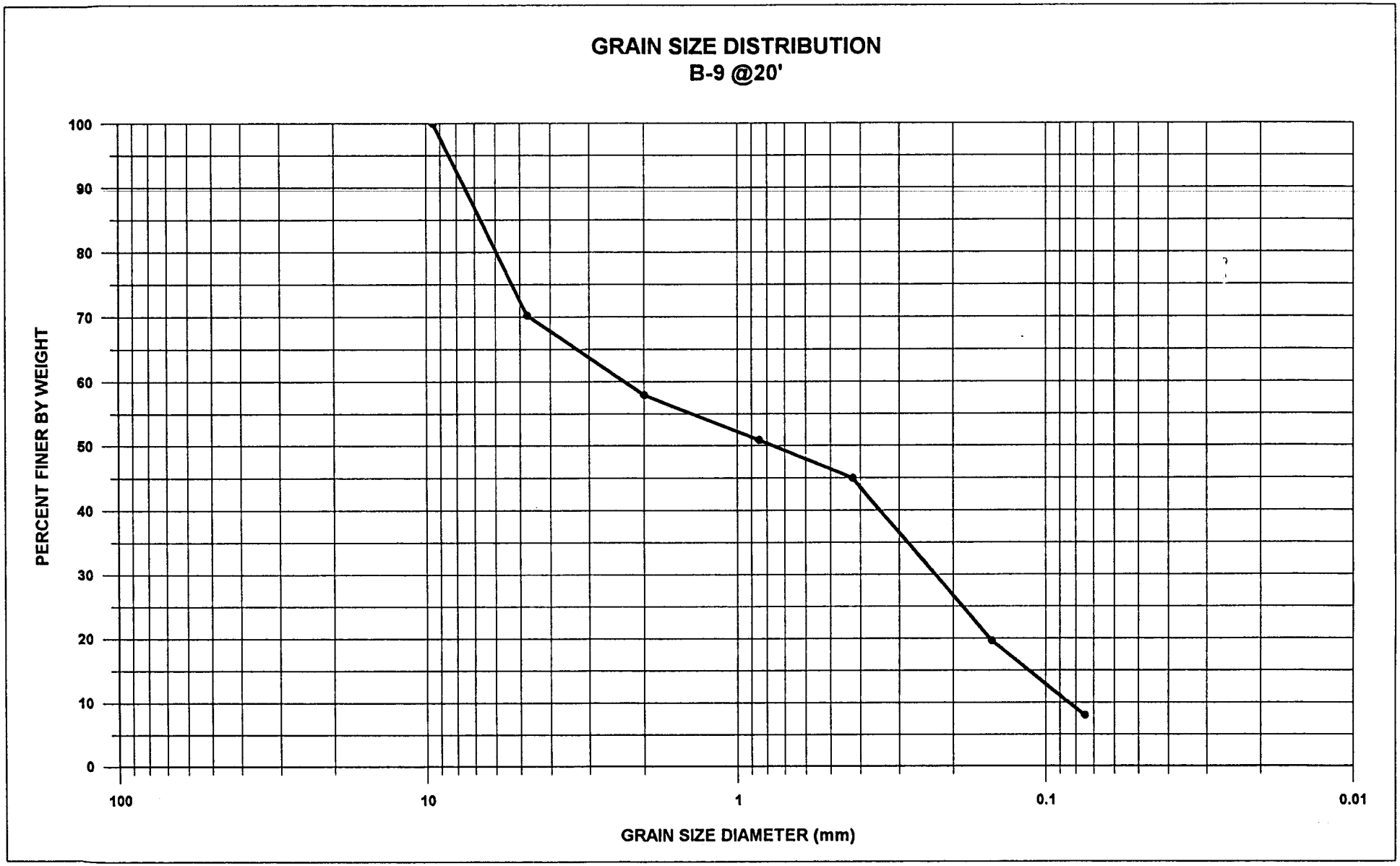
Job No.: 103m-200



BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA

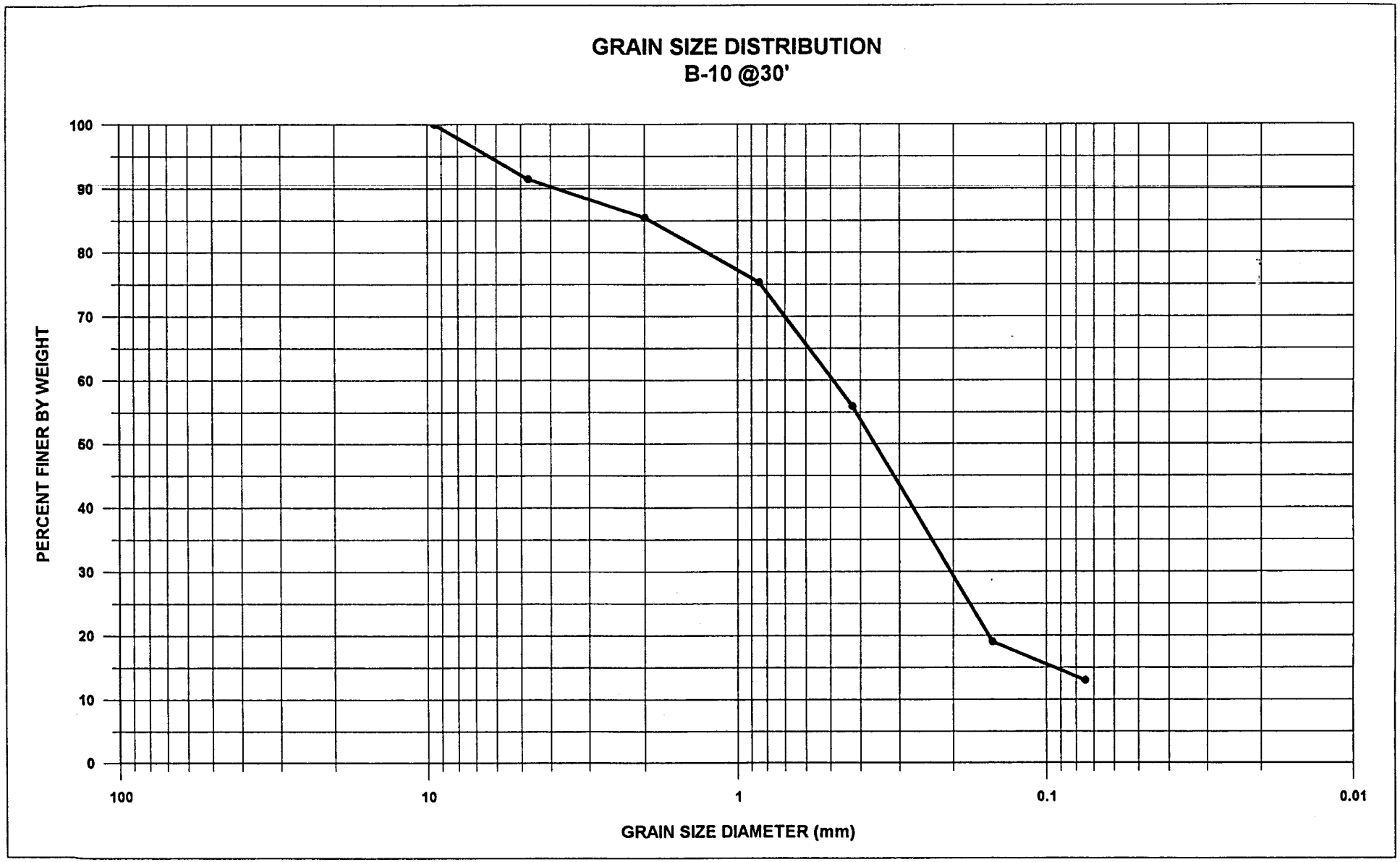
Job No.: 99m-200



BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA

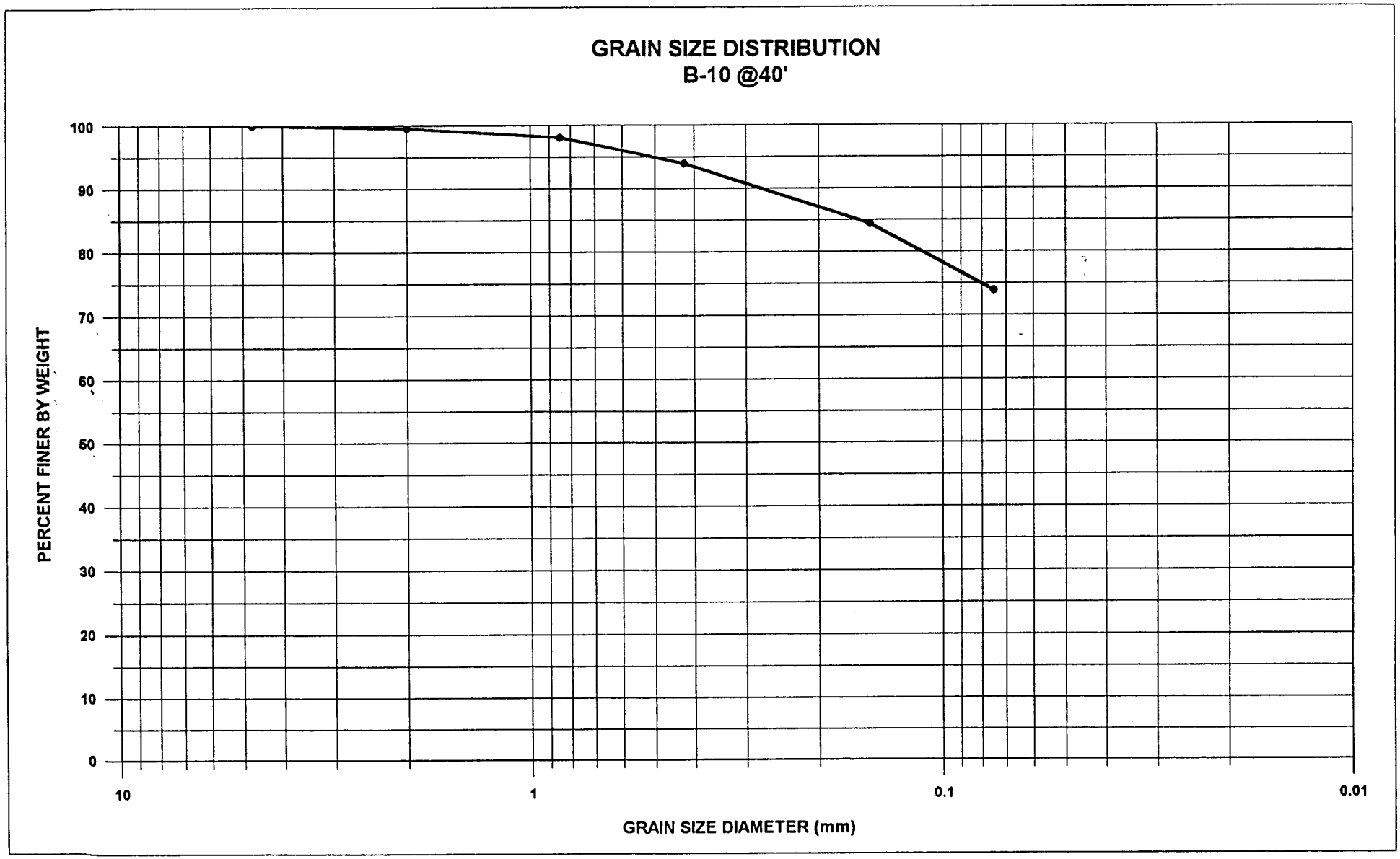
Job No.: 99m-200



BAGAHI ENGINEERING INC.

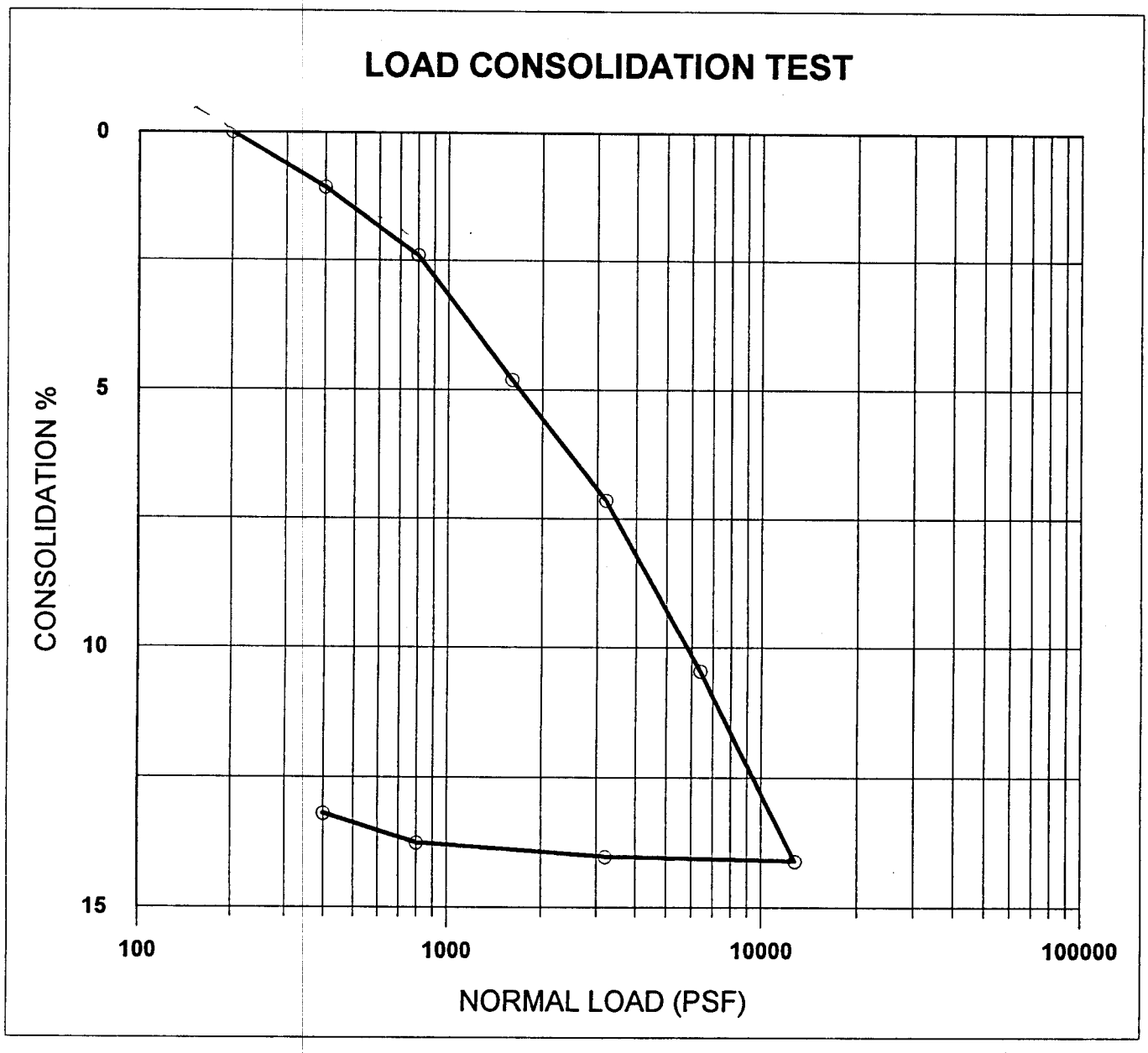
Project: NEPTUNE MARINA

Job No.: 99m-200



BAGAHI ENGINEERING INC.

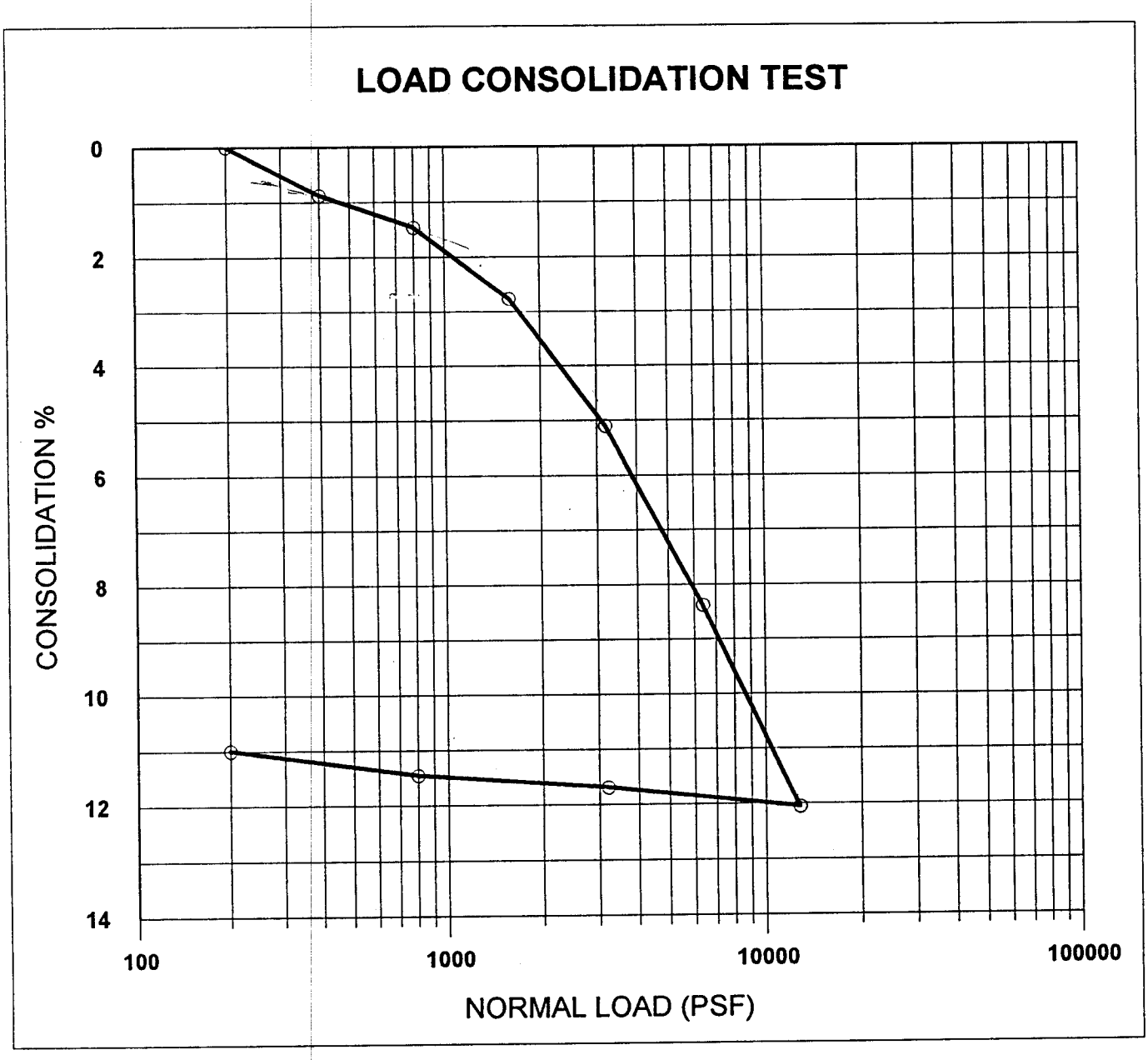
Project: NEPTUNE MARINA Job No. 99m-200-00



BORING NO.:	B-2
DEPTH:	30.0'
SAMPLE SATURATED @:	200

BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA Job No. 99m-200-00



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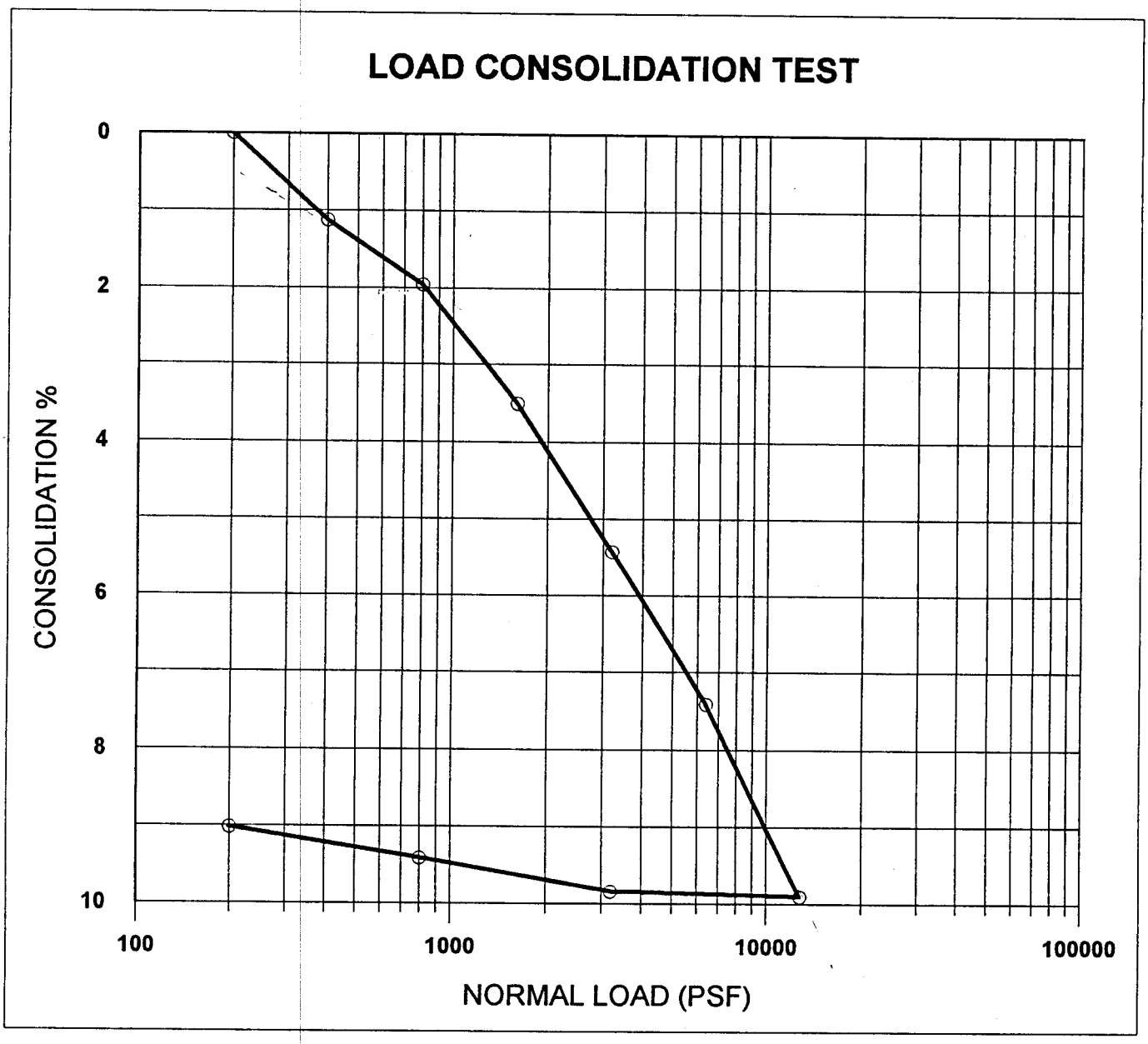
DEPTH:	30.0'
SAMPLE SATURATED @:	200

BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA Job No. 99m-200-00



BORING NO.:	B-6
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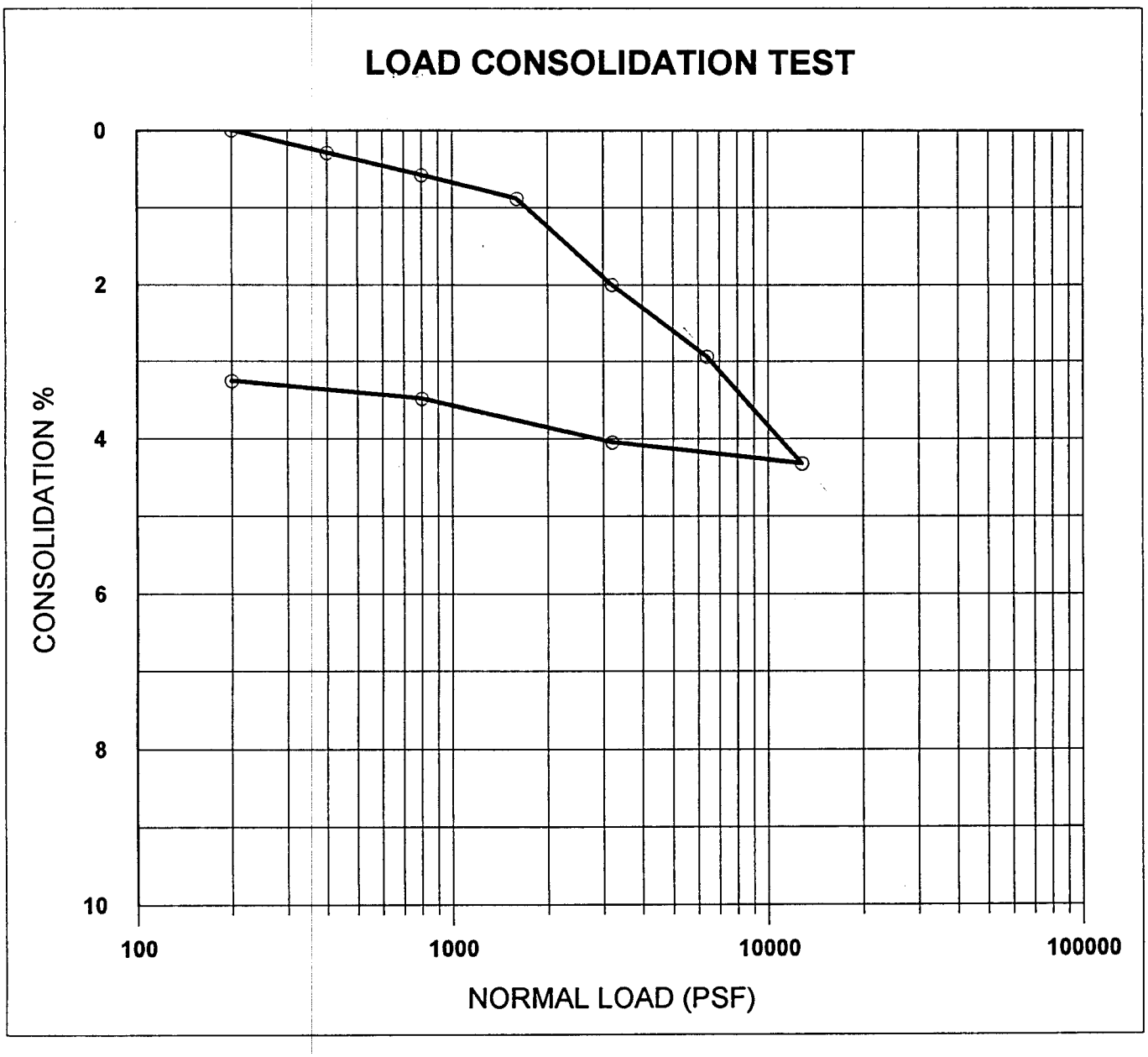
SAMPLE SATURATED @:	200

BAGAHI ENGINEERING INC.

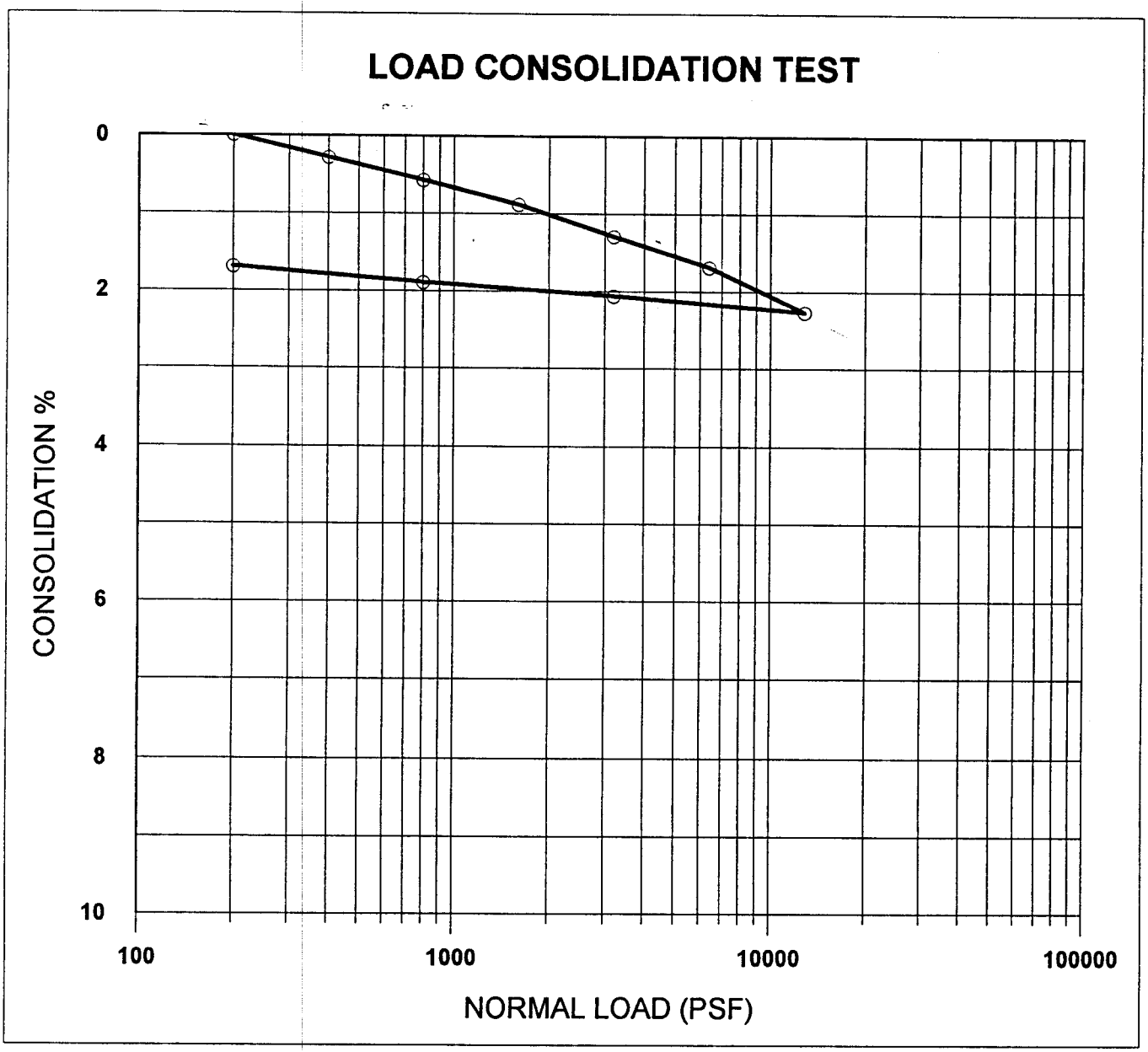
Project: NEPTUNE MARINA Job No. 99m-200-00



BORING NO.:	B-5
DEPTH:	20.0'
SAMPLE SATURATED @:	200

BAGAHI ENGINEERING INC.

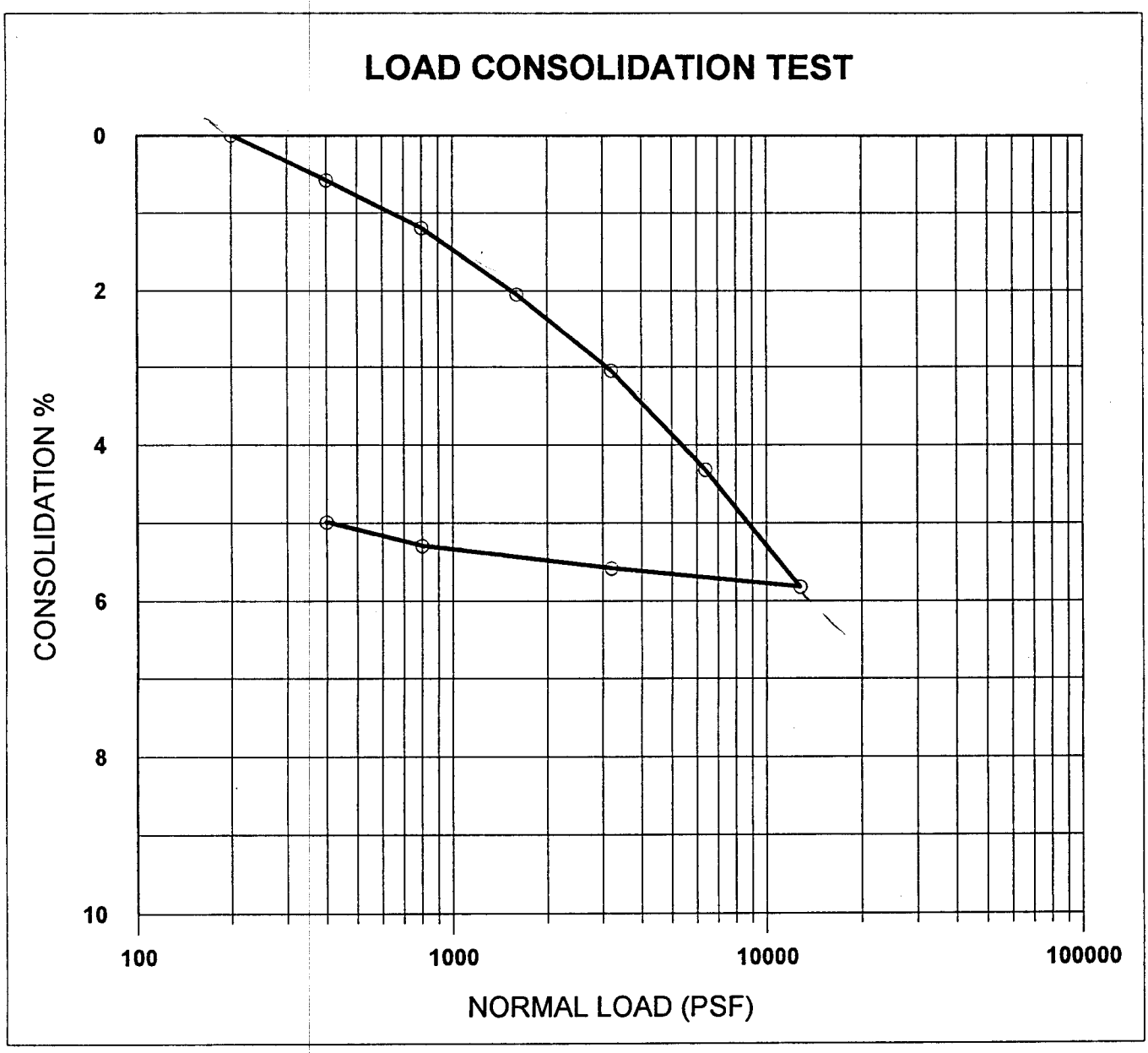
Project: NEPTUNE MARINA Job No. 99m-200-00



BORING NO.:	B-3
DEPTH:	20.0'
SAMPLE SATURATED @:	200

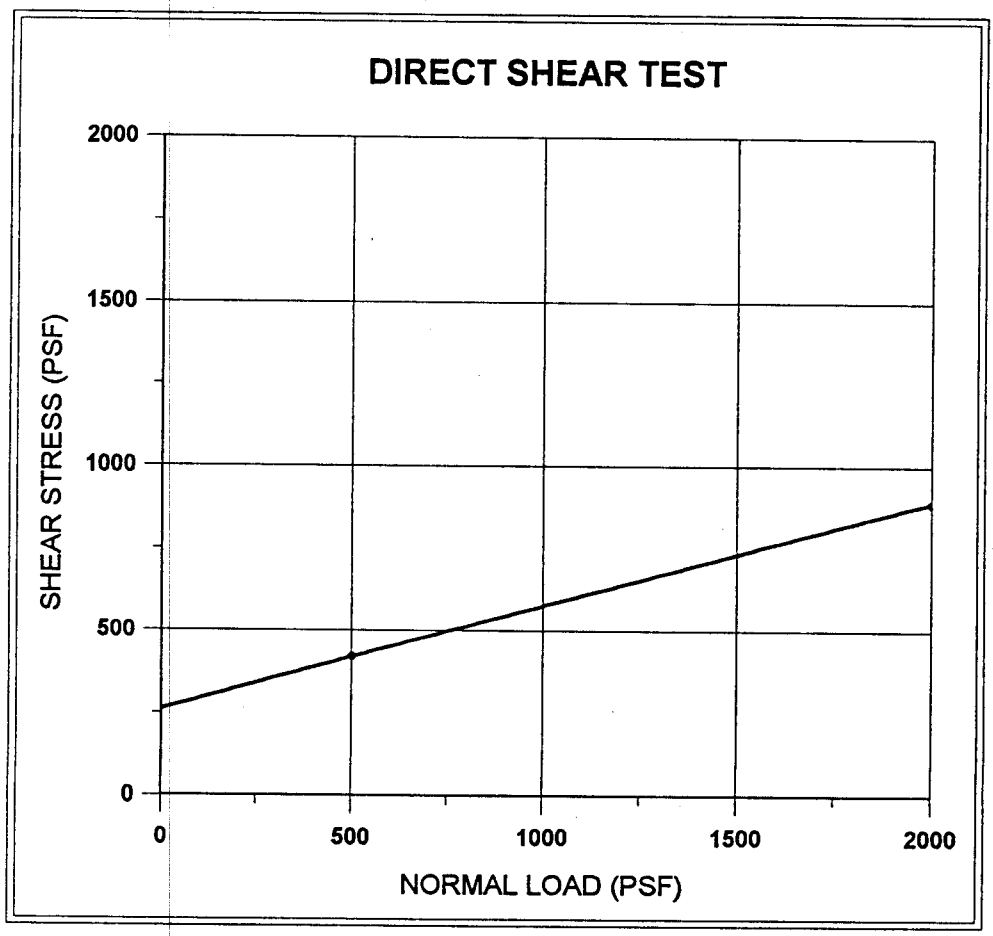
BAGAHI ENGINEERING INC.

Project: NEPTUNE MARINA Job No. 99m-200-00

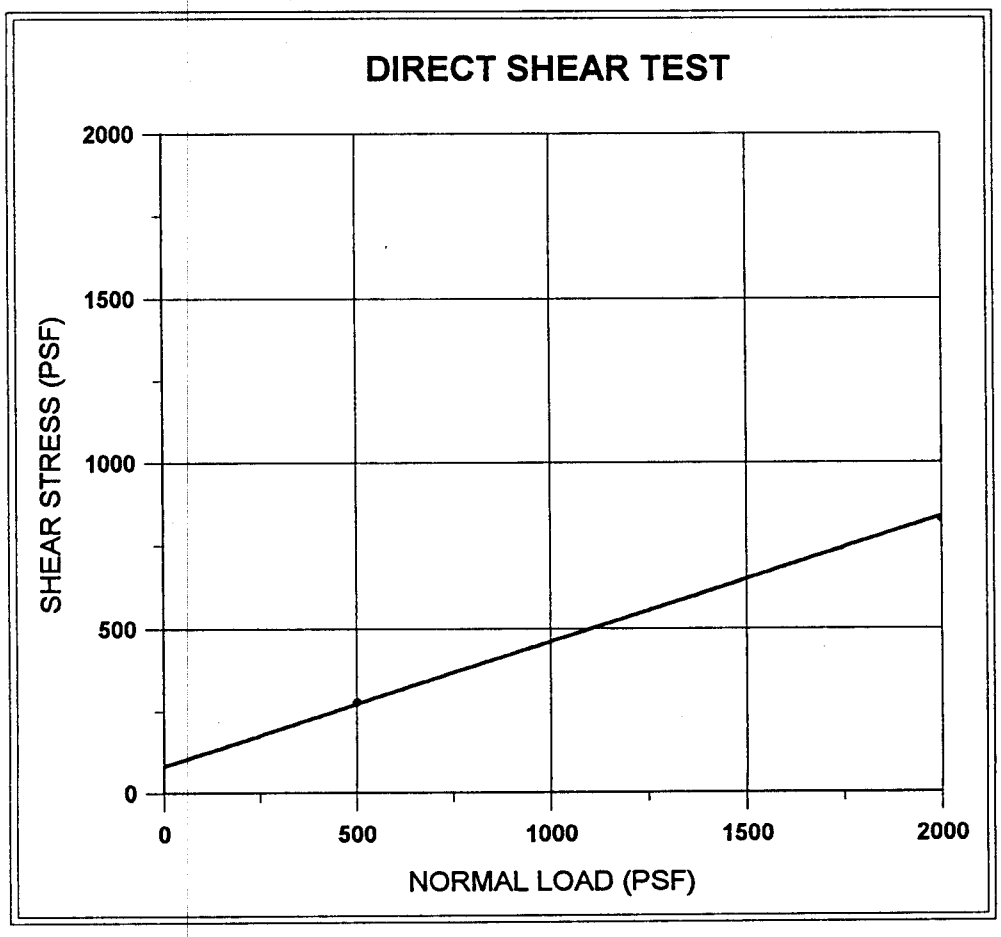


BORING NO.:	B-1
DEPTH:	20.0'
SAMPLE SATURATED @:	200

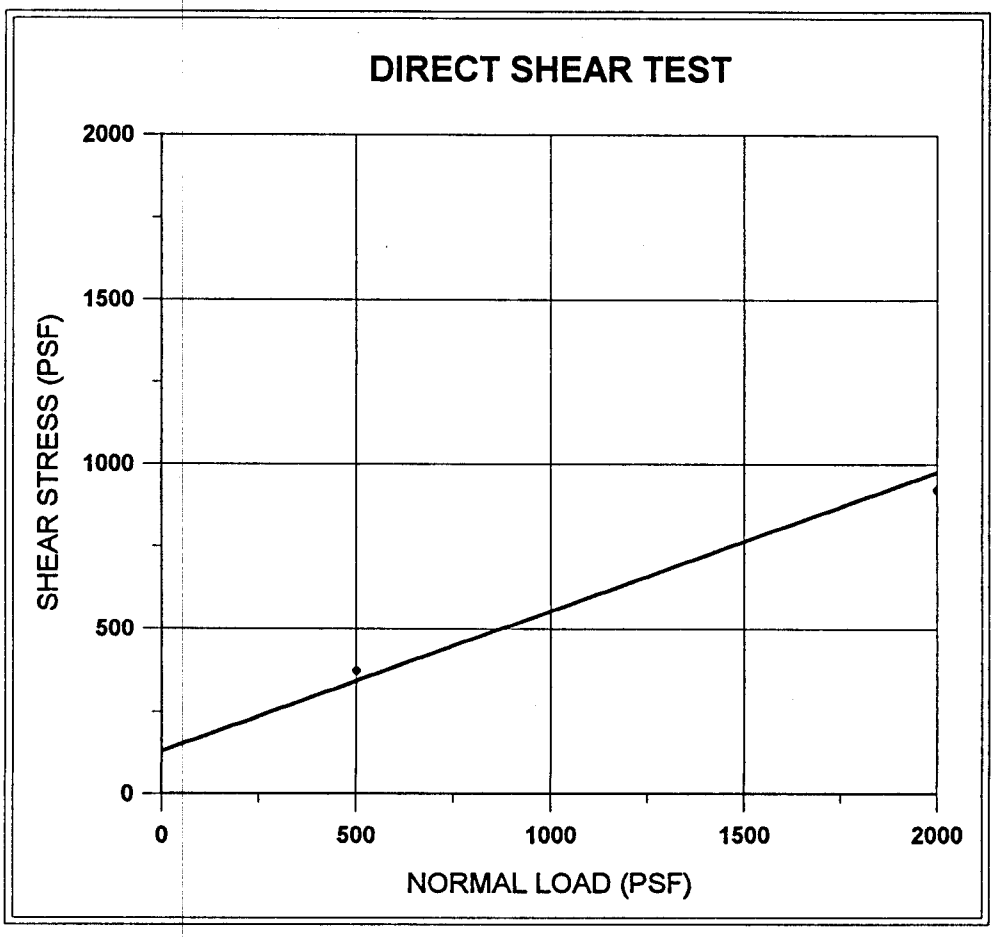
BAGAHI ENGINEERING INC.



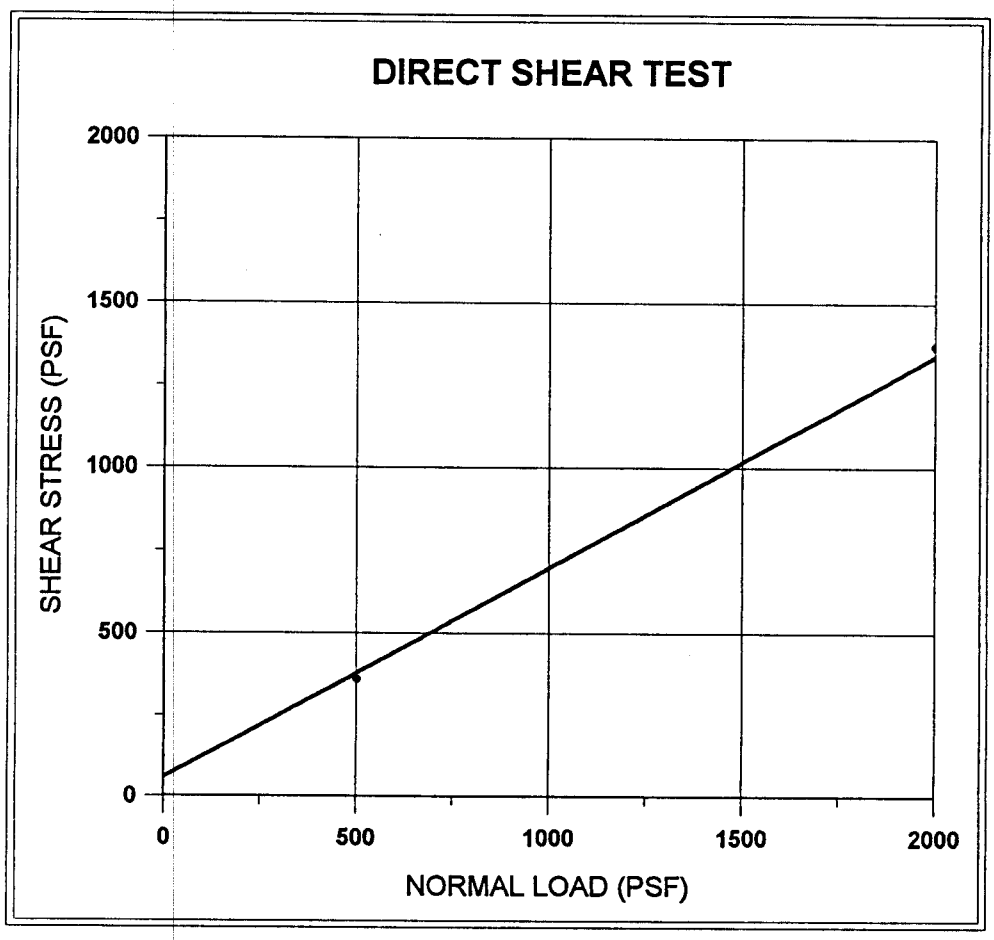
BORING NO.:	B-6
DEPTH (FEET):	30
SAMPLE TYPE:	RING
DESCRIPTION:	silty SAND
COHESION (PSF):	270
FRICTION ANGLE:	15



BORING NO.:	B-4
DEPTH (FEET):	30
SAMPLE TYPE:	SM
DESCRIPTION:	silty SAND
COHESION (PSF):	100
FRICTION ANGLE:	19



BORING NO.:	B-2
DEPTH (FEET):	30
SAMPLE TYPE:	SM
DESCRIPTION:	silty SAND
COHESION (PSF):	150
FRICTION ANGLE:	22



BORING NO.:	B-3
DEPTH (FEET):	20
SAMPLE TYPE:	SM
DESCRIPTION:	silty SAND
COHESION (PSF):	75
FRICTION ANGLE:	29

ANAHEIM TEST LABORATORY

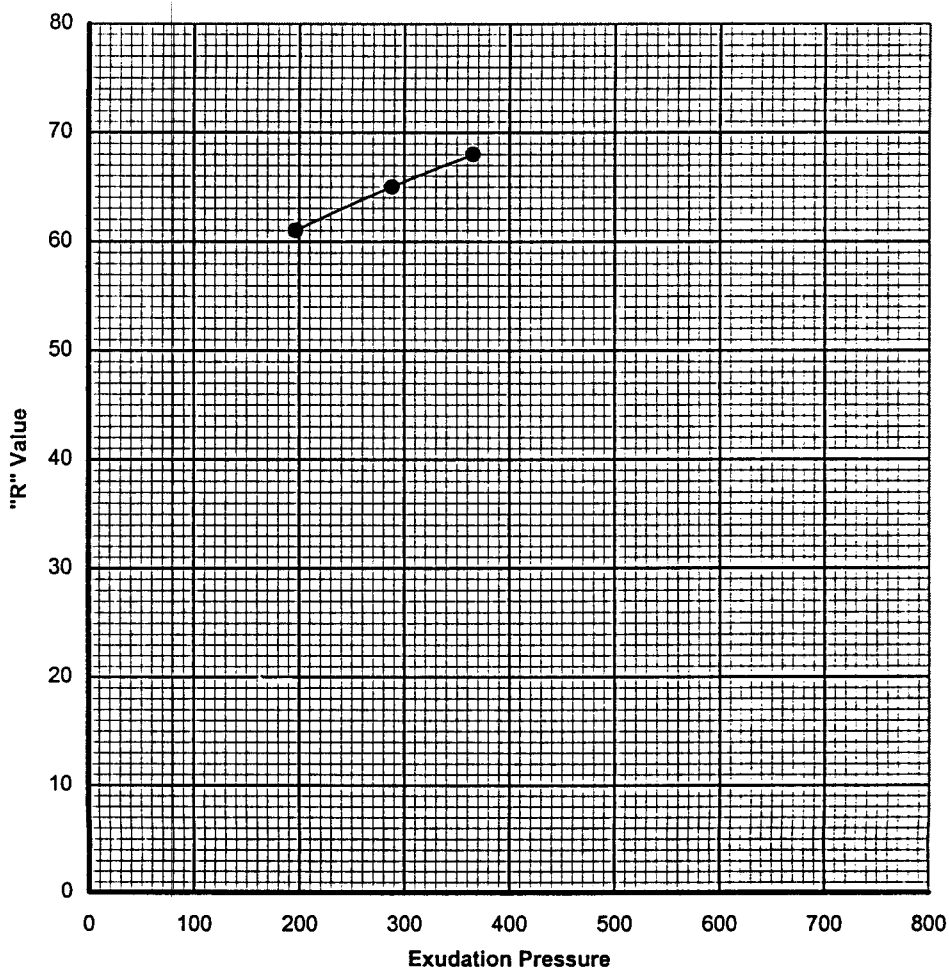
"R" VALUE CA 301

Client: BAGAHI ENGINEERING: **Job No.:** B 6131 **Date:** 03/13/2000

Client Reference No.: #99M-200 **Soil Type:** D.Brown, F. Silty Sand w. marine frgmts

TEST SPECIMEN		A	B	C	D
Compactor Air Pressure	psi	350	350	3540	
Initial Moisture Content	%	4.8	4.8	4.8	
Moisture at Compaction	%	11.8	12.2	12.7	
Briquette Height	in.	2.58	2.57	2.59	
Dry Density	pcf	113.7	113.4	113.6	
EXUDATION PRESSURE	psi	365	288	197	
EXPANSION dial	(x .0001)	5	0	0	
Ph at 1000 pounds	psi	19	21	22	
Ph at 2000 pounds	psi	35	39	41	
Displacement	turns	4.47	4.4	4.75	
"R" Value		67	64	60	
CORRECTED "R" VALUE		68	65	61	

Final "R" Value	
BY EXUDATION: @ 300 psi	**65**
BY EXPANSION: TI = 5	**N/A**



ANAHEIM TEST LABORATORY

3008 S. ORANGE AVENUE
SANTA ANA, CALIFORNIA 92707
PHONE (714) 549-7267

TO: BAGAHI ENGINEERING.
3901 WESTERLY PLACE #109
NEWPORT BEACH,CA. 92701

ATTN. KEN BAGAHI

PROJECT# 99M-200

DATE: 3-14-2000

P.O. No. Verbal

Shipper No.

Lab. No. B 6131

Specification:

Material: Soil

B 11 @ 0-2'

NEPTUNE MARINA

"R" VALUE TEST

BY EXUDATION	65
BY EXPANSION	N/A

RESPECTFULLY SUBMITTED

POPPY BRIDGER Chief Chemist

FORM #2

M. J. Schiff & Associates, Inc.
Consulting Corrosion Engineers - Since 1959
1308 Monte Vista Avenue, Suite 6
Upland, CA 91786-8224
Phone: 909/931-1360

Table 1 - Laboratory Tests on Soil Samples

Neptune Marina, Marina Del Rey, CA
MJS&A #00-0079HQ
14-Feb-00

Sample ID			B-2/Neptune @ 10' 99N-200	B-5/W.F. Hotel @ 25-27' 103M-200	B-6/Neptune @ 5-10' 99N-200	B-8/Neptune @ 35'
Resistivity		**Units**				
as-received		ohm-cm	480	64	470	210
saturated		ohm-cm	430	64	430	190
pH			7.8	7.4	7.8	8.4
Electrical Conductivity		mS/cm	2.07	9.76	0.85	1.60
Chemical Analyses						
Cations						
calcium	Ca^{2+}	mg/kg	649	950	301	28
magnesium	Mg^{2+}	mg/kg	258	960	46	24
sodium	Na^{1+}	mg/kg	1,252	8,596	456	1,544
Anions						
carbonate	CO_3^{2-}	mg/kg	ND	ND	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	876	491	488	131
chloride	Cl^{1-}	mg/kg	277	15,683	252	2,120
sulfate	SO_4^{2-}	mg/kg	4,126	2,394	1,130	413
Other Tests						
ammonium	NH_4^{1+}	mg/kg	25.3	31.0	8.9	4.2
nitrate	NO_3^{1-}	mg/kg	2.0	2.2	1.8	1.3
sulfide	S^{2-}	qual	POS	POS	NEG	POS
Redox		mv	-74	-41	na	-31

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

APPENDIX G3
PREVIOUS SUBSURFACE EXPLORATION DATA BY LEIGHTON AND ASSOCIATES

GEOTECHNICAL BORING LOG LA-1

Date 6-30-99 | Sheet 1 of 2
Project Legacy - Neptune | Project No. 990127-001
Drilling Co. A & W Drilling | Type of Rig Rotary Wash
Hole Diameter 5" | Drive Weight 140 Lbs | Drop 30i
Elevation Top of Hole | Ref. or Datum

Logged By SSM
Sampled By DEJ/SSM

Elevation Feet	Depth Feet	Graphic Log	Comments	Tube Sample No.	Blows Per Foot/N-Value	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	0			B-1					AC over base (6")
				S-1	8			SP	SAND: Dark brown, moist, loose, medium grained
	5			D-1	6	95.6	10.4	SP	SAND: Dark brown, slightly moist, loose, medium grained
	10			S-2	4			SP	SAND: Olive brown, moist, loose, medium to fine grained
	15			D-2	13	109.4	16.6	GP/SP	SANDY GRAVEL TO GRAVELLY SAND: Olive to olive brown, moist, medium dense to loose, medium grained with 1/4 " gravel
	20			S-3	21			SP	SAND: Olive grey, moist to wet, medium dense, medium grained
	25			D-3	2			SP	No Recovery Cuttings obtained in Bag
				B-2					
	30								

LEIGHTON & ASSOCIATES

GEOTECHNICAL BORING LOG LA-1

Date 6-30-99 | Sheet 2 of 2
Project Legacy - Neptune | Project No. 990127-001
Drilling Co. A & W Drilling | Type of Rig Rotary Wash
Hole Diameter 5" | Drive Weight 140 Lbs | Drop 30
Elevation Top of Hole | Ref. or Datum

Logged By SSM
Sampled By DEJ/SSM

Elevation Feet	Depth Feet	Graphic Log	Comments	Tube Sample No.	Blows Per Foot/N-Value	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	30			S-4	2			SC/CL	SANDY CLAY TO CLAYEY SAND: Olive grey, moist to wet, loose to soft, medium to fine grained
	35			D-4	6	109.9	19.1	CL-ML	CLAYEY SILT WITH FINE SAND: Olive grey, moist to wet, loose to soft
	40			S-5	15			ML	SANDY SILT WITH CLAY: Dark greyish brown, moist, moderately loose
									GRAVEL
	45			D-5	42	124.2	11.5	SP	SAND WITH SOME GRAVEL: Grey, wet, dense, coarse grained, gravel is 1/8 " pea shaped, rounded to subrounded
	50			S-6	57			SP	GRAVELLY SAND: Grey, wet, dense, coarse grained
	55			D-6	60	125.9	11.6	SP	GRAVELLY SAND: Grey, wet, dense
	60								

NOTES
Drilling terminated at 56.5 feet
Groundwater at 9 feet
Boring backfilled with cuttings and patched with AC

GEOTECHNICAL BORING LOG LA-2

Date 6-30-99 | Sheet 1 of 1
Project Legacy - Neptune | Project No. 990127-001
Drilling Co. A & W Drilling | Type of Rig Rotary Wash
Hole Diameter 5" | Drive Weight 140 Lbs | Drop 30
Elevation Top of Hole | Ref. or Datum

Logged By SSM
Sampled By DEJ/SSM

Elevation Feet	Depth Feet	Graphic Log	Comments	Tube Sample No.	Blows Per Foot/N-Value	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	0								AC Paving
									FILL
				S-1	4			SP	
	5			D-1	2	99.7	16.8	SP	SAND: Greyish brown, moist, loose, medium grained with clay layers, also with crushed shell fragments
	10			S-2	3			SP	SAND: Greyish brown, moist to slightly moist, loose, medium grained sand with interspersed layers/seams of clay
	15			D-2	4	104.6	18.6	SP	SAND: Grey, moist, loose, medium to coarse, with shell fragments
									@ 17' Drill chatter, gravel/rock
									@ 18': Hard drilling, slow
									Refusal @ 18.5'
	20								
	25								
	30								

NOTES
Drilling terminated at 18.5 feet
Groundwater encountered at 11 feet
Boring backfilled with cuttings and patched with AC

LEIGHTON & ASSOCIATES

GEOTECHNICAL BORING LOG LA-2A

Date 6-30-99 | Sheet 1 of 2
Project Legacy - Neptune | Project No. 990127-001
Drilling Co. A & W Drilling | Type of Rig Rotary Wash
Hole Diameter 5" | Drive Weight 140 Lbs | Drop 30i
Elevation Top of Hole | Ref. or Datum

Logged By SSM
Sampled By DEJ/SSM

Elevation Feet	Depth Feet	Graphic Log	Comments	Tube Sample No.	Blows Per Foot/N-Value	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	0								AC Paving
									FILL
	5			S-1	2			SP-SC	SAND WITH CLAY: Dark grey, moist, moderately loose, contains abundant shells
	10			D-1	1	87.6	32.8	SP-SM	SAND WITH SILT AND CLAY: Grey, moist, moderately loose, less shell constituents, fine grained
	15			S-2	10			SP-SM	SAND WITH SILT AND CLAY: Same as above
	20			D-2	33	98.6	23.2	SP	SAND: Olive green grey, moist, fine grained
	25			S-3	1			CL	CLAY WITH SILT: Olive green grey, moist, very soft
	30								

GEOTECHNICAL BORING LOG LA-2A

Date 6-30-99 | Sheet 2 of 2
Project Legacy - Neptune | Project No. 990127-001
Drilling Co. A & W Drilling | Type of Rig Rotary Wash
Hole Diameter 5" | Drive Weight 140 Lbs | Drop 30 in
Elevation Top of Hole | Ref. or Datum

Logged By SSM
Sampled By DEJ/SSM

Elevation Feet	Depth Feet	Graphic Log	Comments	Tube Sample No.	Blows Per Foot/N-Value	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	30			D-3	4	108.1	20.0	SC/CL	CLAYEY SAND TO SANDY CLAY: Dark greenish grey to olive green, moist, soft
	35			S-4	9			SC/CL	CLAYEY SAND TO SANDY CLAY: Dark olive green, moist, medium stiff
	40			D-4	8	119.3	15.3	CL	SANDY CLAY WITH SILT: Greyish dark brown, slightly moist, soft
									@ 42' : Gravel - Hard drilling
	45			S-5	65				FRAGMENTED ROCKS: Dark olive/green grey, moist, granite observed
	50			D-5	100	128.9	11.1	GP/SP	GRAVELLY SAND TO SANDY GRAVEL: Dark olive/green grey, wet
	55								NOTES. Drilling terminated at 51.5 feet. Groundwater encountered at 9.5 feet. Boring backfilled with cuttings and patched with AC
	60								

LEIGHTON & ASSOCIATES

GEOTECHNICAL BORING LOG LA-3

Date 6-30-99 | Sheet 1 of 2
Project Legacy - Neptune | Project No. 990127-001
Drilling Co. A & W Drilling | Type of Rig Rotary Wash
Hole Diameter 5" | Drive Weight 140 Lbs | Drop 30in
Elevation Top of Hole | Ref. or Datum

Logged By SSM
Sampled By DEJ/SSM

Elevation Feet	Depth Feet	Graphic Log	Comments	Tube Sample No.	Blows Per Foot/N-Value	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	0								AC Paving
				D-1	13	93.3	27.5	SP	Poor Recovery SAND: Greyish, moist, loose to very loose, fine grained
	5			S-1	11			SM	SILTY SAND: Greyish, moist, loose, medium to fine grained
	10			D-2	3	90.6	31.9	ML/SM	SANDY SILT TO SILTY FINE SAND WITH TRACE OF CLAY: Olive grey, moist, loose to very loose, fine grained
	15			S-2	4			SP/SM	SAND: Olive grey, moist to wet, loose to very loose, fine grained with some silt
	20			D-3	13	91.5	29.3	SP	SAND: Olive grey, moist to wet, fine grained and minor amount of silt
	25			S-3				CL	No Recovery Pushed a shelby tube (Clay)
	30								

LEIGHTON & ASSOCIATES

GEOTECHNICAL BORING LOG LA-3

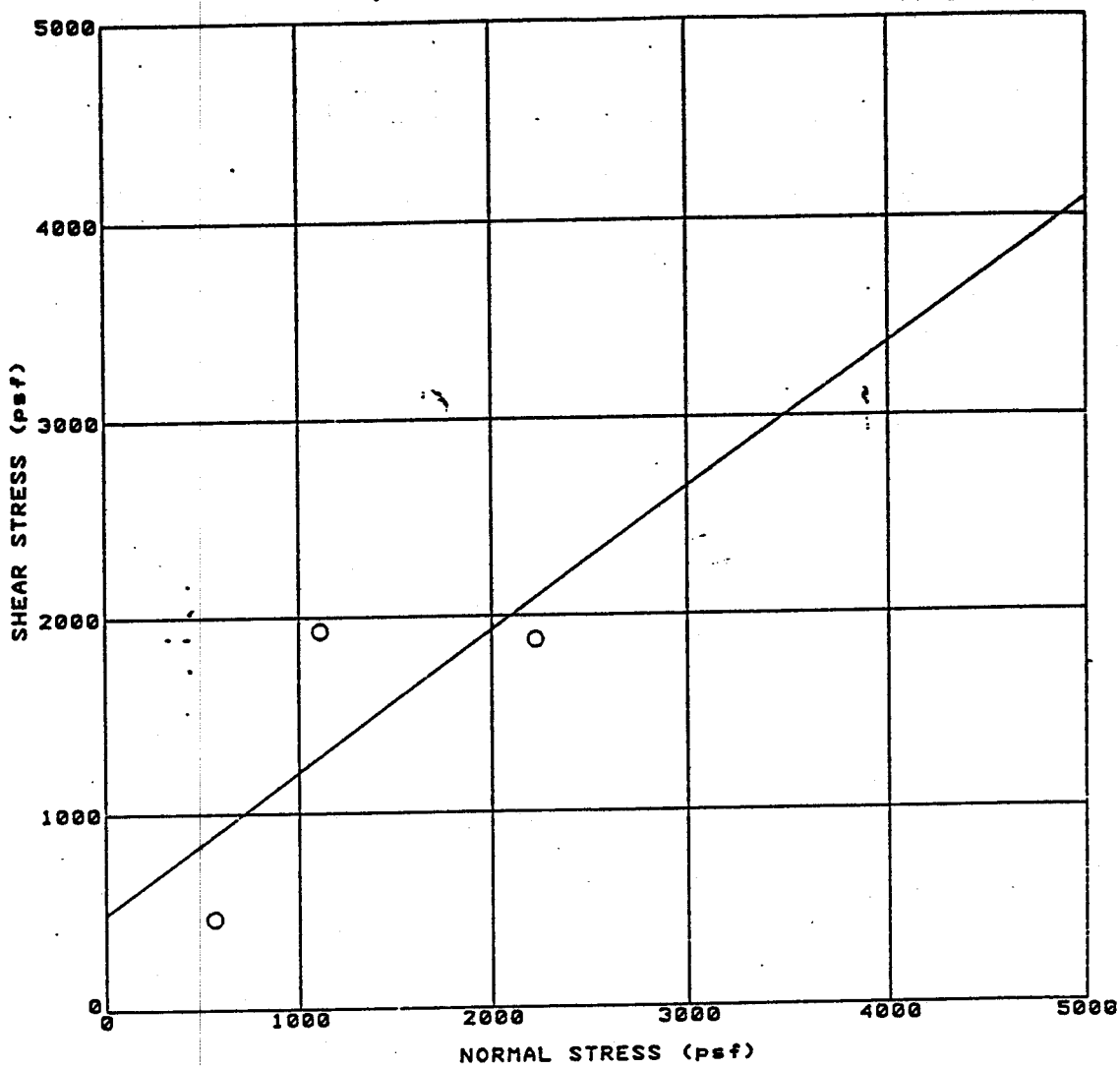
Date 6-30-99 | Sheet 2 of 2
Project Legacy - Neptune | Project No. 990127-001
Drilling Co. A & W Drilling | Type of Rig Rotary Wash
Hole Diameter 5" | Drive Weight 140 Lbs | Drop 30
Elevation Top of Hole | Ref. or Datum

Logged By SSM
Sampled By DEJ/SSM

Elevation Feet	Depth Feet	Graphic Log	Comments	Tube Sample No.	Blows Per Foot/N-Value	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	30			D-4	13	111.9	16.5	SP	SAND: Dark olive green, moist, loose to medium dense, coarse to medium grained (some clay at the top of the sample)
				B-1					@32': GRAVEL: 0.25-inch to 0.5-inch, rounded to sub-rounded, multi colored
	35			S-4	58			SP	GRAVELLY SAND: Greyish with multi colored gravel, moist, dense to very dense, coarse to medium grained
	40			D-4	65	128.8	10.7	SP	GRAVELLY SAND: Greyish brown with multi colored gravel, moist, dense to very dense, coarse to medium grained
	45			S-5	23				Same as above, underlain by clayey silt, poor recovery
									@ 47.5': Drill Chatter
	50			D-5	62	97.7	27.2	ML/SM	SANDY SILT TO SILTY SAND: Olive, moist, dense, fine grained
	55								NOTES Drilling terminated at 51.5' Groundwater at 4' Boring backfilled with cuttings and patched with AC
	60								

LEIGHTON & ASSOCIATES

APPENDIX G4
PREVIOUS LABORATORY TESTING DATA BY LEIGHTON AND ASSOCIATES



Boring No.	LA-1	After Test (Average Values):	
Sample No.	D-2	Dry Density (pcf)	101.9
Depth (ft)	15	Moisture Content (%):	24.0
Soil Type			
Remarks	Gravelly Sand (1st-Run Peak)		
	Friction Angle (deg.)	36	
	Cohesion (psf)	490	

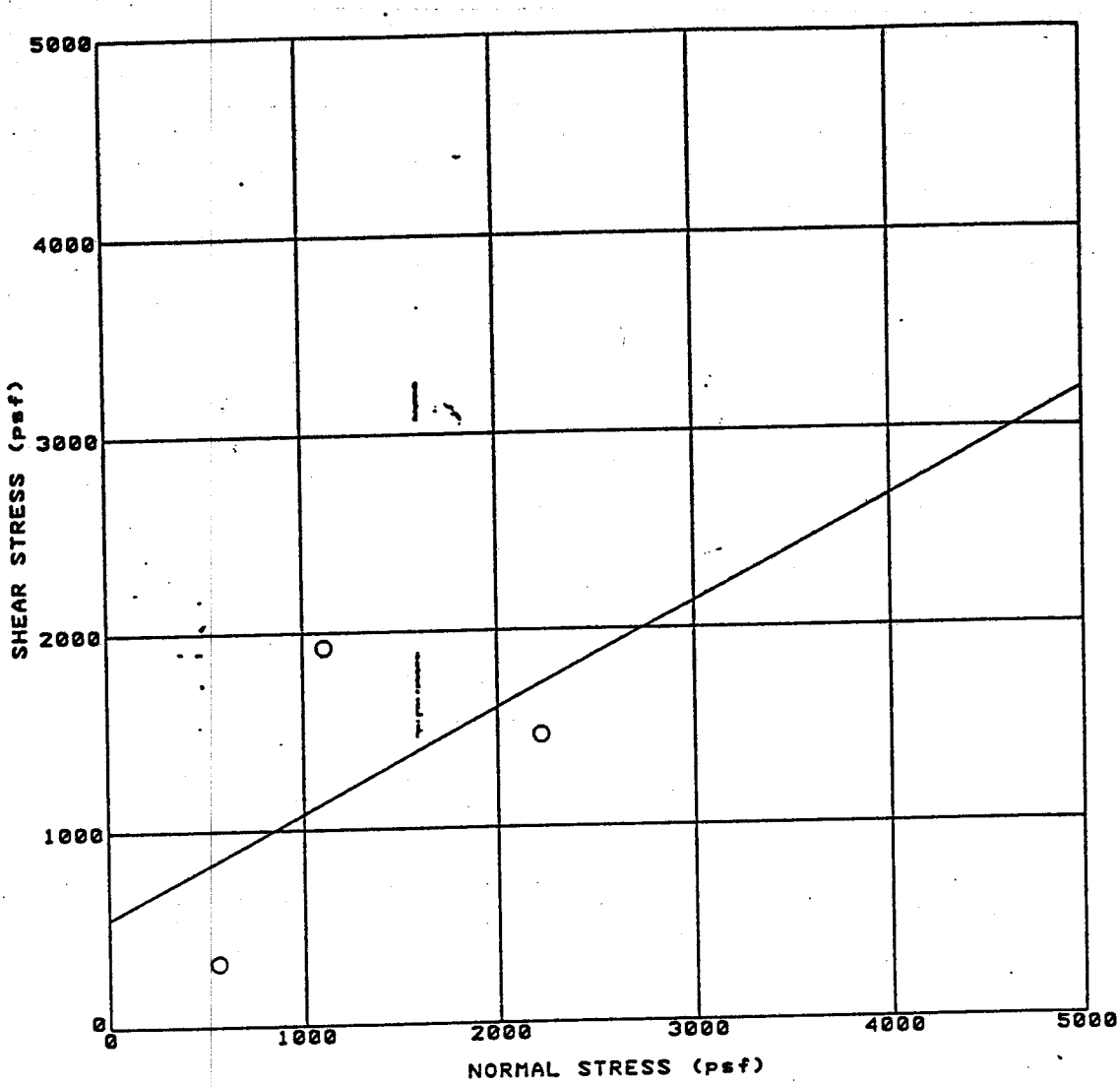
DIRECT SHEAR

Project No. 990127-001

Project Name Legacy - Neptune

Date

Figure No. C - 1.1



Boring No.	LA-1	After Test (Average Values):	
Sample No.	D-2	Dry Density (pcf)	101.9
Depth (ft)	15	Moisture Content (%):	24.0
Soil Type			
Remarks	Gravelly Sand (1st-Run Residual (Ultimate))		
	Friction Angle (deg.)	28	
	Cohesion (psf)	552	

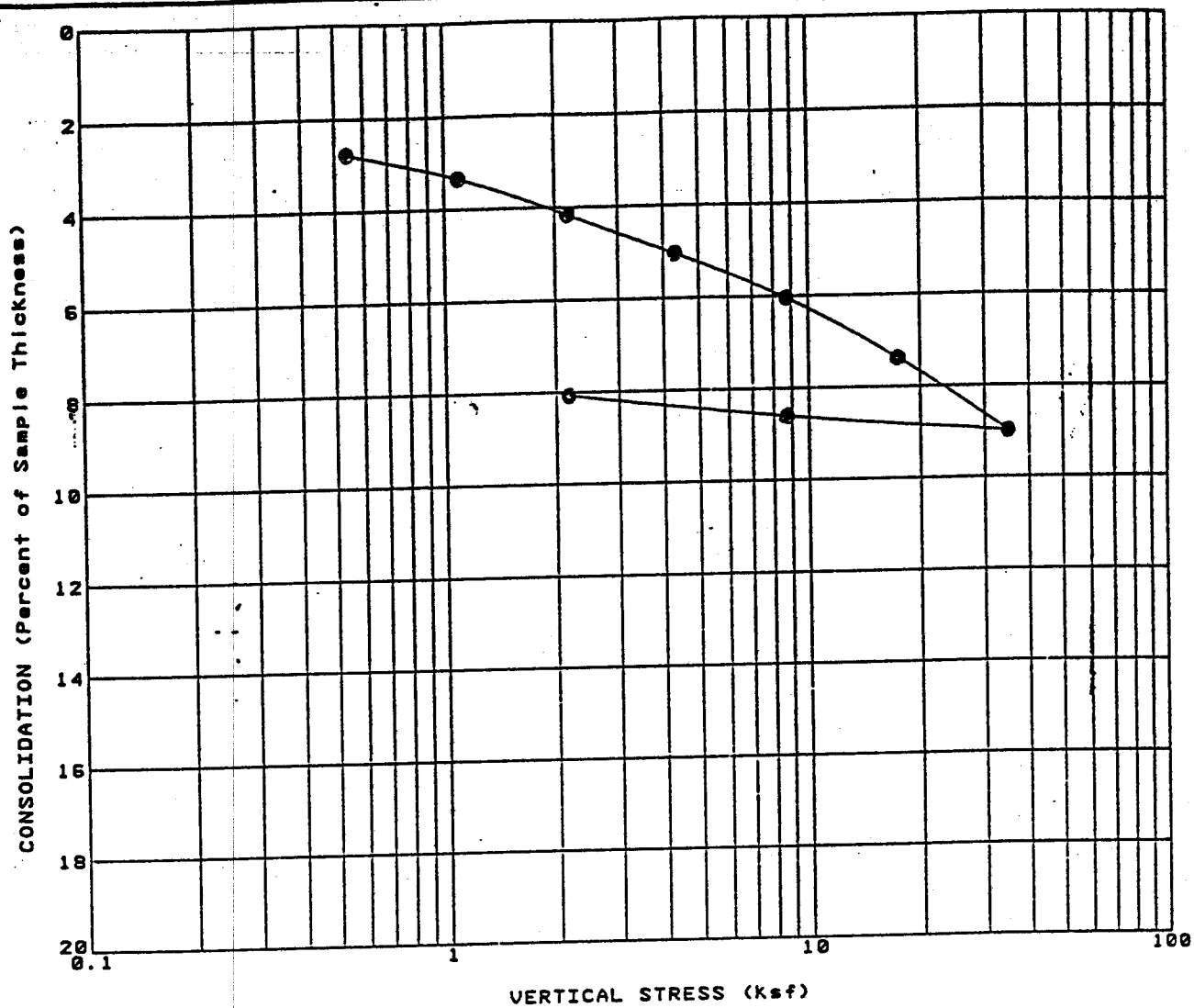
DIRECT SHEAR

Project No. 990127-001

Project Name Legacy - Neptune

Date

Figure No. C-1.2



LEGEND: ○ At Field Moisture
● After Addition of Water

Boring No.	LA-2A	Initial Dry Density (pcf)	
Sample No.	D-3	Initial Moisture Content (%)	
Depth (ft)	30.00		
Soil Type	SC	Final Moisture Content (%)	
Soil Description			

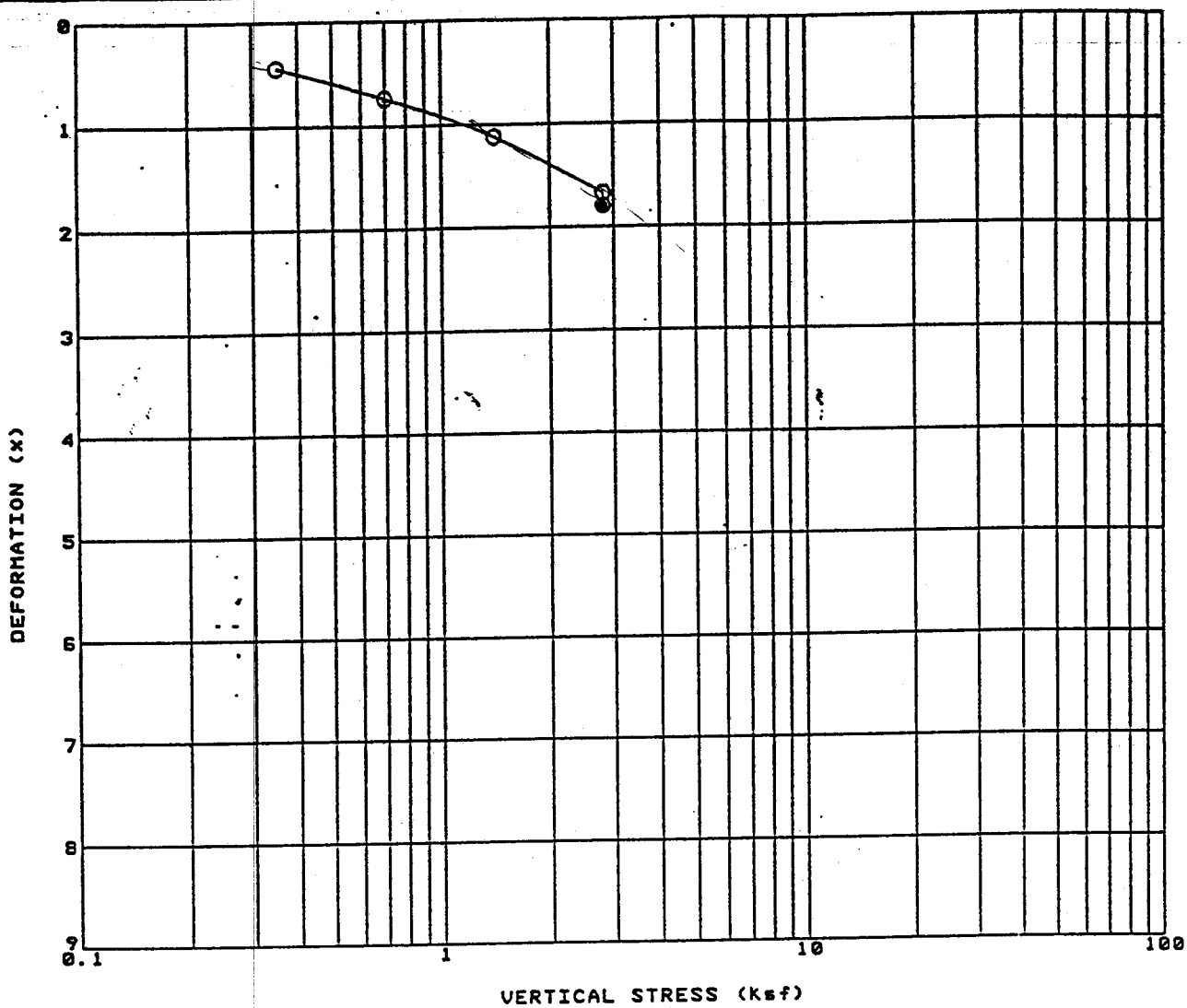
CONSOLIDATION CURVE

Project No. 990127-001

Project Name Legacy - Neptune

Date

Figure No. C-2.1



LEGEND: ○ At Field Moisture
● After Addition of Water

Boring No.	LA-1	Initial Dry Density (pcf)	
Sample No.	D-1	Initial Moisture Content (%)	
Depth (ft)	5.00		
Soil Type	SP	Final Moisture Content (%)	
Soil Description			

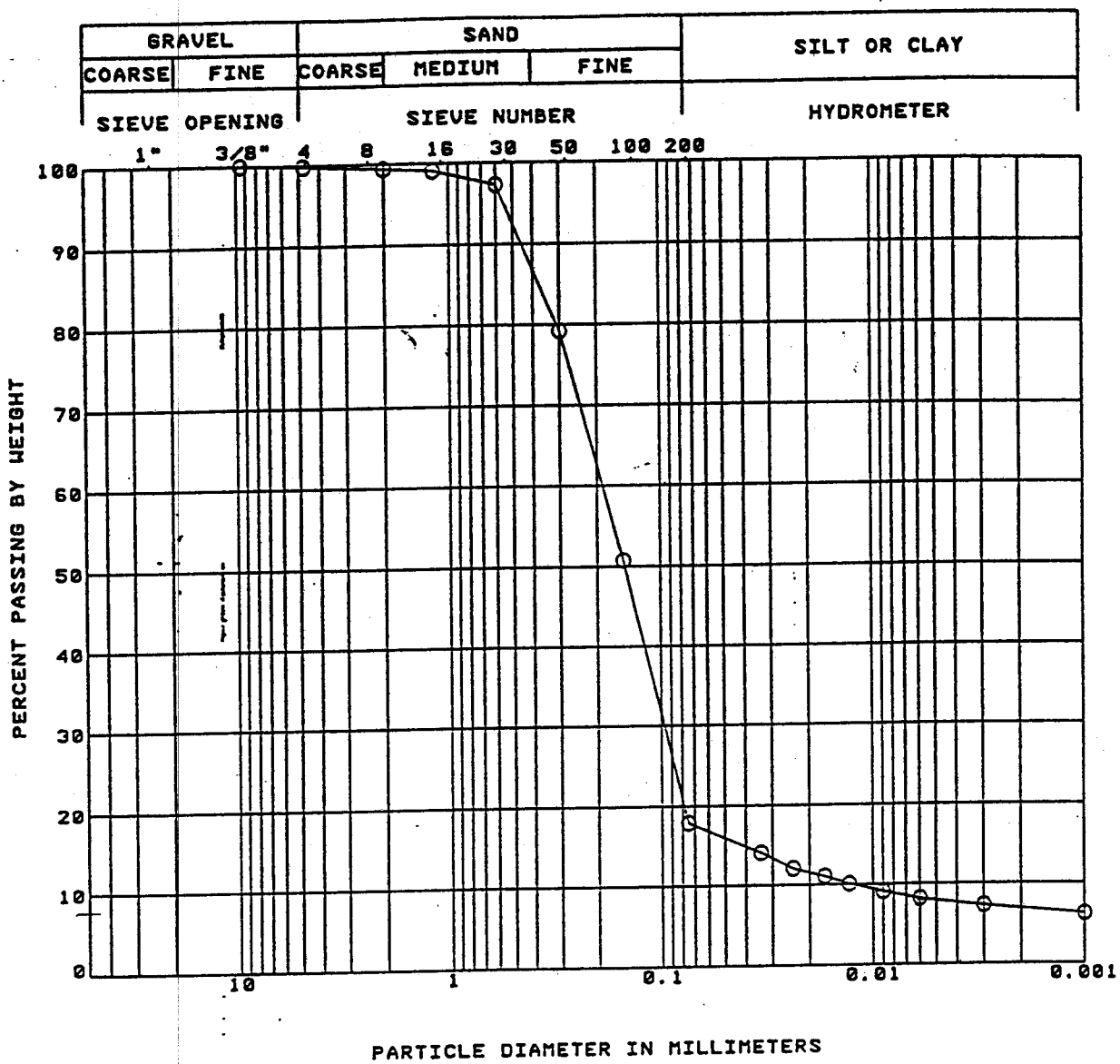
COLLAPSE POTENTIAL

Project No. 990127-001

Project Name Legacy - Neptune

Date

Figure No. C-2.2



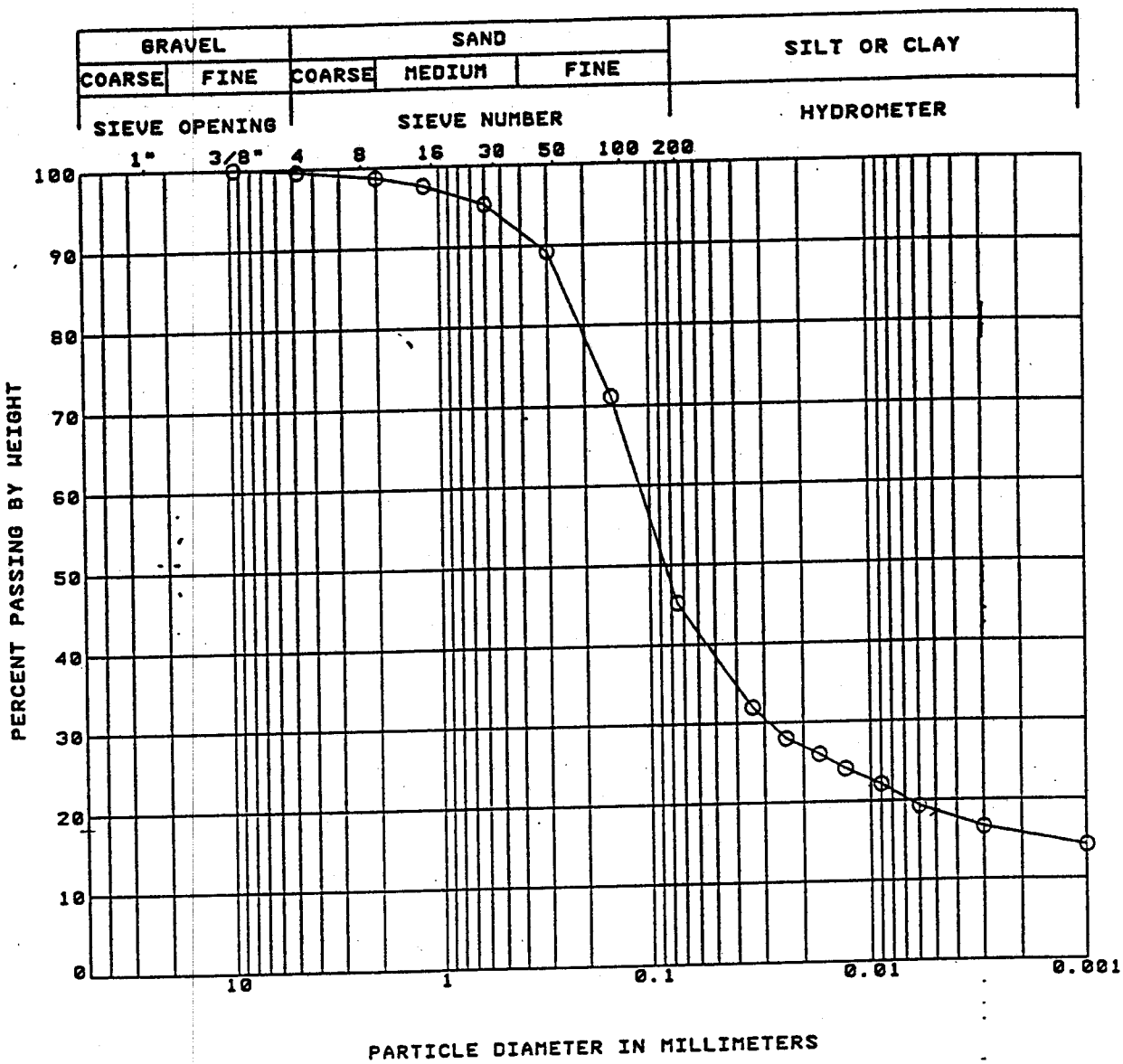
Symbol	Boring Number	Sample Number	Sample Depth (feet)	Field Moisture (%)	Soil Type
○	*LA-1*		*10*		

GRAIN SIZE DISTRIBUTION CURVE

Project No. *990127-001*

Project Name *Legacy - Neptune*

Date _____ Figure No. C-3.1



Symbol	Boring Number	Sample Number	Sample Depth (feet)	Field Moisture (%)	Soil Type
○	*LA-1*		*35*		

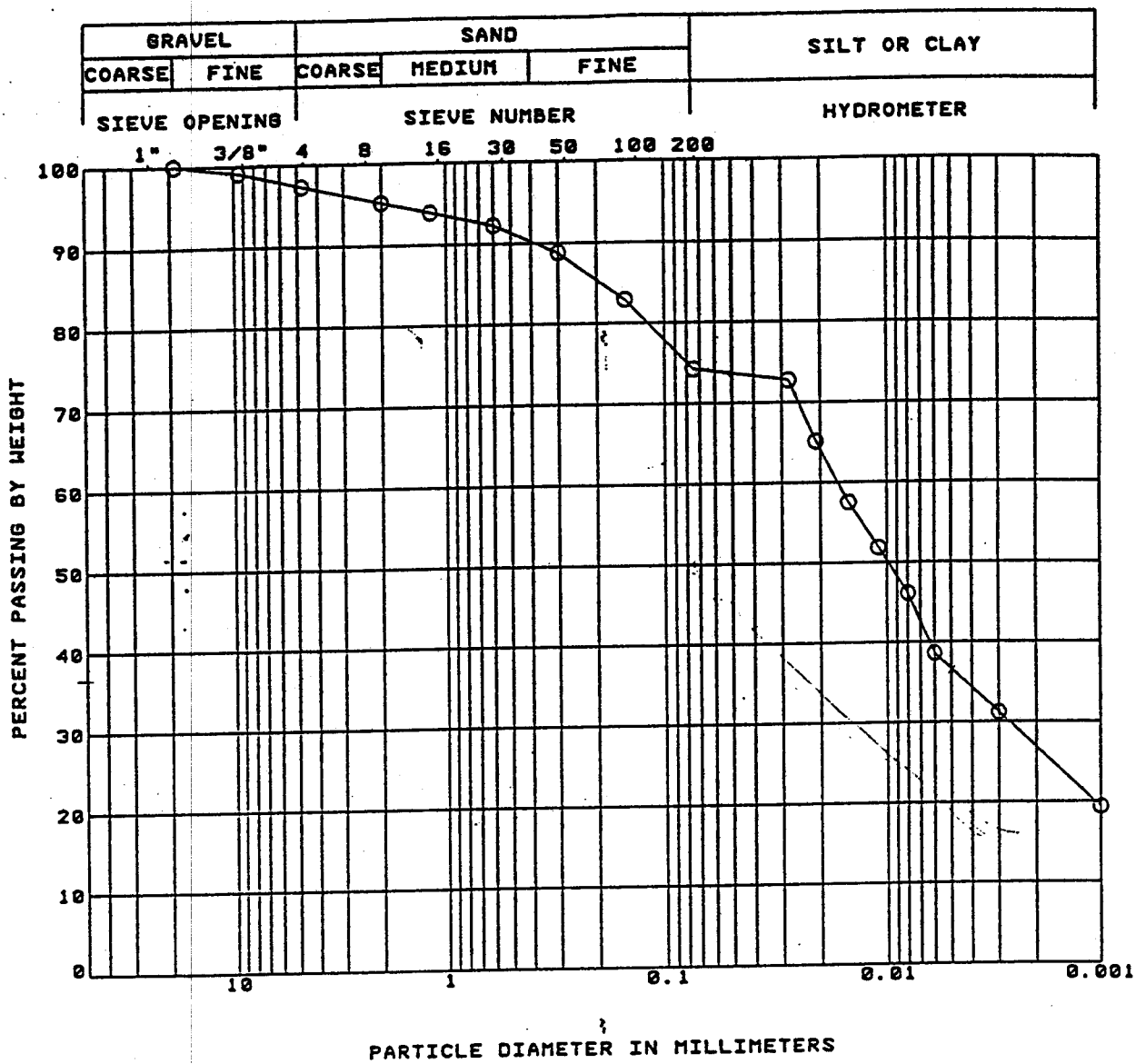
GRAIN SIZE DISTRIBUTION CURVE

Project No. *990127-001*

Project Name *Legacy - Neptune*

Date _____

Figure No. C-3.2



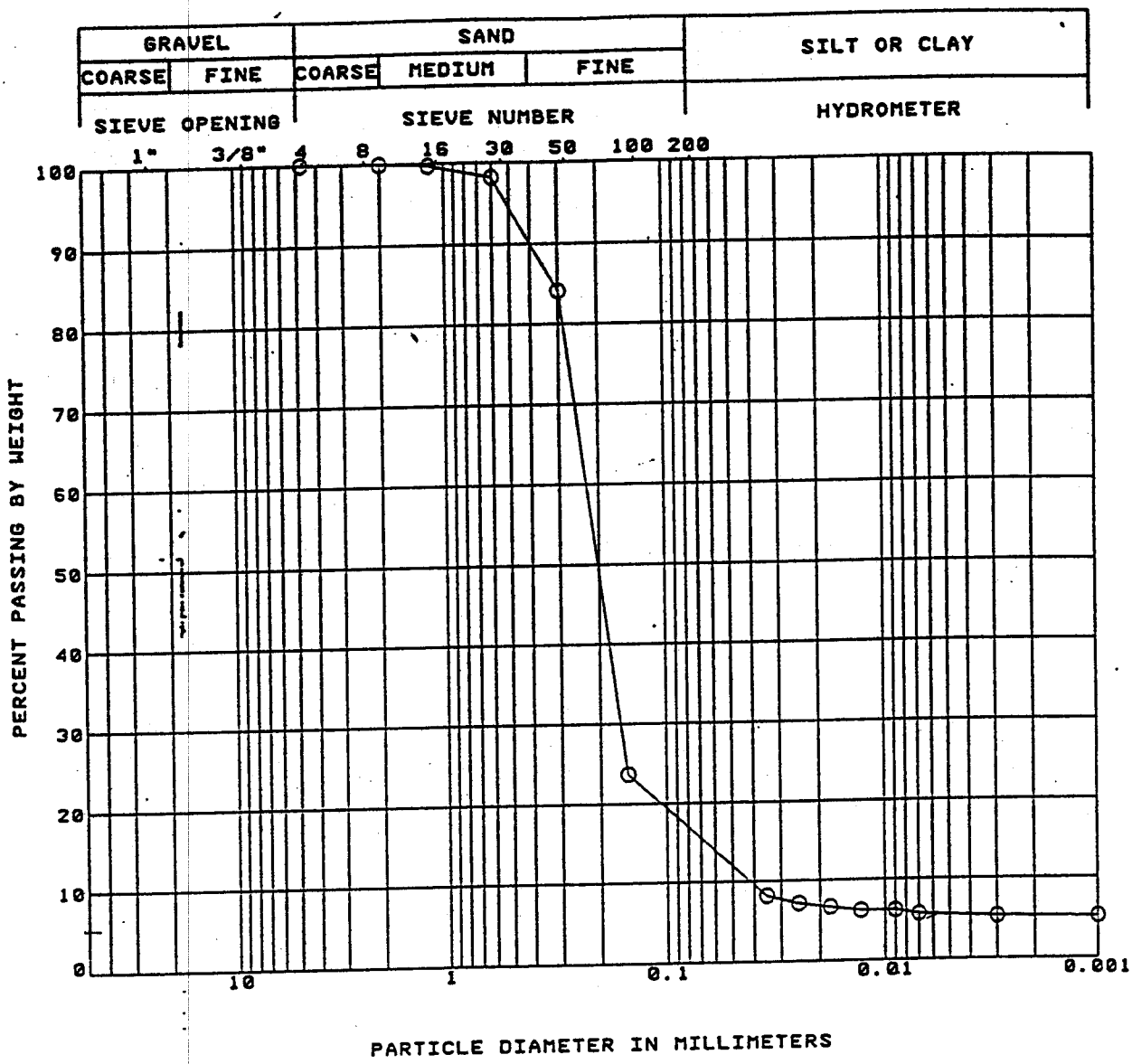
Symbol	Boring Number	Sample Number	Sample Depth (feet)	Field Moisture (%)	Soil Type
○	*LA-2A*		*15*		

GRAIN SIZE DISTRIBUTION CURVE

Project No. *990127-001*

Project Name *Legacy - Neptune*

Date _____ Figure No. C-3.3



Symbol	Boring Number	Sample Number	Sample Depth (feet)	Field Moisture (%)	Soil Type
○	*LA-2A*	*D-2*	*20*	*23.2*	*SP*

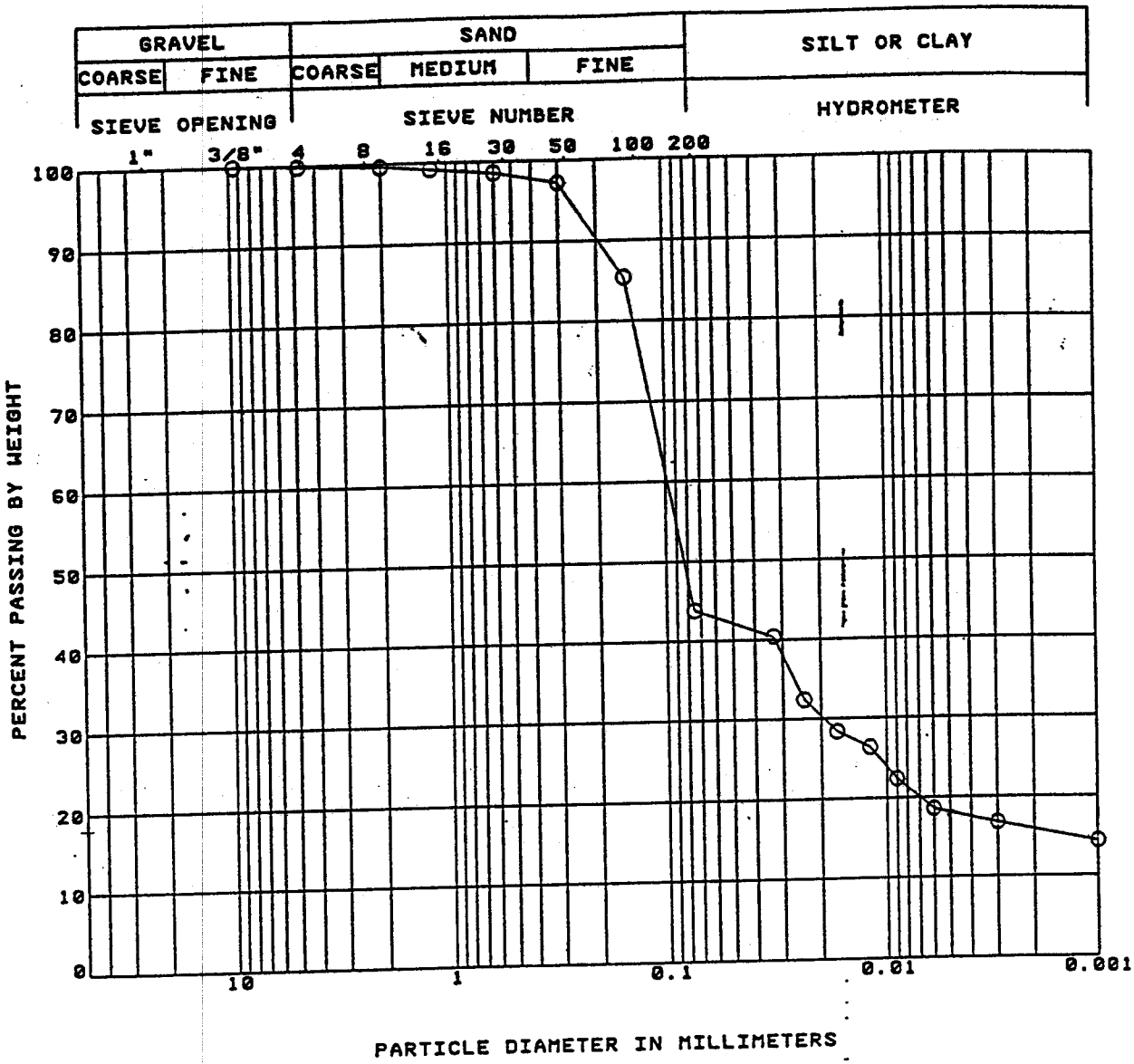
GRAIN SIZE DISTRIBUTION CURVE

Project No. *990127-001*

Project Name *Legacy - Neptune*

Date _____

Figure No. C-3.A



Symbol	Boring Number	Sample Number	Sample Depth (feet)	Field Moisture (%)	Soil Type
○	*LA-2A*		*35*		

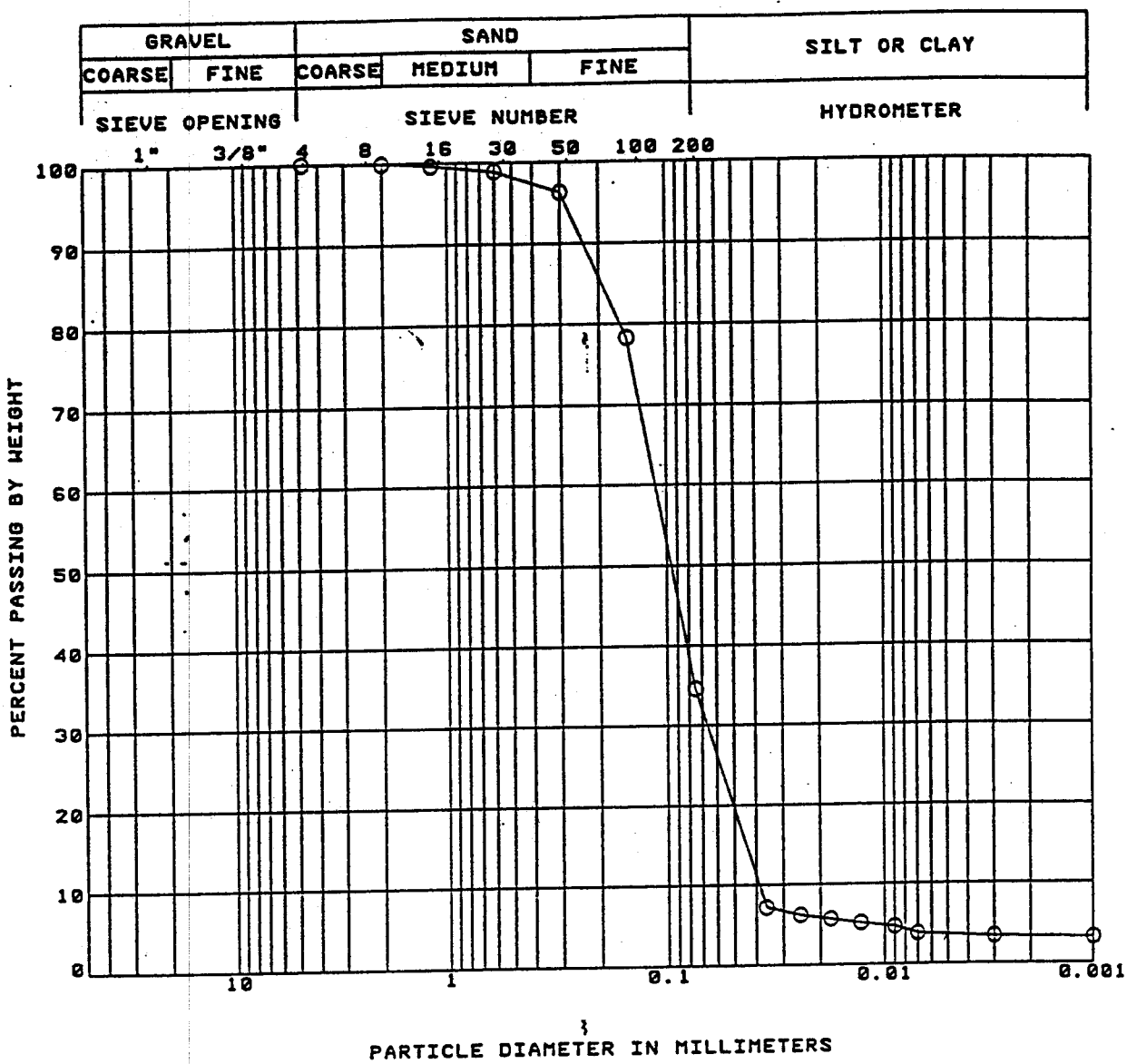
GRAIN SIZE DISTRIBUTION CURVE

Project No. *990127-001*

Project Name *Legacy - Neptune*

Date _____

Figure No. *C-3.5*



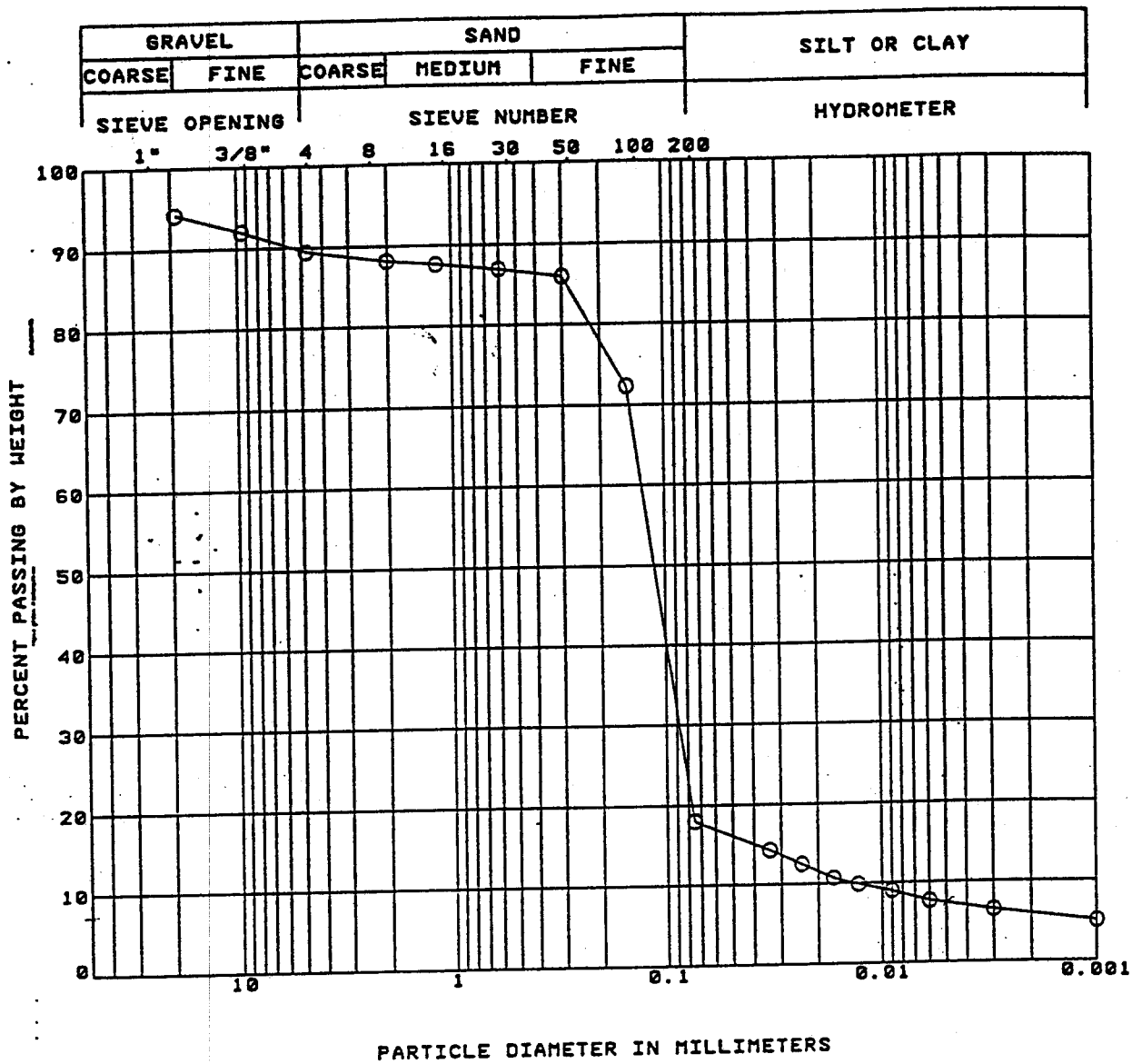
Symbol	Boring Number	Sample Number	Sample Depth (feet)	Field Moisture (%)	Soil Type
○	*LA-3*		*5*		

GRAIN SIZE DISTRIBUTION CURVE

Project No. *990127-001*

Project Name *Legacy - Neptune*

Date _____ Figure No. *C-3.6*



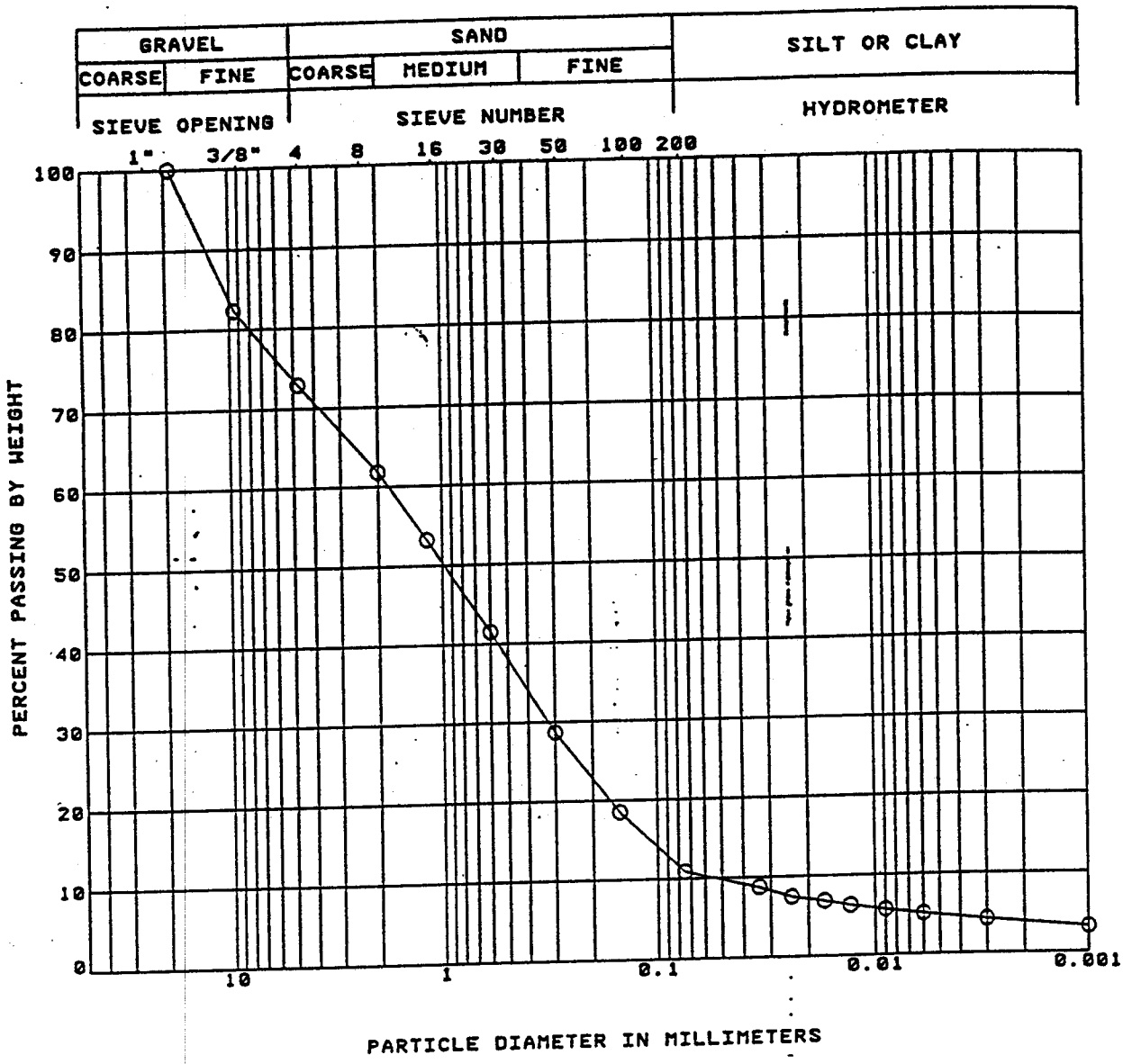
Symbol	Boring Number	Sample Number	Sample Depth (feet)	Field Moisture (%)	Soil Type
○	*LA-3*		*15*		

GRAIN SIZE DISTRIBUTION CURVE

Project No. *990127-001*

Project Name *Legacy - Neptune*

Date _____ Figure No. C-3.7



Symbol	Boring Number	Sample Number	Sample Depth (feet)	Field Moisture (%)	Soil Type
○	*LA-3*		*40*		

GRAIN SIZE DISTRIBUTION CURVE

Project No. *990127-001*

Project Name *Legacy - Neptune*

Date _____

Figure No. C-3.8

VAN BEVEREN & BUTELO, INC.

GEOTECHNICAL INVESTIGATION
PROPOSED HOTEL & PARKING STRUCTURE
MARINA DEL REY, CALIFORNIA

Van Beveren & Butelo, Inc. Project 04-012.3

Report of Geotechnical Investigation	October 23, 2006	Van Beveren & Butelo, Inc.
Response to Los Angeles County's Comments	January 7, 2008	Van Beveren & Butelo, Inc.

706 W. BROADWAY • SUITE 201 • GLENDALE, CALIFORNIA 91204 • TELEPHONE (818) 543-4560 • FAX (818) 543-4565

VAN BEVEREN & BUTELO, INC.

January 7, 2008

Mr. Mark Rousseau
Woodfin Suite Hotels, LLC
12730 High Bluff Drive, Suite 250
San Diego, California 92130

Subject: **Response to Comments by the County of Los Angeles**
Proposed Woodfin Suite Hotel and Timeshare Resort
Via Marina and Tahiti Way
Marina del Rey, Los Angeles County, California
for Woodfin Suite Hotels, LLC
Van Beveren & Butelo Project 04-012.3

Dear Mr. Rousseau:

This letter presents our response to comments raised by the County of Los Angeles in their Soils Engineering Review Sheet dated July 9, 2007. The review sheet, which is attached, was prepared in response to our report of geotechnical investigation dated October 23, 2006. For ease of reference each of the county's comments, along with our response, is presented below.

Comment 1. *Provide laboratory test results (e.g. percent clay sizes, Atterberg Limits, etc. per the Chinese criteria) to substantiate that the SC, Clayey Sand and SP-SC, Sand with Clay are not liquefiable. Provide revised liquefaction, dynamic settlement, and lateral spread analyses and revised mitigation measures as necessary.*

Response: The percent clay size, Atterberg Limits testing, and moisture content tests were performed on samples of the fine grained soils. The grain size analyses curves (including sieve and hydrometer) are shown in the Appendix of the report on Figures A-6.1 through A-6.14. The Atterberg Limits results are presented on the boring logs at the appropriate depths. These tests along with laboratory information from previous investigations as well as information from the cone soundings were used in the liquefaction evaluation.

The results of the liquid limit tests and clay fraction tests failed the Chinese criteria in each case. The fine-grained soils encountered in the borings were further evaluated using newer liquefaction criteria developed by Bray and Sancio[1] (2006). The fine-grained soil layers were classified as "not susceptible" to liquefaction using these criteria (which are based only on moisture content and Atterberg Limits testing). Accordingly, the general omission of the fine-grained soil layers from our prior liquefaction analyses is still considered acceptable. There is not a need to revise the analyses and recommended mitigation measures.

[1] ***Bray, J.D., and Sancio, R.B.,*** *2006, "Assessment of the Liquefaction Susceptibility of Fine-Grained Soils," Journal of Geotechnical and Geoenvironmental Engineering, Vol. 132, No. 9, September 2006, pp. 1165-1177.*

Comment 2. *Per the soils engineer, soil-cement column or stone columns to a distance 15 feet beyond the building footprints shall be used for ground improvement. Respond to Remark Nos. 3 or 4 respectively as follows.*

Response: No response requested. See below.

Comment 3. *If soil-cement columns (gravity containment walls) are proposed, then provide data and analyses to substantiate that the proposed soil-cement columns will be able to resist the lateral pressure due to lateral spreading. Provide substantiating calculations for the predicted lateral spread and mitigation measures. Provide thickness, depth, and locations of the proposed soil-cement columns, as necessary. Recommend revised mitigation measures as necessary. Revise the geotechnical map to show the locations of the soil-cement columns, as necessary.*

Response: As discussed on page 15 (paragraphs 5 and 6) and again on page 16 (paragraph 4) of our report, the recommended ground improvement for the site is vibro-replacement with stone columns. Soil-cement columns are only indicated if there is insufficient space beyond the buildings for densification, which at this time appears to not be the case. The soil-cement columns will not be used to contain liquefied soils. The limits of the vibro-replacement are shown on the attached Plot Plan.

Comment 4. *If stone columns are proposed, then provide or address the following:*

a. *Provide performance criteria (with a factor of safety of at least 1.25) that will ensure the soils between the installed columns will have adequate strength against lateral spreading.*

b. *Provide data and analyses to substantiate that the perimeter stone columns will be able to resist the lateral pressure due to lateral spreading of the liquefiable soils beyond the stone column perimeter (i.e. liquefiable soils between the existing seawall the proposed mitigation measures). Recommend revised mitigation measures as necessary.*

c. *Address the lateral support (or lack of lateral support) of the perimeter stone columns if the soils beyond the stone column perimeter (i.e. liquefiable soils between the existing seawall the proposed mitigation measures) fail as a result of lateral spreading. Recommend revised mitigation measures as necessary.*

Response: a) The performance criteria, to mitigate the potential for lateral spreading and significantly reduce the risk of settlement due to liquefaction, is to raise the in-situ SPT N-values to a minimum of 20 in the estuary deposits. As discussed in our report, this can be accomplished by using a vibrating probe and stone columns spaced at 6 to 12 feet on centers across the entire site. The recommended spacing of the stone columns will be adjusted to ensure adequate densification of potentially liquefiable soils between the stone columns.

The algorithm used in the Youd (2002) methodology to compute lateral spread indicates that significant displacements are unlikely if the SPT N-values are greater than 15. Since the mitigation plan is to raise the SPT N-value to a minimum of 20, the soils between the installed stone columns would have adequate strength against lateral spreading.

As recommended, an evaluation program will be implemented based on an initial test densification area and will be verified during construction.

b) Because potential lateral spreading would induce movements toward the marina free face (i.e. in an easterly direction), it is our opinion that the stone column perimeter along the east side of the site would not experience any additional pressure due to lateral spreading of the soils between the existing seawall and the proposed mitigation.

c) As stated in our report, our recommendation is to remediate the soils 15 feet beyond the building footprints in plan where possible. Therefore, if the soil beyond the stone column perimeter were to fail as a result of lateral spreading as postulated by the reviewers, lateral support would be provided to the conference center mat foundation by passive resistance of the footing against the 15 foot remediated soil buffered zone beyond the building footprint. Likewise, lateral support would be provided to the hotel tower pile foundations by the 15-foot remediated soil buffered zone beyond the building footprint.

Comment 5. *Address the possible impact of uplift for the proposed construction/development. Provide recommendations as necessary.*

Response: Hydrostatic uplift forces will occur on the subterranean portion of the project due to groundwater. Hydrostatic design of floor slabs and basement walls is addressed on page 25 of our report.

Comment 6. *Provide SPT-CPT correlations utilized for the liquefaction analyses within the submitted report.*

Response: Both SPT N-values and CPT tip resistances were used directly in the liquefaction evaluation. SPT N-values were not converted to equivalent CPT values; nor were CPT values converted to equivalent SPT values. Non-standard N-values obtained from the modified California sampler were converted to approximate SPT N-values by multiplying by 0.63.

Comment 7. *Provide substantiating calculations for the proposed temporary shoring. Revise recommendations as necessary.*

Response: Calculations of lateral pressures on temporary shoring are attached. Revised recommendations are not necessary.

Comment 8. *Clarify recommendations regarding "Design of Soldier Piles". Verify the details, locations, and use of the proposed soldier piles as necessary.*

Response: In our report, we presented data for design of the soldier piles, including a passive resistance of 300 pounds per cubic foot and recommended active pressures. The actual design of the soldier piles, including the locations, spacing, length and type of pile is the responsibility of the shoring designer. We will review and sign the shoring design drawings when they are completed.

Comment 9. *On Figure 6.1 and 6.2 states that group piles will be utilized on the subject site. Verify and clarify proposed pile group details, locations, and use, as necessary.*

Response: Pile group details and locations can only be clarified once more complete foundation information based on the structural drawings is developed. This information is currently unavailable.

Comment 10. *Show all mitigation measures for liquefaction and lateral spreading on the geotechnical map.*

Response: Figure 1, Plot Plan, has been revised to show the outline of the vibro-replacement and stone column mitigation plan.

Comment 11. *Include a copy of this review sheet with your response.*

Response: The review sheet is attached.

We appreciate the opportunity to be of continued service to you on this project. Please call if you should have any questions or if we can be of further assistance.

Sincerely,
Van Beveren & Butelo, Inc.

REGISTERED PROFESSIONAL ENGINEER
MARK R. TUFENKJIAN
No. C53716
Exp. 06/30/09
CIVIL
STATE OF CALIFORNIA

Mark Tufenkjian, Ph.D.
Senior Engineer

REGISTERED PROFESSIONAL ENGINEER
JAMES L. VAN BEVEREN
No. GE852
Exp. 6/30/09
GEOTECHNICAL
STATE OF CALIFORNIA

James L. Van Beveren
Principal Engineer
President

04-012.3 l02/MT:ay
(2 copies submitted)

Attachments: County of Los Angeles Review Sheet dated July 9, 2007
Plot Plan with Limits of Liquefaction Mitigation
Shoring Pressure Calculations (2 Sheets)

copy: (2) Armbruster & Goldsmith, LLC
Attn: Mr. Aaron Clark
(1) John A. Martin and Associates
Attn: Mr. Charles Whittaker
(2) County of Los Angeles
Geotechnical & Materials Engineering Division
(2) Gin Wong Associates
Attn: Mr. Bruce Bailey
(1) Impact Sciences, Inc.
Attn: Eric Sakowicz

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
GEOTECHNICAL AND MATERIALS ENGINEERING DIVISION

SOILS ENGINEERING REVIEW SHEET

Address: 900 S. Fremont Ave., Alhambra, CA 91803
Telephone: (626) 458-4925
Fax: (626) 458-4913

District Office 12.0
Job Number GMTR
Sheet 1 of 1

Hotel Buildings and Parking Structure
Tract 67861
Location Via Mariana and Tahiti Way, Marina Del Rey
Developer/Owner Woodfin Suite Hotels, LLC
Engineer/Architect ------
Soils Engineer Van Beveren & Butelo, Inc. (04-012.3)
Geologist Same as above

DISTRIBUTION:
___ Drainage
___ Grading
1 Geo/Soils Central File
___ District Engineer
1 Geologist
1 Soils Engineer
1 Engineer/Architect

Review of:
Soils Engineering and Geologic Report Dated **10/23/06**

REMARKS:

1. Provide laboratory test results (e.g., percent clay sizes, Atterberg Limits, etc. per the Chinese criteria) to substantiate that the SC, Clayey Sand and SP-SC, Sand with Clay are not liquefiable. Provide revised liquefaction, dynamic settlement, and lateral spread analyses and revised mitigation measures as necessary.

2. Per the soils engineer, soil-cement column or stone columns to a distance 15 feet beyond the building footprints shall be used for ground improvement. Respond to Remark Nos. 3 or 4 respectively as follow.

3. If soil-cement columns (gravity containment walls) are proposed, then provide data and analyses to substantiate that the proposed soil-cement columns will be able to resist the lateral pressure due to lateral spreading. Provide substantiating calculations for the predicted lateral spread and mitigation measures. Provide thickness, depth, and locations of the proposed soil-cement columns, as necessary. Recommend revised mitigation measures as necessary. Revise the geotechnical map to show the locations of the soil-cement columns, as necessary.

4. If stone columns are proposed, then provide or address the following:
   a. Provide performance criteria (with a factor of safety of at least 1.25) that will ensure the soils between the installed columns will have adequate strength against lateral spreading.
   a. Provide data and analyses to substantiate that the perimeter stone columns will be able to resist the lateral pressure due to lateral spreading of the liquefiable soils beyond the stone column perimeter (i.e. liquefiable soils between the existing seawall the proposed mitigation measures). Recommend revised mitigation measures as necessary.
   b. Address the lateral support (or lack of lateral support) of the perimeter stone columns if the soils beyond the stone column perimeter (i.e. liquefiable soils between the existing seawall the proposed mitigation measures) fail as a result of lateral spreading. Recommend revised mitigation measures as necessary.

5. Address the possible impact of uplift for the proposed construction/development. Provide recommendations as necessary.

6. Provide the SPT-CPT correlations utilized for the liquefaction analyses within the submitted report.

7. Provide substantiating calculations for the proposed temporary shoring. Revise recommendations as necessary.

8. Clarify recommendations regarding "Design of Soldier Piles". Verify the details, locations, and use of the proposed soldier piles as necessary.

9. On Figure 6.1 and 6.2 states that group piles will be utilized on the subject site. Verify and clarify proposed pile group details, locations, and use, as necessary.

10. Show all mitigation measures for liquefaction and lateral spreading on the geotechnical map.

11. Include a copy of this review sheet with your response.

NOTE(S) TO THE PLAN CHECKER/BUILDING AND SAFETY ENGINEER:
ON-SITE SOILS ARE SEVERELY CORROSIVE TO CONCRETE AND FERROUS METALS.

REGISTERED PROFESSIONAL ENGINEER YOSHIYA MORISAKU No. 67587 Exp. 6/30/07 CIVIL STATE OF CALIFORNIA

Reviewed by Yoshiya Morisaku Date 7/9/07

NOTICE: Public safety, relative to geotechnical subsurface exploration, shall be provided in accordance with current codes for excavations, inclusive of the Los Angeles County Code, Chapter 11.48, and the State of California, Title 8, Construction Safety Orders.

P:\Yosh\67861TentT, Via Marina and Tahiti Wy, Marina Del Rey, MP-NA_1

County of Los Angeles Department of Public Works
GEOTECHNICAL AND MATERIALS ENGINEERING DIVISION
GEOLOGIC REVIEW SHEET
900 So. Fremont Ave., Alhambra, CA 91803
TEL. (626) 458-4925

DISTRIBUTION
1 Geologist
__ Soils Engineer
1 GMED File
1 Subdivision

TENTATIVE TRACT MAP 67861
SUBDIVIDER Woodfin Suite Hotels, LLC
ENGINEER Hunsaker & Associates
GEOLOGIST Van Beveren & Butelo, Inc.
SOILS ENGINEER Van Beveren & Butelo, Inc.

TENTATIVE MAP DATED 11/22/07
LOCATION Marina Del Rey

REPORT DATE 10/23/06
REPORT DATE 10/23/06

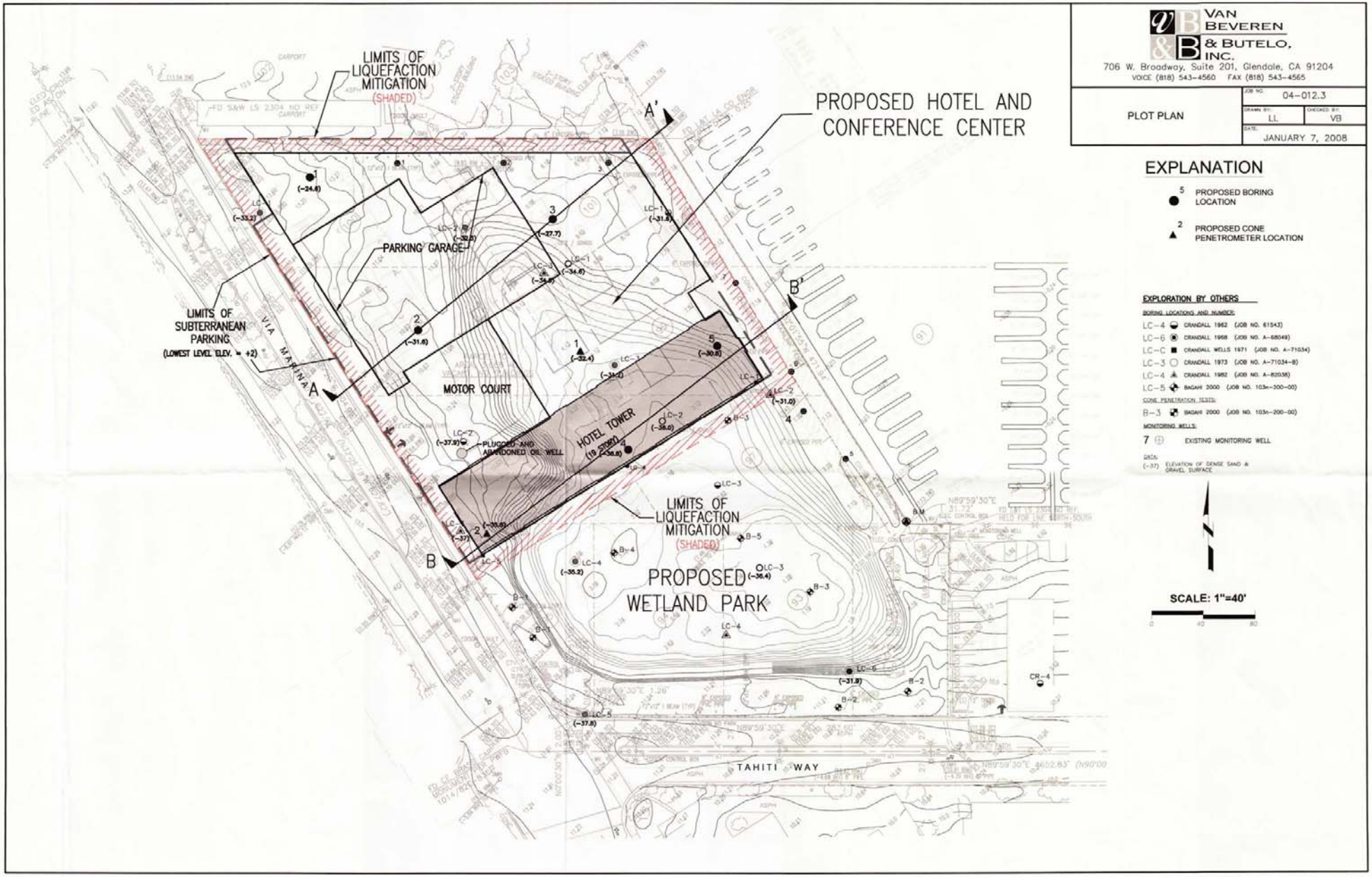
The Regional Planning Commission, developer, and engineer are advised that:

PRIOR TO RECOMMENDING APPROVAL OF THE TENTATIVE TRACT OR PARCEL MAP:

1. The Soils Engineering review dated 7/9/07 is attached.

NOTE Provide a copy of this review with your resubmittal

repared by _____ Reviewed by _____ Date 7/14/07
Charles Nestle



VAN BEVEREN & BUTELO, INC.
706 W. Broadway, Suite 201, Glendale, CA 91204
VOICE (818) 543-4560 FAX (818) 543-4565

PLOT PLAN	JOB NO. 04-012.3	
	DRAWN BY: LL	CHECKED BY: VB
	DATE: JANUARY 7, 2008	

PASSIVE PRESSURE AND FRICTION

Client: Woodfin - Cantilevered Shoring

Job No.: 04-12.3 By: MT Date: 1/6/2008

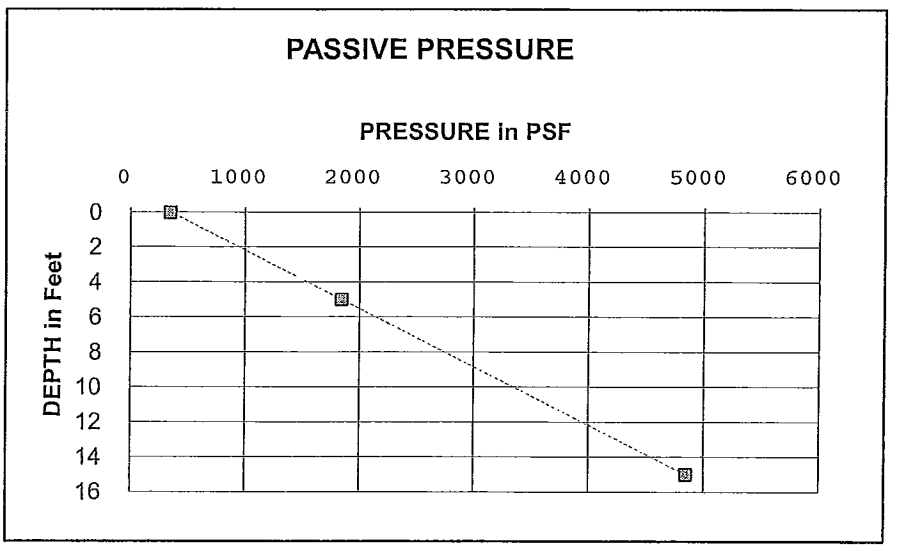
SOIL PROPERTIES		SOIL FACTORS	
Unit Weight (pcf)	100	SQRT(Nphi)	1.73
Cohesion (psf)	100	Nphi	3.00
Friction Angle (deg)	30.0		

SOIL FRICTION FACTOR 0.58

PASSIVE PRESSURE

Pp =(2*COHESION*sqrt(Nphi)) + (UNIT WEIGHT*DEPTH*Nphi)

Pp =	346	psf +	300.0	pcf *	DEPTH (feet)
Pp =	346	psf at a depth of	0.0	feet	
Pp =	1846	psf at a depth of	5.0	feet	
Pp =	4846	psf at a depth of	15.0	feet	



ACTIVE PRESSURE

Client: Woodfin - Cantilevered Shoring

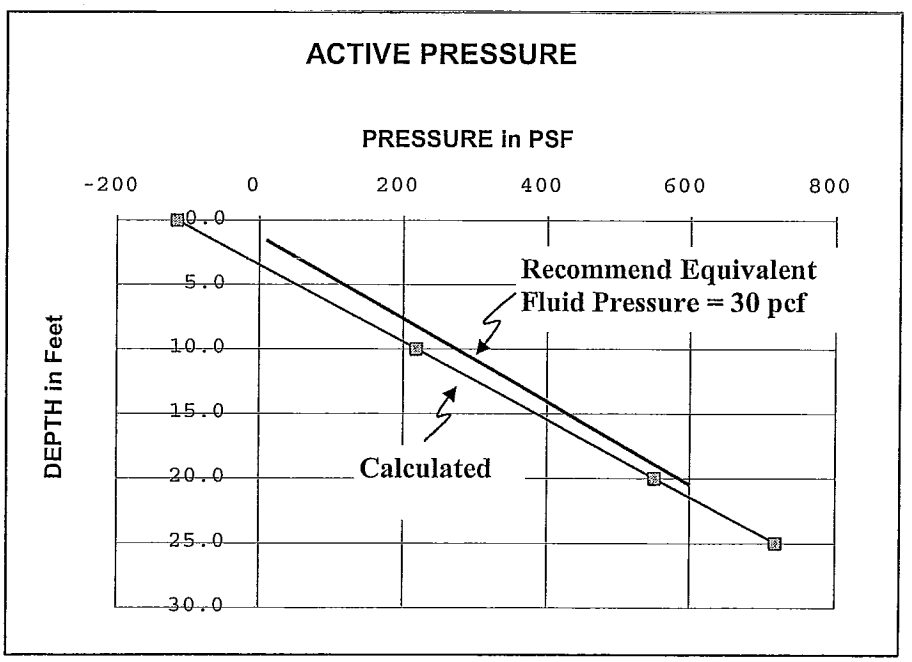
Job No.: 04-12.3 By: MT Date: 1/6/2008

SOIL PROPERTIES		SOIL FACTORS	
Unit Weight (pcf)	100	SQRT(Nphi)	1.73
Cohesion (psf)	100	Nphi	3.00
Friction Angle (deg)	30.0		

ACTIVE PRESSURE

Pa = -(2*COHESION/sqrt(Nphi)) + (UNIT WEIGHT*DEPTH/Nphi)

Pa =	-115	psf +	33.3	pcf * DEPTH (feet)	
Pa =	-115	psf at a depth of	0.0	feet	
Pa =	218	psf at a depth of	10.0	feet	
Pa =	551	psf at a depth of	20.0	feet	
Pa =	718	psf at a depth of	25.0	feet	



VAN BEVEREN & BUTELO, INC.

REPORT OF GEOTECHNICAL INVESTIGATION
PROPOSED WOODFIN SUITE
HOTEL AND TIMESHARE RESORT

VIA MARINA AND TAHITI WAY
MARINA DEL REY, LOS ANGELES COUNTY, CALIFORNIA

Prepared for:

WOODFIN SUITE HOTELS, LLC

San Diego, California

October 23, 2006

Van Beveren & Butelo Project 04-012.3

VAN BEVEREN & BUTELO, INC.

October 23, 2006

Mr. Mark Rousseau
Woodfin Suite Hotels, LLC
12730 High Bluff Drive, Suite 250
San Diego, California 92130

Subject: **Report of Geotechnical Investigation**
Proposed Woodfin Suite Hotel and Timeshare Resort
Via Marina and Tahiti Way
Marina del Rey, Los Angeles County, California
for Woodfin Suite Hotels, LLC
Van Beveren & Butelo Project 04-012.3

Dear Mr. Rousseau:

We are pleased to submit the results of our geotechnical investigation for the proposed Marina del Rey, Woodfin Suite Hotel and Timeshare Resort. This investigation was conducted in general accordance with our proposal dated June 13, 2005, as authorized by you on May 8, 2006.

The scope of this investigation was planned with you and with Mr. Gin Wong of Gin Wong Associates. We were provided with information on the features of the project by Mr. Wong and by Mr. Charles Whittaker of John A. Martin and Associates. We discussed our findings and conclusions with members of the design team and were provided with information on ground improvement options by Mr. Jack Kinley of Hayward Baker Company.

The findings of this investigation are described in the report and data is presented for input into the EIR, for foundation design and construction of the project.

Sincerely,
Van Beveren & Butelo, Inc.

REGISTERED PROFESSIONAL ENGINEER FRANCISCO J. ARAGON No. C69790 Ex 06-30-08 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER MARK R. TUFENKJIAN No. C53716 Exp. 06/30/07 CIVIL STATE OF CALIFORNIA

Francisco Aragon
Project Engineer

Mark Tufenkjian, Ph.D.
Senior Engineer

PROFESSIONAL GEOLOGIST JOHN J. BUTELO No. 1150 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER JAMES L. VAN BEVEREN No. GE852 Exp. 6/30/07 GEOTECHNICAL STATE OF CALIFORNIA

John Jeffrey Butelo
Principal Engineering Geologist/Vice President

James L. Van Beveren
Principal Engineer/President

04-012.3 r01/VB:ay
(3 copies submitted)

cc: (2) Armbruster & Goldsmith, LLC
Attn: Mr. Aaron Clark
(1) John A. Martin and Associates
Attn: Mr. Charles Whittaker
(2) County of Los Angeles
Geotechnical & Materials Engineering Division
(2) Gin Wong Associates
Attn: Mr. Gin Wong
(1) Impact Sciences, Inc.
Attn: Eric Sakowicz

VAN BEVEREN & BUTELO, INC.

REPORT OF GEOTECHNICAL INVESTIGATION
PROPOSED WOODFIN SUITE
HOTEL AND TIMESHARE RESORT

VIA MARINA AND TAHITI WAY
MARINA DEL REY, LOS ANGELES COUNTY, CALIFORNIA

Prepared for:

WOODFIN SUITE HOTELS, LLC

San Diego, California

Van Beveren & Butelo, Inc.

October 23, 2006

Van Beveren & Butelo Project 04-012.3

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SUMMARY

We have completed our geotechnical investigation of the site of the proposed Woodfin Suite Hotel and Timeshare Resort in Marina del Rey, Los Angeles County, California. The project will consist of a 19-story hotel/timeshare tower and a 3- to 5-story parking structure and conference center. The entire project will be underlain by one level of subterranean parking. Our subsurface explorations, engineering analyses, and foundation design recommendations are summarized below.

We explored the soil conditions at the site by drilling 5 borings and performing 2 cone penetration tests. Fill soils, 1½ to 11 feet thick, were found in our borings. The natural soils consist of recent estuary deposits underlain by dense sand and gravel. The estuary deposits consist of sands, silts and clays and vary from loose to medium stiff.

The estuary deposits are subject to liquefaction in the event a large earthquake were to occur near the site. The site is adjacent to a turning basin in the Marina and the liquefaction could result in lateral spreading towards the basin.

We recommend that the liquefaction and lateral spreading hazard be mitigated by densification of the estuary deposits. If this were performed, the conference center could be supported on a mat foundation. The hotel/timeshare tower should be supported on deep foundations extending into the dense sand and gravel.

SCOPE

This report provides foundation design information for the proposed Woodfin Suite Hotel and Timeshare Resort. The locations of the proposed project and our exploration borings are shown on Figure 1, Plot Plan.

The property had been previously investigated by LeRoy Crandall and Associates and by Bagahi Engineering. The prior LeRoy Crandall and Associates borings were drilled to depths of 13 to 100 feet; Crandall also installed 3 shallow wells. Bagahi Engineering drilled borings and performed cone penetration tests on the site. We submitted the results of our Phase 1 geotechnical investigation, which was based entirely on a review of the previously developed data, in a report dated February 18, 2004. A listing of the previous reports is presented at the end of this report. The locations of previous explorations are shown on Figure 1, Plot Plan along with our current explorations.

This investigation was authorized to determine the static physical characteristics of the soils at the site of the proposed Woodfin Suite Hotel and Timeshare Resort, and to provide a discussion of the geologic setting and hazards and recommendations for foundation design, floor slab support, and grading for the development along with recommendations to mitigate the hazards.

We were to evaluate the existing soil and groundwater conditions at the site, including the corrosion potential of the soils, and to develop recommendations for the following:

- A feasible foundation system along with the necessary design parameters, including the estimated settlements due to the expected loadings.
- Subgrade preparation and floor slab support.
- Design of basement and retaining walls.
- Subgrade preparation and design of asphalt paving.
- Grading, including site preparation, excavation and slopes, the placing of compacted fill, and quality control measures relating to earthwork.

This investigation included ground motion studies for seismic design. The ground motion studies included design criteria for the current 2001 California Building Code, which is based on the 1997 Uniform Building Code, and for the 2006 International Building Code, which is anticipated to be adopted by the County of Los Angeles in 2008.

The scope of this investigation did not include an assessment of general site environmental conditions for the presence of contaminants in the soils and groundwater of the site. The site is in a methane study zone and methane studies are being performed by Methane Specialists.

Our recommendations are based on the results of our field explorations, laboratory tests, and appropriate engineering analyses. The results of our field explorations and laboratory tests, which form the basis of our recommendations, are presented in Appendix A. The data obtained from previous investigations was also used to form our conclusions and recommendations and are presented in Appendix B.

Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has been prepared for Woodfin Suite Hotels, LLC and their design consultants to be used solely in the design of the proposed Woodfin Suite Hotel and Timeshare Resort. The report has not been prepared for use by other parties, and may not contain sufficient information for purposes of other parties or other uses.

PROJECT DESCRIPTION

Woodfin Suite Hotels, LLC plans to construct a Hotel and Timeshare Resort at the location shown on Figure 1. The project will include a 19-story hotel, a 3- to 4-story conference center, and a 5-level parking garage. The entire project will be underlain by one level of subterranean parking. The site is located within Marina del Rey and is bordered on the east by Turning Basin B. A concrete retaining wall separates the site from the basin. A wetland park will be constructed on the south side of the site. Significant grading is not anticipated in the wetland park.

The structural features of the project have not been definitely established at this time. The project will either be of reinforced concrete or steel frame construction. If the project is of steel construction, interior column loads in the hotel/timeshare tower are anticipated to be about 1,600 kips and exterior column loads about 800 kips. If concrete construction is used, the tower column loads will range from 1,000 to 2,000 kips. Column loads in the conference center and parking structure will be about 800 kips if steel construction is used and 1,000 kips if the building is of concrete construction.

The entire project will be underlain by one level of subterranean parking extending to Elevation +2. The perimeter of the site along the north, east and west sides varies from about Elevation +7 to +13; excavation ranging from about 5 feet to 11 feet deep will be required at these locations to achieve the desired grade. Within the central portion of the site and along the south side of the site, the existing grade is as low as Elevation +3 and only nominal excavation will be required.

SITE CONDITIONS

The site is within Marina del Rey adjacent to Turning Basin B and is vacant. The area was developed by placing hydraulic fill dredged during the initial development of Marina del Rey. The site was partially excavated in 1984 for another project, which was not built. Up to 8 feet of earth was removed, so that a portion of the south side of the site is as low as Elevation +2 (Mean Sea Level datum). The edges of the property are still at or near street grade.

Some 51 pre-stressed concrete piles were driven on the site in 1984, and steel H-piles were driven for future shoring along the south, west and north property lines. Several of the concrete piles were capped with a concrete beam above grade, and a sewer manhole is exposed nearby. The concrete piles were 12 inches square and varied from about 45 to 50 feet in total length and included batter piles and vertical piles. The installation of these piles was observed by LeRoy Crandall and Associates. We did not find any evidence that the installation of the perimeter H-piles was observed by a geotechnical professional. A rough measurement determined that the H-piles are a 12-inch section with 5/8-inch web and flange thickness (BP74). The lengths of these steel piles are yet undetermined, but are spaced at about 8-foot intervals.

The site is separated from Basin B by a concrete bulkhead wall, reportedly supported on a driven pile foundation. The piles were reportedly installed both vertically and battered. The wall is cantilevered and we do not believe that there are any tie backs or deadmen extending onto the hotel site. The County has advised us that the seawall is not capable of resisting lateral forces resulting from earthquake or liquefaction and its supporting capability should be ignored.

The site is within the Playa Del Rey Oil Field. Based on a State of California, Division of Oil, Gas and Geothermal Resources map dated June 23, 1986, one plugged and abandoned oil well exists on the site. The approximate location of the well is shown on Figure 1.

SUBSURFACE EXPLORATIONS AND LABORATORY TESTS

We explored the site by drilling 5 borings to depths of 50 to 75 feet below the existing grade and by performing 2 cone penetration tests to depths of 75 feet. The locations of these explorations are also shown on Figure 1. Details of the explorations and the logs of the borings are presented in Appendix A.

The site was originally explored by LeRoy Crandall and Associates for an apartment project in 1962 and again in 1982 for a hotel project; neither of these projects were ever constructed. More recently, a preliminary investigation was performed by Bagahi Engineering. The previous explorations include 17 borings drilled by LeRoy Crandall and Associates to depths of 13 to 100 feet and 3 shallow wells. Bagahi Engineering drilled 5 borings and performed 3 cone penetrometer tests on the site. The locations of all of the prior explorations are shown on Figure 1. Logs of the previous explorations are presented in Appendix B.

Laboratory tests were performed on selected samples obtained from the borings to aid in the classification of the soils and to determine the pertinent engineering properties of the foundation soils. The following tests were performed:

- Moisture content and dry density determinations
- Direct shear
- Consolidation
- Sieve Analyses
- Atterberg Limits
- Stabilometer (R-Value)
- Corrosion Studies

All testing was done in general accordance with applicable ASTM specifications. Details of the laboratory testing program and test results are presented in Appendix A.

SOIL CONDITIONS

The soil conditions at the site consist of hydraulic fill underlain by estuary deposits, which are in turn underlain by dense sands and gravels. Soil layering is fairly uniform and contiguous between exploration locations. Figures 2.1 and 2.2, Geologic Cross Sections, illustrate interpreted geologic conditions at the site in profile view.

The hydraulic fill consists primarily of sand and silty sand placed during marina construction and is not uniformly well compacted. Prior explorations at the site by other consultants indicated that some of the hydraulic fill contained debris, oil staining, and petroleum odors. The depth of the hydraulic fill encountered in our explorations varied from about 1 to 11 feet below the existing grade, (Elevation +1 foot to +2 feet – MSL datum).

The natural soils immediately underlying the hydraulic fill are recent estuary deposits extending to depths of about 40 feet below the ground surface or to about Elevation -26 feet to -37 feet. Based on the Standard Penetration Tests performed in our borings, the N-value of the granular soils varied from 6 to 29, which would classify the granular materials as varying from loose to dense. The N-value of the cohesive silts and clays varied from 1 to 7, which would classify the silts and clays as soft to medium stiff.

Dense to very dense granular soils lie below the estuary deposits and consist primarily of sands and gravels with some silts and silty sands extending to the 75-foot depth explored. Gravelly sands were encountered between 38 to 65 feet below ground surface or at Elevation -26 feet to -56 feet.

Groundwater was measured in all current explorations at depths ranging from about 4 to 14 feet below ground surface or between Elevations +1 to -3 feet. These groundwater levels are consistent with prior explorations at the site dating back to the 1970's. The groundwater levels fluctuate with the tides and have been reported at Elevations -4 feet to about +5 feet. The maximum fluctuation

occurs in close proximity to the sea wall, while very little change is noted near the west property boundary.

The corrosion studies indicate that the on-site soils are mildly to very corrosive to ferrous metals and negligibly to severe corrosive to portland cement concrete. The report of soil corrosivity study presented in Appendix A should be referred to for a discussion of the corrosion potential of the soils, and for potential mitigation measures.

GEOLOGY

GEOLOGIC SETTING

The site is located within the Los Angeles coastal plain, the westernmost portion of California's Los Angeles Basin Structural and Geomorphic province. The Los Angeles Basin is bounded by the Santa Monica Mountains and Elysian Hills to the north, the Puente Hills to the east, the Palos Verdes Peninsula and Pacific Ocean on the west, and the Santa Ana Mountains and San Joaquin Hills to the south. The basin is underlain by a deep structural depression that has been filled with both marine and continental sedimentary deposits. The sediments are underlain by a basement complex of crystalline igneous and metamorphic composition.

GEOLOGIC MATERIALS

The marina is composed of hydraulic fill that overlies coastal deposits consisting of bay mud and beach and lagoonal deposits. The coastal deposits are underlain by alluvium from Ballona Creek and the ancestral Los Angeles River. Pleistocene deposits beneath the alluvium consist of San Pedro Formation units. Figures 2.1 and 2.2, Geologic Cross Sections, have been prepared to illustrate the relation of the subsurface materials to the proposed construction. Areal distribution of geologic units in the site vicinity are depicted on Figure 3, Regional Geologic Map.

Hydraulic fill soils varying from 1 to 11 feet in thickness were encountered in our borings. Previous borings at the site encountered up to 16 feet of hydraulic fill. The fill soils consist primarily of sand and silty sand. The fill is a result of the prior marina construction.

The natural soils beneath the fill are recent coastal estuary deposits consisting predominantly of soft compressible silts and clays and loose sands and silty sands to depths of about 40 to 50 feet underlain by dense sands and gravels to at least 100 feet below the existing surface.

GROUNDWATER

Groundwater was measured in all of the previous explorations at depths ranging from 5 feet to 12 feet. The groundwater levels fluctuate with tides and have been reported at elevations ranging from about Elevation –5 to about Elevation +5 (MSL) near the sea wall.

GEOLOGIC HAZARDS

Faults

The numerous faults in southern California are categorized as active, potentially active, and inactive. Active faults are generally those faults that have displaced rock units during the Holocene Epoch (i.e. the last 11,000 years). Potentially active faults have demonstrated displacement within the Pleistocene Epoch (i.e. the last 1.6 million years) but do not displace Holocene Strata. Inactive faults do not exhibit displacement younger than 1.6 million years before the present.

The closest active fault to the site is the Palos Verdes fault. The Palos Verdes fault has been mapped approximately 4 miles southwest of the site. Vertical separations up to about 6,000 feet occur across the fault at depth. Strike-slip movement is indicated by the configuration of the basement surface and lithologic changes in the Tertiary age rocks across the fault. A series of marine terraces in the Palos Verdes Hills were uplifted as a result of movement along the fault during the Pleistocene Epoch. Geophysical data indicate offset at the base of offshore Holocene age deposits. However, no historic large magnitude earthquakes are associated with this fault.

The Newport-Inglewood fault zone, is located about 6 miles northeast of the site. Other nearby active faults are the Santa Monica-Hollywood fault, the Raymond fault, and the Whittier fault, located 6 miles north, 20 miles northeast, and 24 miles east of the site, respectively. The San Andreas fault zone is located about 44 miles northeast of the site.

The closest potentially active fault to the site is the Charnock fault, located about 2.4 miles northeast. Other nearby, potentially active faults include the Coyote Pass fault, and the Norwalk fault, located 13 miles east and 22 miles southeast of the site, respectively.

The site is not located within a currently established Alquist-Priolo Earthquake Fault Zone for surface fault rupture hazards. The closest Alquist-Priolo Earthquake Fault Zone, established for the Newport-Inglewood fault, is located 5.8 miles to the northeast. Faults, or fault-related features, were not observed during our site reconnaissance. Figure 4, Regional Seismicity Map, is presented to illustrate the major active and potentially active faults and historic epicenters in the southern California area. Active or potentially active faults with the potential for surface fault rupture are not known to be located directly beneath the site. Therefore, the potential for surface rupture hazard due to fault plane displacement propagating to the surface at the site during the design life of the proposed hotel is considered low.

Seismicity

Several earthquakes of moderate to large magnitude have occurred in the southern California area within the last 60 years. A list of these earthquakes is included in Table 1, List of Historic Earthquakes.

Table 1, List of Historic Earthquakes

Earthquake	Date of Earthquake	Magnitude	Distance to Epicenter (miles)	Direction to Epicenter
Long Beach	March 11, 1933	6.4	37	South-Southeast
San Fernando	February 9, 1971	6.6	31	North-Northwest
Whittier Narrows	October 1, 1987	5.9	21	East
Sierra Madre	June 28, 1991	5.4	32	Northeast
Big Bear	June 28, 1992	6.4	92	East
Landers	June 28, 1992	7.3	113	East
Northridge	January 17, 1994	6.7	17	Northwest

The site is not exposed to a greater than normal seismic risk than other areas of southern California. However, based on the active and potentially active faults in the region, the site will likely be subjected to significant ground shaking in the event of an earthquake. This hazard is common to southern California and can be mitigated if the buildings are designed and constructed in conformance with current building codes and sound engineering practices.

Slope Stability

The near-level topography at the site precludes stability problems related to cut or fill slopes. However, there is a potential for slope failure due to lateral spreading resulting from liquefaction. This is discussed in a following section. There are no known landslides near the site, nor is the site in the path of any known or potential landslides.

Excavation of one level of subterranean parking extending about 10 to 12 feet below grade is planned. The excavation will expose hydraulic fill and natural coastal and alluvial deposits. These deposits are probably horizontally stratified and lack well-defined planar features or discontinuities (such as bedding or joints) that would act as planes of weakness.

Liquefaction and Seismically-Induced Settlement

According to the California Division of Mines and Geology Seismic Hazard Map for the Venice Quadrangle, the site is located within the limits of a potential liquefaction hazard zone. The liquefaction hazard is addressed in a following section, Liquefaction Potential.

Tsunamis, Inundation, Seiches, and Flooding

According to the Los Angeles County Seismic Safety Element (1990), the site is located in a tsunamis hazard zone. According to recently prepared tsunami related inundation maps by the State of California, the maximum potential runup height for the Marina del Rey area could be up to 15 feet. Figure 5, Tsunami Inundation Map, illustrates the predicted areal extent of possible inundation as a result of a tsunami in this region.

Subsidence

The site is not located within an area of known subsidence associated with fluid withdrawal (groundwater or petroleum), peat oxidation, or hydrocompaction. The site is located within the Playa Del Rey Oil Field. Subsidence associated with petroleum production has been identified in some of the oil fields in the Los Angeles Basin; however, subsidence has not been identified in the Playa Del Rey Oil Field. Consequently, the potential for future subsidence within the oil field is considered low.

One oil well is located within the site limits and several known wells are located within 800 feet of the site. According to the State of California, Division of Oil and Gas (CDOG), these wells have been plugged and abandoned. However, these wells and others, if encountered during construction, may need to be properly abandoned in accordance with the current requirements of the CDOG.

SUMMARY OF GEOLOGIC FINDINGS

Based on the available geologic data, known active or potentially active faults with the potential for surface fault rupture are not located beneath the site. Accordingly, the potential for surface rupture at the site due to faulting during the design life of the proposed hotel development is considered low. Although the site could be subjected to strong ground shaking in the event of an earthquake, this hazard is common in southern California, and the effects of ground shaking can be mitigated if the buildings are designed and constructed in conformance with current building codes and engineering practices.

The site is relatively level, and the absence of nearby slopes precludes conventional slope stability hazards. Liquefaction and lateral spreading potential are discussed in a later section of this report. The County of Los Angeles has included the site within the limits of a Tsunami Inundation Zone and the site could be subjected to the effects of a seismic sea wave.

LIQUEFACTION POTENTIAL

ANALYSES

Liquefaction potential is greatest where the groundwater level is shallow, and loose sands or silts occur within a depth of about 50 feet or less. In general, liquefaction potential decreases as grain size and clay and gravel content increase. As ground acceleration and shaking duration increase during an earthquake, liquefaction potential increases.

Liquefaction potential of the soils at the project location was evaluated based on the methodologies discussed by Youd and Idriss (1997) and Youd et. al. (2001), and addressed in the *Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California*. Specifically, the Standard Penetration Test (SPT) blowcounts, CPT tip resistance, and laboratory results of the soil grain size and Atterberg Limit states were used to assess the liquefaction potential. In soil layers that were silt and clayey silt, consideration was given to clay fraction, liquid limit, and plasticity index when evaluating the liquefaction potential as recommended by Seed et. al. (2003). Non-standard blowcounts were converted to approximately equivalent SPT blowcounts in the evaluation.

The liquefaction potential was determined for a ground motion with a 10% probability of exceedence in 50 years, designated the design basis earthquake. This ground motion corresponds to a predominant earthquake magnitude of 7.1, site to source distance of 6.5 kilometers, and a peak ground acceleration (PGA) of 0.46g, as determined by the California Division of Mines and Geology Seismic Hazard Zone Report 036, Seismic Hazard Evaluation of the Venice Quadrangle for Alluvium Conditions. However, it was brought to our attention by the County of Los Angeles Department of Public Works that the Los Angeles County Planning and Zoning Ordinance and the Marina Del Rey Specific Plan (Section 22.46.1180, Item 4) requires that "all new development over three stories in height shall be designed to withstand a seismic event with a ground acceleration of no less than 0.5g." Therefore, the PGA used in the liquefaction evaluation was set equal to 0.5g.

SUBSURFACE CONDITIONS

Groundwater Level

Groundwater depth for the liquefaction evaluation was established based on current and past water level records at the site (dating as far back as the early 1970s) as well as historic high groundwater level contours in the area. The groundwater levels are known to fluctuate with the tides with the largest variation occurring close to the sea wall with very little change near the west site boundary. Current groundwater levels measured at the site indicate groundwater in the range of about 4 to 14 feet below existing grade or at Elevation +1 to -3 feet (MSL). Published groundwater contours for the area indicate historic high water levels at about 5 feet below ground surface. Assuming the existing ground surface averages about +10 feet, then historic highs are about +5 feet, which is about 4 to 8 feet higher than current levels. Groundwater depth was assumed at Elevation +5 feet in the liquefaction evaluation.

Soil Conditions

According to our analysis, potentially liquefiable silty sand to sand layers exist within the upper 75 feet below the ground surface. In general, the hydraulic fill has the soil characteristics to potentially liquefy; however the proposed basement excavation (planned to Elevation +1 foot) will automatically remove these soils. Below this level, two potentially liquefiable sandy layers exist within the estuary deposits. The first layer is within a zone about 10 to 25 feet below ground surface (approximately Elevation 0 to -15 feet). The thickness of this zone varies among the explorations, but is generally about 6 to 10 feet thick and fairly contiguous between exploration locations. The second layer is within a zone about 28 to 40 feet below ground surface (approximately Elevation -20 to -32 feet). The thickness of this zone also varies among the explorations but is generally about 2 to 10 feet thick and is fairly contiguous between exploration locations.

Below the estuary deposits, a dense to very dense silty and gravelly sand layer exists that extends from about 40 to 65 feet below ground surface (Elevation -30 to -55 feet). This layer exhibits a low potential for liquefaction. From about 65 feet below ground surface to the maximum depth

explored of 75 feet a dense sand and silty sand layer was encountered, which in some explorations showed a moderate potential for liquefaction in the 65- to 68-foot range.

CONCLUSIONS

Seismic Settlement

Total seismic settlements (both saturated and unsaturated soils) were estimated from each exploration and are shown in Table 2, Estimated Seismic Settlement due to Liquefaction. Generally, the total settlements are in the range of 4 to 7 inches, with one exploration (Boring 5) indicating as much as 11 inches. However, given the consistency in computed settlements in five of the six explorations, and the consistency in computed settlements using SPT and CPT data, it is our opinion that the total seismic settlements at the site are more in line with 4 to 7 inches. Given the contiguous nature of the subsurface soils, we would expect differential settlements to be less than about 2 inches. Liquefaction settlement calculations are presented in Appendix C.

Table 2, Estimated Seismic Settlement due to Liquefaction

Exploration	Estimated Seismic Settlement
Boring 1	4 inches
Boring 2	7 inches
Boring 3	6 inches
Boring 4	4 inches
Boring 5	11 inches
CPT-1	4 inches
CPT-2	6 inches

In summary, two distinct potentially liquefiable layers exist within the upper 40 feet below existing grade. These soils are located in the estuary deposits below the hydraulic fill, but above the dense gravelly sand layer. The thickness of the first layer varies between about 6 to 10 feet, and the thickness of the second layer varies between about 2 to 10 feet. The total seismic settlements were estimated to be on the order of 4 to 7 inches and should be considered in the design of the foundation system. Another lower potentially liquefiable layer exists beneath the gravelly sand layer at a depth of about 65 to 68 feet below existing grade. However, this layer was not identifiable in all explorations and is relatively thin. Given its depth below ground surface coupled

with the foundation recommendations discussed subsequently, we feel it would have negligible impact on the supporting capacity of the soils and foundation system.

Lateral Spreading

Lateral spreading is a liquefaction induced lateral displacement that often occurs for sites on sloping ground or near a free-face. Past earthquakes have shown that under adverse conditions, lateral spreading can produce large lateral displacements that can be damaging to foundations. Because of the complex nature of liquefaction-induced lateral spreading, estimation of the magnitude of potential lateral displacements at a site is very difficult. Statistically derived empirical equations utilizing back-analyses of lateral spreading case histories are often used to provide an order of magnitude of expected lateral displacements. Liquefaction-induced lateral spreading of the soils at the project location was evaluated based on the methodology discussed by Youd et. al. (2002). In the analysis, free-face conditions were assumed because of the proximity of the site to the marina seawall. Further, the expected ground motions at the site, results of the grain size characteristics of the saturated granular soils, as well as the results of the liquefaction evaluation were considered in the analysis. The perpendicular distance from the marina seawall to the middle of the site was used in the analysis. The seawall was assumed to provide no lateral restraint against lateral spread movements. According to our analysis, there is potential for large liquefaction induced lateral displacements on the order of several feet toward the marina seawall.

RECOMMENDATIONS

GENERAL

The existing fill and estuary deposits are not suitable for support of the project and foundations should extend through these weak, compressible deposits and into the underlying dense sand and gravel. Deep foundations will be required. Driven piles could be used, but may not be practical because of the noise associated with the pile driving. Auger-cast piles would be a reasonable and practical alternative.

To resist the effects of liquefaction, downdrag loads and potential lateral spreading forces would need to be added to the design loads on the piles, the floor slabs would need to be structurally supported and the lateral resistance of the foundation system would be impaired. Batter piles could be used by the structure to resist the high lateral forces resulting from the lateral spreading, but would not protect adjacent hardscape improvements. In our opinion, the lateral spreading will need to be mitigated. The mitigation could consist of replacement of the seawall to resist the lateral spreading, or ground improvement to mitigate both the liquefaction and lateral spreading.

The existing seawall could be replaced with a suitable structure designed to resist the effects of liquefaction and the forces associated with the lateral spreading. The new seawall could be constructed at the same location as the existing seawall, which would require cooperation with the County. Alternately, the new seawall could be constructed entirely within the project limits, at the east property line.

The seawall would need to be supported on pile foundations extending through the liquefiable soils and be designed to support liquefiable soils to depths below the dredged level of the adjacent basin. The replacement seawall would confine the soils within the site, but the possibility of liquefaction and the design requirements for the structure would still be present.

The possibility of liquefaction and the resulting lateral spreading could be mitigated with an in-situ ground improvement process. The ground improvement would reduce the liquefaction possibility permitting the use of higher pile capacities and permitting floor slabs to be supported on grade. The ground improvement would also protect the hardscape improvements.

The ground improvement process could include densification of the susceptible soils using a vibro-replacement method. If the ground improvement included the use of stone columns, the stone columns could be integrated into the foundation design of the conference center and underground parking. The auger-cast piles would still be required beneath the hotel/timeshare tower.

We recommend that the liquefaction and lateral spreading be mitigated by ground improvement techniques, including stone columns. The ground improvement would eliminate the liquefaction and lateral spreading risk for the project. The hotel/timeshare tower should be supported on deep

foundations into the underlying dense sand and gravel. The conference center may be supported on a mat foundation. Recommendations for these alternatives are included in the following sections.

Groundwater was measured in our borings at depths of 4 to 18 feet, corresponding to Elevation +1 to –3. The groundwater levels fluctuate with tides and have been reported at elevations ranging from mean sea level to about Elevation +5 near the sea wall. The lower level floor slabs should either be underlain by a subdrain or be designed to resist the hydrostatic pressure of groundwater which could reach as high as Elevation +5.

There are several existing pile foundations on the site. Where the foundations are in the building area, they should be cut off at least five feet below the bottom of the proposed mat or the proposed pile caps.

GROUND IMPROVEMENT

The excavation for the project's subterranean level will essentially extend through the existing hydraulic fill and into the estuary deposits over nearly all of the site. Based on some of the Crandall borings, a shallow amount of hydraulic fill may remain on portions of the site. The estuary deposits consist of loose to dense granular soils with N-values of 6 to 29 and soft to medium stiff silts and clays with N-values of 1 to 8. Our analyses indicate that if the granular deposits are densified to an N-value of 15, the lateral spreading would be mitigated and if densified to an N-value of 20, the risk of settlement due to liquefaction would be significantly lowered.

We recommend a program of in-situ densification to improve the density of the granular estuary deposits to a minimum N-value of 20. The densification could be accomplished using stone-columns, where a vibrating probe is inserted into the ground and the densified soils are replaced with gravel. We anticipate that the probes will need to be spaced between 6 and 12 feet on centers to achieve the required minimum N-values. The densification should be performed throughout the estuary deposits to the surface of the dense sand and gravel, which was encountered in the explorations between Elevation –25 to –37 or 26 to 38 feet below the lowest parking level.

The densification should be performed within the entire area of the tower and conference center and 15 feet beyond the building footprints in plan. If there is not sufficient space to permit the densification beyond the buildings, then we recommend that the soils within the building area be confined using a soil-cement column, where the on-site soils are mixed in place with cement to create a confinement around the site's perimeter. The soil-cement columns could be located on the property line.

The densification will need to be evaluated by a test program using cone penetration tests (CPT). We recommend that the ground improvement program be initiated on a test area about 50 feet square. After the initial ground improvement effort, the results should be evaluation using a CPT and the spacing of the probes be adjusted.

TOWER FOUNDATIONS – PILE FOUNDATIONS

General

Foundations for the hotel/timeshare tower should extend through the existing fill and estuary deposits and into the underlying dense sand and gravel. Driven piles could be used, but the noise associated with pile driving may be a problem in this residential neighborhood. Auger-cast piles could be used as an option to the driven piles.

Vertical Capacities

The vertical capacities of 12- and 14-inch square driven precast piles are presented on Figure 6.1 Driven Pile Capacities. The capacities of 18-, 24- and 30-inch diameter auger-cast concrete piles are presented on Figure 6.2, Auger-Cast-Pile Capacities. The capacities of other size piles may be assumed to be proportional to the pile diameter. The capacities are presented for penetration into the dense sand and gravel, which was encountered at depths of 38 to 50 feet below existing grade (27 to 40 feet below the lowest parking level). The presented capacities are for dead plus live loads; a one-third increase in the capacities may be used for wind or seismic loads.

Settlement

The settlement of the proposed tower supported on deep foundations into the underlying dense sand and gravel will be on the order of ½ inch.

Lateral Resistance

Lateral loads may be resisted by the piles and by the passive resistance of the soils. We have determined the lateral capacity of a 24-inch diameter, auger-cast pile, assuming a ¼-inch deflection and for piles partially fixed against rotation in the pile caps and for a completely fixed condition. The allowable lateral resistance for a 24-inch diameter auger-cast pile are presented in Table 3, Lateral Pile Capacities.

Table 3, Lateral Pile Capacities

Pile Type	Free-Head	Fixed-Head
12-inch Square Driven Concrete Pile	6 kips	15 kips
24-inch Diameter Auger Cast Pile	12 kips	30 kips

The maximum bending moment in the piles may be determined by multiplying the lateral load by a lever arm of five feet. It may be assumed that the maximum bending moment will occur near the top of the pile and will decrease to zero at a depth of 25 feet.

The passive resistance of the natural soils or compacted backfill may be assumed to be equal to 250 pounds per square foot per foot of depth. A one-third increase in the passive value may be used for wind or seismic loads, but since the lateral pile capacities are based on deflection, no increase in the pile capacities is available.

Driven Pile Installation

Hard driving is anticipated in penetrating sandy layers of the estuary deposits and in the dense sand and gravel; predrilling should be anticipated at the pile locations. The predrilling should not extend closer than 5 feet to the tip of the pile.

An indicator pile program will be needed prior to proceeding with pile installation and casting of the production piles. For such an indicator pile program we recommend installing at least five indicator piles. The indicator piles may be production piles driven in their final locations. The indicator pile program should begin adjacent to one of our exploration borings. We should be consulted during the indicator pile program so any variations in the soil conditions and modifications in the program can be addressed.

Because of potential variation in pile lengths, we recommend that the indicator piles be cast at least 10 feet longer than the anticipated lengths. The required driving resistance will depend on the design pile capacity and the energy of the pile driving hammer. The driving resistance for a 12- or 14-inch square pile with a design capacity of 240 kips is presented in Table 4, Required Pile Driving Resistance.

Table 4, Required Pile Driving Resistance

Driving Energy (ft-lbs./blow)	30,000	50,000	70,000
Driving Resistance (blows/ft)	53	27	18

The required driving resistance should be obtained for the last foot of driving at the design length. If the desired driving resistance is not obtained at design length, the piles should be lengthened until the desired resistance is obtained. If the desired resistance is not obtained within an additional five feet of driving, it may be necessary to perform a pile load test to further evaluate the pile capacities.

Auger-Cast-Pile Installation

The method of constructing auger-cast piles can vary by contractor. The auger-cast piles are typically installed by drilling a continuous-flight auger into the ground to the desired design depth and placing the concrete by pumping through the auger tip as the auger is withdrawn. A single reinforcing bar can be installed with the auger as it is drilled into position, or a reinforcing cage can be installed through the concrete immediately after concrete placement.

Uncertainties involved with the installation of auger-cast piles can include loss of integrity of the concrete if the auger is withdrawn faster than the placement of the concrete and inconsistent contact pressure during concrete placement caused by variations in the pumping pressure. The pile installation contractor should be selected based on their experience in the installation of auger-cast piles. We should review their procedures prior to awarding the contract and we recommend that load tests be performed to verify the actual capacity of the piles.

We recommend that integrity testing be performed to verify the continuity of the completed piles. The integrity tests shall be performed in accordance with the ASTM D5822 test method.

CONFERENCE CENTER-MAT FOUNDATION

Bearing Value

A mat foundation established on the densified soils and carried at least 2 feet below the adjacent floor level can be designed to impose an average net dead-plus-live load pressure of 3,000 pounds per square foot. A one-third increase in the bearing value can be used for wind or seismic loads. The recommended bearing value is a net value, and the weight of concrete in the footings can be taken as 50 pounds per cubic foot; the weight of soil backfill can be neglected when determining the downward loads.

Footings for minor structures (loading dock walls, minor retaining walls, and free-standing walls) that are structurally separate from the structure can be designed to impose a net dead-plus-live load pressure of 1,000 pounds per square foot at a depth of 1½ feet below the lowest adjacent grade. Such footings can be established in either properly compacted fill soils or undisturbed natural soils.

Modulus of Subgrade Reaction

A vertical unit modulus of subgrade reaction of 150 pounds per cubic inch may be used for design of a mat of interconnected foundations. The 150 pci value is a unit value for use with a one-foot square foundation. For design of larger foundations with width equal to B, the following equation should be used:

$$K_R = K \left[\frac{B+1}{2B} \right]^2$$

where:

K = Unit Subgrade Modulus (in pounds per cubic inch)
K_R = Reduced Subgrade Modulus (in pounds per cubic inch)
B = Foundation Width (in feet)

Settlement

We estimate the settlement of the conference center and parking structure supported on a mat foundation in the manner recommended, will be on the order of one inch. Differential settlement between adjacent columns on the mat is expected to be about ¼ inch or less. The differential settlement between the hotel/timeshare tower and the conference center mat will need to be evaluated by the structural engineer to determine if a structural separation will be needed between the hotel/timeshare tower and the conference center. We can provide additional settlement analyses if needed.

Lateral Resistance

Lateral loads can be resisted by soil friction and by the passive resistance of the soils. A coefficient of friction of 0.4 can be used between the foundations and the supporting soils. The passive resistance of natural soils or properly compacted fill soils can be assumed to be equal to the pressure developed by a fluid with a density of 150 pounds per cubic foot. A one-third increase in the passive value can be used for wind or seismic loads. The frictional resistance and the passive resistance of the soils can be combined without reduction in determining the total lateral resistance.

GROUND MOTION STUDIES

Deterministic Spectra

1997 Uniform Building Code (UBC)

The structure can be designed to resist earthquake forces in accordance with the 1997 Uniform Building Code (UBC). Based on Figure 16-2 of the 1997 UBC, the site is located within Seismic Zone 4. We determined the shear wave velocity of the soils within our CPT explorations. The shear wave velocity results presented in Appendix A yield an average velocity of 700 feet per second. LeRoy Crandall and Associates also conducted a downhole seismic survey as part of their 1982 investigation and determined that the upper 100 feet of the soils have an average shear wave velocity of about 740 feet per second. Consequently, the Soil Profile Type, as defined in Section 1636 and shown in Table 16-J of the 1997 UBC, may be assumed to be Type S_D, Stiff Soil Profile.

The closest active fault to the site is the Palos Verdes fault, a Type B seismic source, as shown on Map M-33 of the International Conference of Building Officials publication dated February 1998, "Maps of Known Active Fault Near Source Zones in California and Adjacent Portions of Nevada" to be used in conjunction with the 1997 UBC. The site is within 7 kilometers of the Palos Verdes fault.

The near-source factors, N_a and N_v, should be taken as 1.0 and 1.1, respectively, according to Tables 16-S and 16-T from the 1997 UBC. The seismic coefficients, C_a and C_v, may be determined for these near-source factors and for the Soil Profile Type S_D.

2003 International Building Code (IBC)

Alternatively, the structure can be designed to resist earthquake forces following the 2003 International Building Code (IBC). The Soil Profile Type, as defined in Section 1615.1.5 and Table 1615.1.1 of the 2003 IBC, may be assumed to be Site Class D, Stiff Soil Profile.

The mapped maximum considered earthquake spectral response accelerations, S_s and S_1, should be taken as 1.75 and 0.75, respectively, according to Figures 1615(3) and 1615(4) from the 2003 IBC. The site coefficients, F_a and F_v, may be determined for these near-source factors and for the Site Class D.

Peak Ground Accelerations and Probabilistic Response Spectra

Peak ground accelerations and site-specific response spectra were developed for three earthquake levels using the computer program FRISKSP (Blake, 2000). The three levels used were those representing ground motions having a 10% probability of exceedence during a 50-year time period (the Design Basis Earthquake or DBE), a 10% probability of exceedence in a 100-year time period (the Upper Bound Earthquake or UBE), and a 2% probability of exceedence in a 50-year time period (the Maximum Considered Earthquake or MCE). The postulated earthquakes correspond to return periods of 475, 950 and 2,475 years, respectively.

The ground accelerations were estimated using a probabilistic method of analysis and the relationships developed by Boore, et al. (1997), Campbell (1997), Abrahamson and Silva (1997), and Sadigh, et al. (1997). The response spectra for the Design Basis, Upper Bound, and Maximum Considered Earthquake levels are presented on Figures 7.1 through 7.3 for structural damping values of ½% and 5%.

The response spectra are also presented in tabular form in Table 5, Horizontal Ground Motion, Pseudo Spectral Velocity and in Table 6, Horizontal Ground Motion, Pseudo Spectral Acceleration. An average shear wave velocity of 200 meters per second (656 feet per second) over the upper 30 meters was used in the attenuation relationships by Boore, et al.

Table 5, Horizontal Ground Motion, Pseudo Spectral Velocity (ft/sec)

Period (sec)	5% Damping			½% Damping		
	DBE	UBE	MCE	DBE	UBE	MCE
	10% in 50 years	10% in 100 years	2% in 50 years	10% in 50 years	10% in 100 years	2% in 50 years
0.01	0.03	0.04	0.04	0.03	0.04	0.04
0.03	0.09	0.11	0.11	0.09	0.11	0.11
0.10	0.45	0.55	0.45	0.70	0.87	0.71
0.20	1.33	1.64	0.73	2.09	2.58	1.15
0.30	2.17	2.69	1.96	3.41	4.23	3.08
0.40	2.78	3.47	2.92	4.37	5.46	4.60
0.50	3.19	4.01	4.14	5.01	6.31	6.51
0.75	3.61	4.58	5.04	5.67	7.20	7.92
1.00	3.75	4.79	5.55	5.89	7.53	8.72
1.50	3.93	5.05	6.00	6.19	7.94	9.43
2.00	4.06	5.21	5.88	6.38	8.19	9.24

Table 6, Horizontal Ground Motion, Pseudo Spectral Acceleration (g)

Period (sec)	5% Damping			½% Damping		
	DBE	UBE	MCE	DBE	UBE	MCE
	10% in 50 years	10% in 100 years	2% in 50 years	10% in 50 years	10% in 100 years	2% in 50 years
0.01	0.58	0.71	0.75	0.58	0.71	0.75
0.03	0.58	0.71	0.73	0.58	0.71	0.73
0.10	0.87	1.08	1.18	1.52	1.87	2.06
0.20	1.30	1.60	1.43	2.26	2.78	2.48
0.30	1.41	1.75	1.91	2.46	3.05	3.32
0.40	1.36	1.69	1.90	2.36	2.95	3.31
0.50	1.24	1.57	1.62	2.16	2.72	2.81
0.75	0.94	1.19	1.31	1.63	2.07	2.28
1.00	0.73	0.93	1.08	1.27	1.62	1.88
1.50	0.51	0.66	0.78	0.89	1.14	1.36
2.00	0.40	0.51	0.57	0.69	0.88	1.00

HYDROSTATIC DESIGN

Groundwater was measured in our borings as high as Elevation +1 feet and in borings by others as high as Elevation +5. For design purposes, we recommend that the groundwater level be assumed at Elevation +5 (MSL). If a subdrain is not provided beneath subterranean slabs on grade and behind basement walls, the floor slabs and walls extending below groundwater should be designed to resist the resulting hydrostatic pressure. The pressure would be equal to that developed by a fluid with a density of 62 pounds per cubic foot. The basement walls and floor slabs should be thoroughly waterproofed and the waterproofing behind the basement walls should extend to the adjacent ground surface.

FLOOR SLAB SUPPORT

If the subgrade is prepared as recommended in the following section on grading, the building floor slab can be supported on grade.

Construction activities and exposure to the environment can cause deterioration of the prepared subgrade. Therefore, we recommend that our field representative observe the condition of the final subgrade soils immediately prior to slab-on-grade construction, and, if necessary, perform further density and moisture content tests to determine the suitability of the final prepared subgrade.

We recommend that the lower level floor slab be waterproofed. If a subdrain is installed, a capillary break may be needed. The capillary break should consist of either an impermeable membrane or a 4-inch-thick layer of gravel. A 2-inch-thick layer of sand should be placed between the subgrade and the membrane to decrease the possibility of damage to the membrane. Our recommended gradation for the gravel is presented in Table 7, Capillary Break.

Table 7, Capillary Break

Sieve Size	Percent Passing
3/4"	90 - 100
No. 4	0 - 10
No. 100	0 - 3

A low-slump concrete should be used to minimize possible curling of the slab. A 2-inch-thick layer of coarse sand can be placed over the impermeable membrane to reduce slab curling. If this sand bedding is used, care should be taken during the placement of the concrete to prevent displacement of the sand. The concrete slab should be allowed to cure properly before placing vinyl or other moisture-sensitive floor covering.

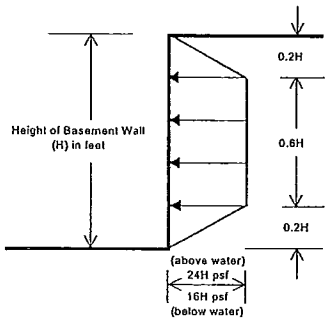
RETAINING WALLS

Lateral Earth Pressure

For design of cantilevered retaining walls, where the surface of the backfill is level, it can be assumed that drained soils will exert a lateral pressure equal to that developed by a fluid with a density of 35 pounds per cubic foot.

For design of braced basement walls above groundwater level, where the surface of the backfill is level, it should be assumed that the soils will exert a trapezoidal distribution of lateral earth pressure where the maximum pressure is equal to 24H in pounds per cubic foot, where H is the height of the basement wall in feet. Below groundwater level, a hydrostatic pressure of 62 pounds per cubic foot should be added to a trapezoidal active pressures of 16H. The lower (16H) active pressure value is because of buoyancy of the soils below groundwater level.

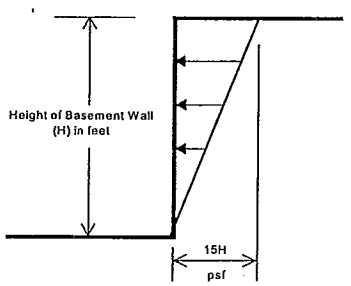
The recommended active pressure distribution against braced walls is shown in the following sketch. The hydrostatic pressure due to groundwater must be added below groundwater.



In addition to the recommended earth pressure, retaining walls adjacent to areas subject to vehicular traffic should be designed to resist a uniform lateral pressure of 100 pounds per square foot, acting as a result of an assumed 300 pounds per square foot surcharge behind the walls due to normal vehicular traffic. If the traffic is kept back at least 10 feet from the walls, the traffic surcharge can be neglected.

Seismic Lateral Earth Pressure

In addition to the above-mentioned lateral earth pressures, basement walls should be designed to support a seismic active pressure. The recommended seismic active pressure distribution on the basement walls is shown in the following diagram with the maximum pressure equal to 15H pounds per square foot, where H is the wall height in feet.



Drainage

Retaining walls should be designed to resist hydrostatic pressures or be provided with a drain pipe or weepholes. The drain could consist of a 4-inch-diameter perforated pipe placed with perforations down at the base of the wall. The pipe should be sloped at least 2 inches in 100 feet and surrounded

by filter gravel. The filter gravel should meet the requirements of Class 2 Permeable Material as defined in the current State of California, Department of Transportation, Standard Specifications.

If Class 2 Permeable Material is not available, ¾-inch crushed rock or gravel separated from the on-site soils by an appropriate filter fabric can be used. The crushed rock or gravel should have less than 5% passing a No. 200 sieve.

PAVING

To provide support for paving, the subgrade soils should be prepared as recommended in the following section on grading. Compaction of the subgrade, including trench backfills, to at least 90%, and achieving a firm, hard, and unyielding surface will be important for paving support. The preparation of the paving area subgrade should be done immediately prior to placement of the base course. Proper drainage of the paved areas should be provided since this will reduce moisture infiltration into the subgrade and increase the life of the paving.

To provide data for design of asphalt paving, the R-value of a sample of the upper soils was determined. The test results, which indicate an R-value of 72, are presented in Appendix A.

The required paving and base thicknesses will depend on the expected wheel loads and volume of traffic (Traffic Index or TI). Assuming that the paving subgrade will consist of the on-site or comparable soils, with an R-value of at least 50 and compacted to at least 90%, the minimum recommended paving thicknesses are presented in Table 8, Recommended Paving Thicknesses.

Table 8, Recommended Paving Thicknesses

Traffic Use	Traffic Index	Asphalt Paving	Base Course
Auto Parking	5.0	3 inches	4 inches
Delivery	8.0	5 inches	5 inches

We can determine the recommended paving and base course thicknesses for other Traffic Indices if required. Careful inspection is recommended to check that the recommended thicknesses or greater are achieved, and that proper construction procedures are followed.

The base course should conform to requirements of Section 26 of State of California Department of Transportation Standard Specifications (Caltrans), latest edition, or meet the specifications for untreated base as defined in Section 200-2 of the latest edition of the Standard Specifications for Public Works Construction (Green Book). The base course should be compacted to at least 95%.

HYDRAULIC ELEVATORS

Hydraulic elevators are anticipated within portions of the buildings. Where hydraulic elevators are installed within building areas by drilling a shaft and inserting a elevator casing in the drilled shaft, the annular space between the drilled excavation and the casing will need to be properly backfilled to prevent future caving and settlement of the ground surface. Drilling of the shafts will be difficult because of the groundwater and caving nature of the soils. We recommend that the annular space be backfilled by pumping a cement grout through a rigid pipe to the bottom of the excavation.

EXCAVATION AND SHORING

Excavations and Temporary Slopes

The sides of temporary excavations deeper than about 2 feet should be sloped back at 1:1 (horizontal to vertical) or shored for safety. Unshored excavations should not extend below a plane drawn at 1½:1 (horizontal to vertical) extending downward from adjacent existing footings.

Excavations should be observed by personnel of our firm so that any necessary modifications based on variations in the soil conditions can be made. All applicable safety requirements and regulations, including OSHA regulations, should be met.

Groundwater may be encountered above the bottom of the excavations and the site should be dewatered to provide a dry subgrade. The dewatering should be performed in advance of the excavation reaching subgrade. Because of stability concerns, water should not be allowed to flow out of the toe of any temporary excavations.

Shoring

General

Where there is not sufficient space for sloped embankments, shoring will be required. One method of shoring would consist of cantilevered steel soldier piles placed in drilled holes and backfilled with concrete. If suitably located and structurally adequate, the existing steel H-piles installed adjacent to the property lines may be used for shoring. At this time, the lengths of these piles are not known; this information should be determined before final design of shoring.

As discussed in the section on Ground Improvement, if there is not sufficient space to permit the densification beyond the buildings, then we recommend that the soils within the building area be confined using a soil-cement column, where the on-site soils are mixed in place with cement to create a confinement around the site's perimeter. The soil-cement columns could be located on the property line and used as the shoring. The columns would, of course, need to be designed to support the lateral earth loads and any surcharge.

The following information on the design and installation of the shoring is as complete as possible at this time. We can furnish any additional required data as the design progresses. Also, we suggest that our firm review the final shoring plans and specifications prior to bidding or negotiating with a shoring contractor.

Lateral Pressures

For design of cantilevered shoring, where the surface of the backfill is level, it can be assumed that drained soils will exert a lateral pressure equal to that developed by a fluid with a density of 30

pounds per cubic foot. This earth pressure is for drained soils and assumes that the site will be dewatered prior to excavation. In addition to the recommended earth pressure, the walls should be designed to resist any applicable surcharges due to storage or traffic loads.

Where a combination of sloped embankment and shoring is used, the pressure would be greater and must be determined for each combination. In addition to the recommended earth pressure, the upper 10 feet of shoring adjacent to the streets should be designed to resist a uniform lateral pressure of 100 pounds per square foot, acting as a result of an assumed 300 pounds per square foot surcharge behind the shoring due to normal street traffic. If the traffic is kept back at least 10 feet from the shoring, the traffic surcharge may be neected.

The shoring system adjacent to existing structures should be designed to support the lateral surcharge pressure from the existing structure foundations, or the foundations should be underpinned. We can determine the lateral surcharge pressure from the foundations when their locations and imposed loads are known.

Design of Soldier Piles

For the design of soldier piles spaced at least two diameters on centers, the allowable lateral bearing value (passive value) of the soils below the level of excavation in the bedrock may be assumed to be 300 pounds per square foot per foot of depth. To develop the full lateral value, provisions should be taken to assure firm contact between the soldier piles and the undisturbed materials. The concrete placed in the soldier pile excavations may be a lean-mix concrete. However, the concrete used in that portion of the soldier pile which is below the planned excavated level should be of sufficient strength to adequately transfer the imposed loads to the surrounding soils.

Lagging

Continuous lagging will be required between the soldier piles. The soldier piles and anchors should be designed for the full anticipated lateral pressure. However, the pressure on the lagging will be

less due to arching in the soils. We recommend that the lagging be designed for the recommended earth pressure but limited to a maximum value of 400 pounds per square foot.

GRADING

General

No new fill should be placed on the existing fill and all new fill should be compacted to at least 90% of the maximum dry density obtainable by the ASTM Designation D1557 method of compaction. All existing fill should be excavated and replaced as properly compacted fill. The preparation of the ground surface and the placing of all new fill should be performed under the observation and testing of our personnel.

Basement and Retaining Wall Backfill

All required basement and retaining wall backfill should be mechanically compacted in layers; flooding should not be permitted. Proper compaction of backfill will be necessary to minimize settlement of the backfill and to minimize settlement of overlying slabs and paving. The on-site soils can be used in the compacted backfill. The exterior grades should be sloped to drain away from the foundations to prevent ponding of water.

Some settlement of the backfill should be expected, and any utilities supported therein should be designed to accept differential settlement, particularly at the points of entry to the building. Also, provisions should be made for some settlement of concrete walks supported on backfill.

Material for Fill

The on-site soils, less any debris or organic matter, can be used in required fills. Cobbles larger than 4 inches in diameter should not be used in the fill. Any required import material should consist of relatively non-expansive soils with an expansion index of less than 35. The imported materials should contain sufficient fines (binder material) so as to be relatively impermeable and result in a stable subgrade when compacted. All proposed import materials should be approved by our personnel prior to being placed at the site.

GEOTECHNICAL OBSERVATION

The reworking of the upper soils and the compaction of all required fill should be observed and tested during placement by a representative of our firm. This representative should perform at least the following duties:

- Observe the ground improvement procedures and provide recommendations for procedure modification, as needed.
- Observe the installation of the shoring.
- Observe temporary cut slopes and provide recommendations for modification as needed.
- Observe the indicator pile installation and provide revised recommendations, as needed.
- Observe installation of the pile foundations.
- Observe the exposed subgrade in areas to receive fill to check that the desired excavation has been achieved and that suitable soils are exposed.
- Observe the fill for uniformity during placement.
- Test the compacted fill for field density and compaction to determine the percentage of compaction achieved during backfill placement.
- Observe and probe foundation materials to confirm that suitable bearing materials are present at the design foundation depths.

The governmental agencies having jurisdiction over the project should be notified prior to commencement of grading so that the necessary grading permits can be obtained and arrangements can be made for required inspection(s). The contractor should be familiar with the inspection requirements of the reviewing agencies and the content of this report.

BASIS FOR RECOMMENDATIONS

The recommendations provided in this report are based upon our understanding of the described project information and on our interpretation of the data collected during our subsurface explorations. We have made our recommendations based upon experience with similar subsurface conditions under similar loading conditions. The recommendations apply to the specific project discussed in this report; therefore, any change in the structure configuration, loads, location, or the site grades should be provided to us so that we can review our conclusions and recommendations and make any necessary modifications.

The recommendations provided in this report are also based upon the assumption that the necessary geotechnical observations and testing during construction will be performed by representatives of our firm. The field observation services are considered a continuation of the geotechnical investigation and essential to check that the actual soil conditions are as expected. This also provides for the procedure whereby the client can be advised of unexpected or changed conditions that would require modifications of our original recommendations. In addition, the presence of our representative at the site provides the client with an independent professional opinion regarding the geotechnically related construction procedures. If another firm is retained for the geotechnical observation services, our professional responsibility and liability would be limited to the extent that we would not be the geotechnical engineer of record.

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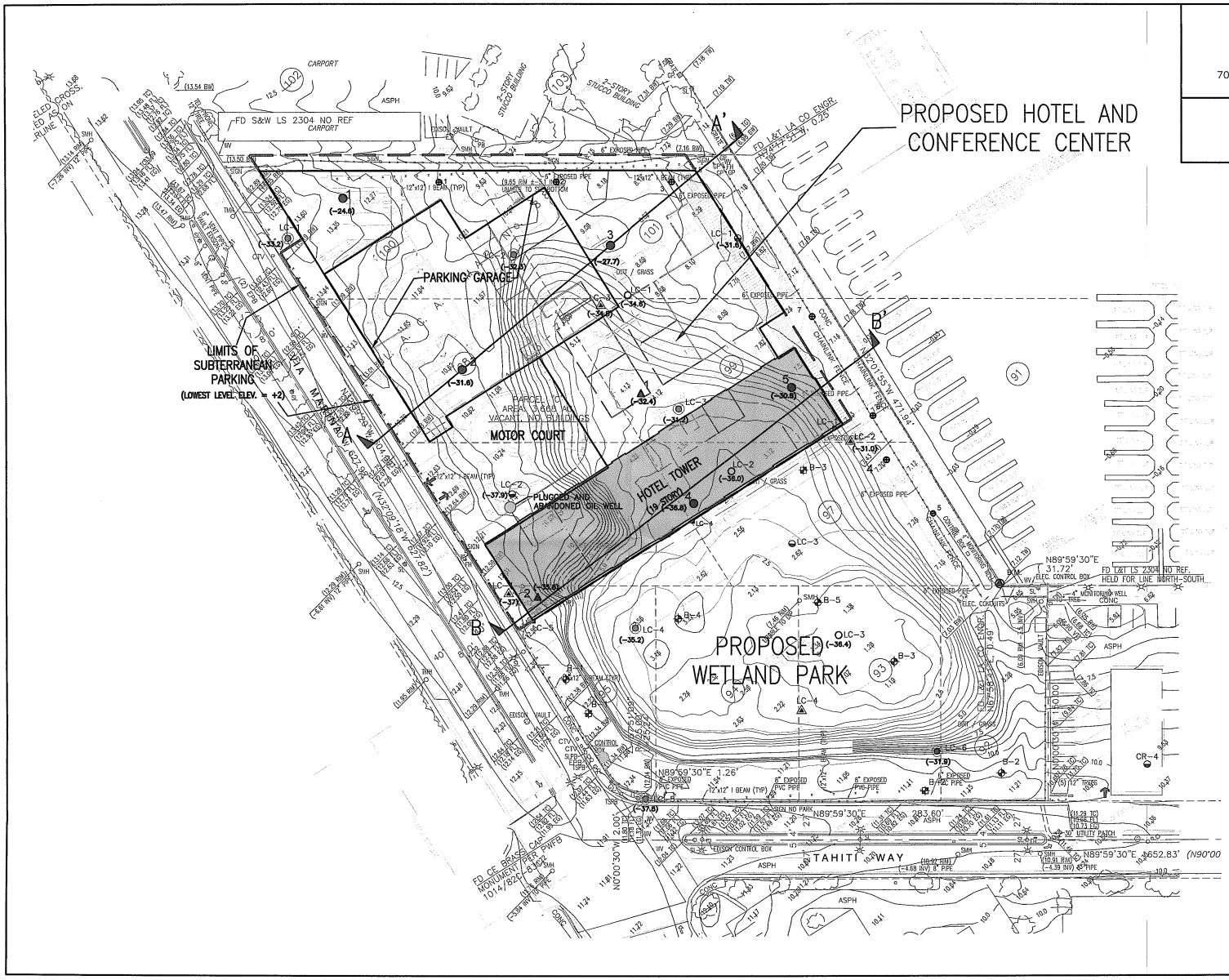

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PLOTPLAN
- FIGURE 1 -

JOB NO.	04-012.3
DRAWN BY: LL	CHECKED BY: VB
DATE:	OCTOBER 23, 2006

EXPLANATION

5 PROPOSED BORING LOCATION

2 PROPOSED CONE PENETROMETER LOCATION

EXPLORATION BY OTHERS

BORING LOCATIONS AND NUMBER:

LC-4 CRANDALL 1962 (JOB NO. 61543)
LC-6 CRANDALL 1968 (JOB NO. A-68049)
LC-C CRANDALL WELLS 1971 (JOB NO. A-71034)
LC-3 CRANDALL 1973 (JOB NO. A-71034-B)
LC-4 CRANDALL 1982 (JOB NO. A-82038)
LC-5 BAGAHI 2000 (JOB NO. 103n-200-00)

CONE PENETRATION TESTS:

B-3 BAGAHI 2000 (JOB NO. 103n-200-00)

MONITORING WELLS:

7 EXISTING MONITORING WELL

DATA:

(-37) ELEVATION OF DENSE SAND & GRAVEL SURFACE

N

SCALE: 1"=40'

0 40 80

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GEOLOGIC CROSS SECTION A-A'
- FIGURE 2.1 -

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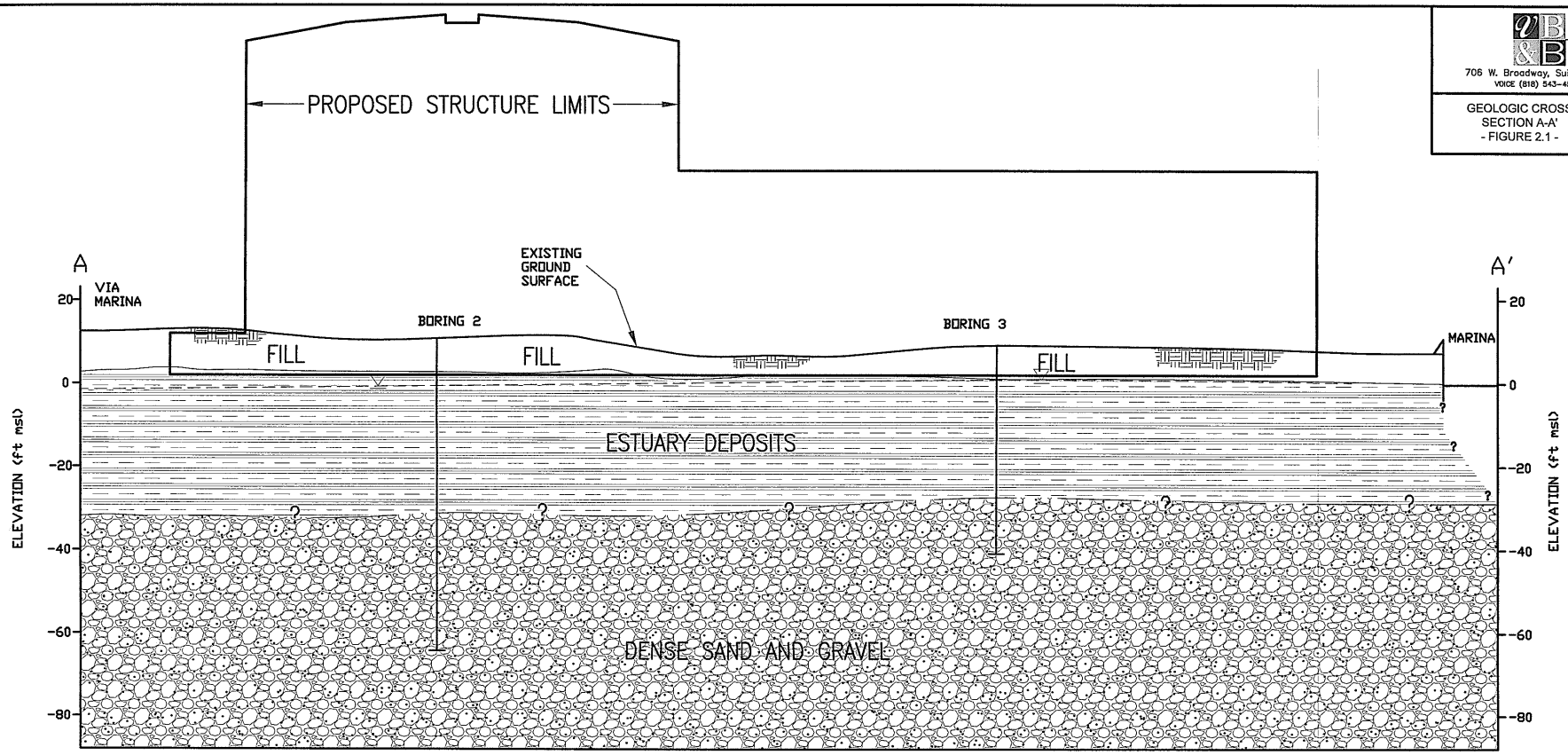

GEOLOGIC CROSS SECTION A–A'

SCALE: 1" = 20'–0"

NOTES:

THIS SECTION IS BASED ON THE GEOLOGIC, AND SOIL CONDITIONS ENCOUNTERED IN OUR EXPLORATIONS. THE CONDITIONS BETWEEN SUCH LOCATIONS HAVE BEEN INTERPOLATED AND COULD VARY FROM THOSE ILLUSTRATED. THIS SECTION IS INTENDED FOR DESCRIPTIVE PURPOSES ONLY.

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GEOLOGIC CROSS SECTION B-B'
- FIGURE 2.2 -

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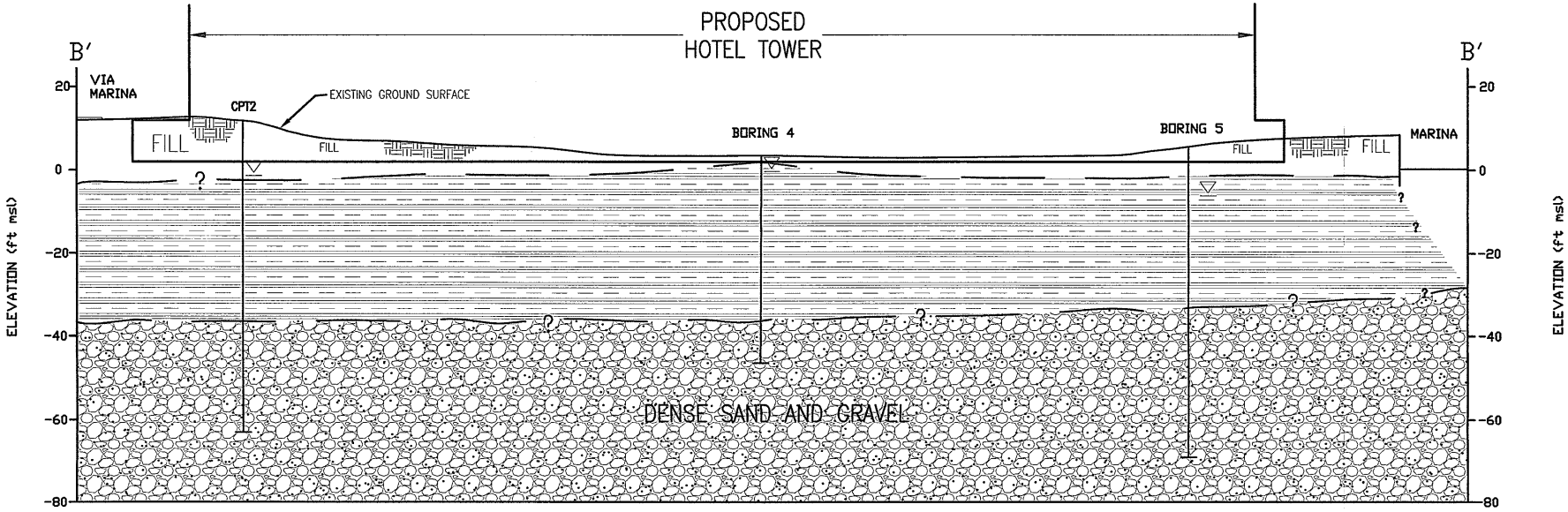

GEOLOGIC CROSS SECTION B–B'

SCALE: 1" = 20'–0"

NOTES:

THIS SECTION IS BASED ON THE GEOLOGIC, AND SOIL CONDITIONS ENCOUNTERED IN OUR EXPLORATIONS. THE CONDITIONS BETWEEN SUCH LOCATIONS HAVE BEEN INTERPOLATED AND COULD VARY FROM THOSE ILLUSTRATED. THIS SECTION IS INTENDED FOR DESCRIPTIVE PURPOSES ONLY.

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REGIONAL GEOLOGIC MAP

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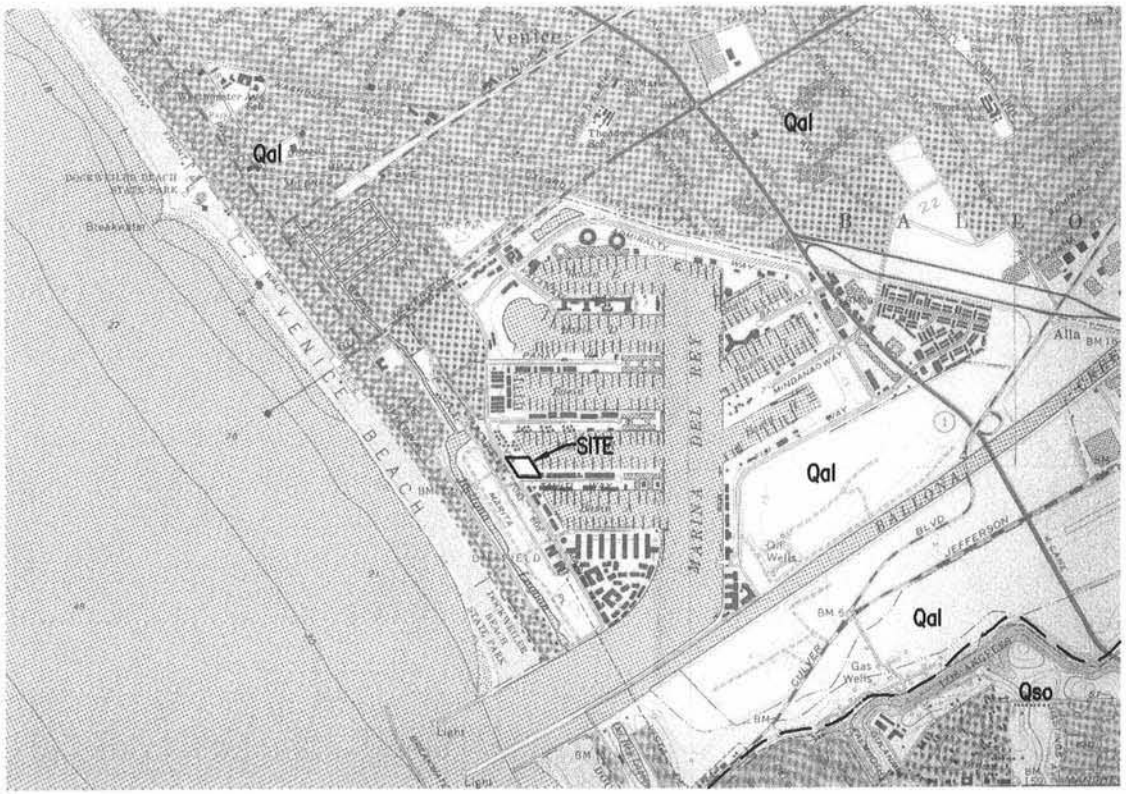
DATE:	OCTOBER 23, 2006



EXPLANATION

Qal ALLUVIUM

Qso OLDER DUNE SAND

GEOLOGIC CONTACT
DASHED WHERE APROXIMATE

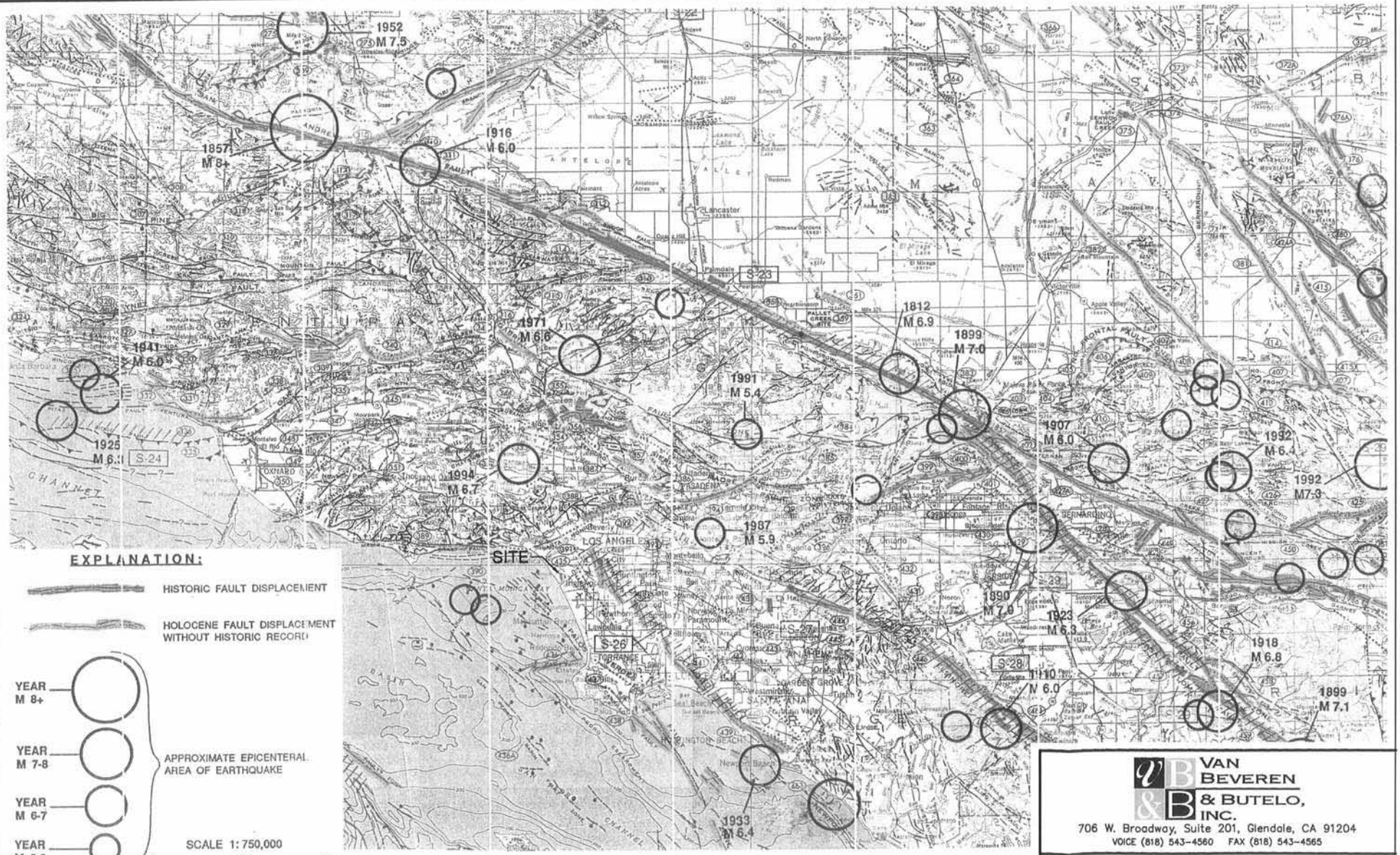
SCALE 1:24000

CONTOUR INTERVAL 10 FEET
DOTTED LINES REPRESENT 5-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES AND SOUNDINGS IN FEET-DATUM IS MEAN LOWER LOW WATER
THE RELATIONSHIP BETWEEN THE TWO DATUMS IS VARIABLE
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE MEAN RANGE OF TIDE IS APPROXIMATELY 4 FEET

ROAD CLASSIFICATION
Heavy duty — Light duty
Medium duty — Unimproved dirt
Inter-state Route — State Route

DRAWING REFERENCE: USGS, VENICE 7½ MINUTE QUADRANGLE
AERIAL GEOLOGY FROM DWR BULLETIN 104, PLATE 38

FIGURE 3



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REGIONAL SEISMICITY MAP

- FIGURE 4 -

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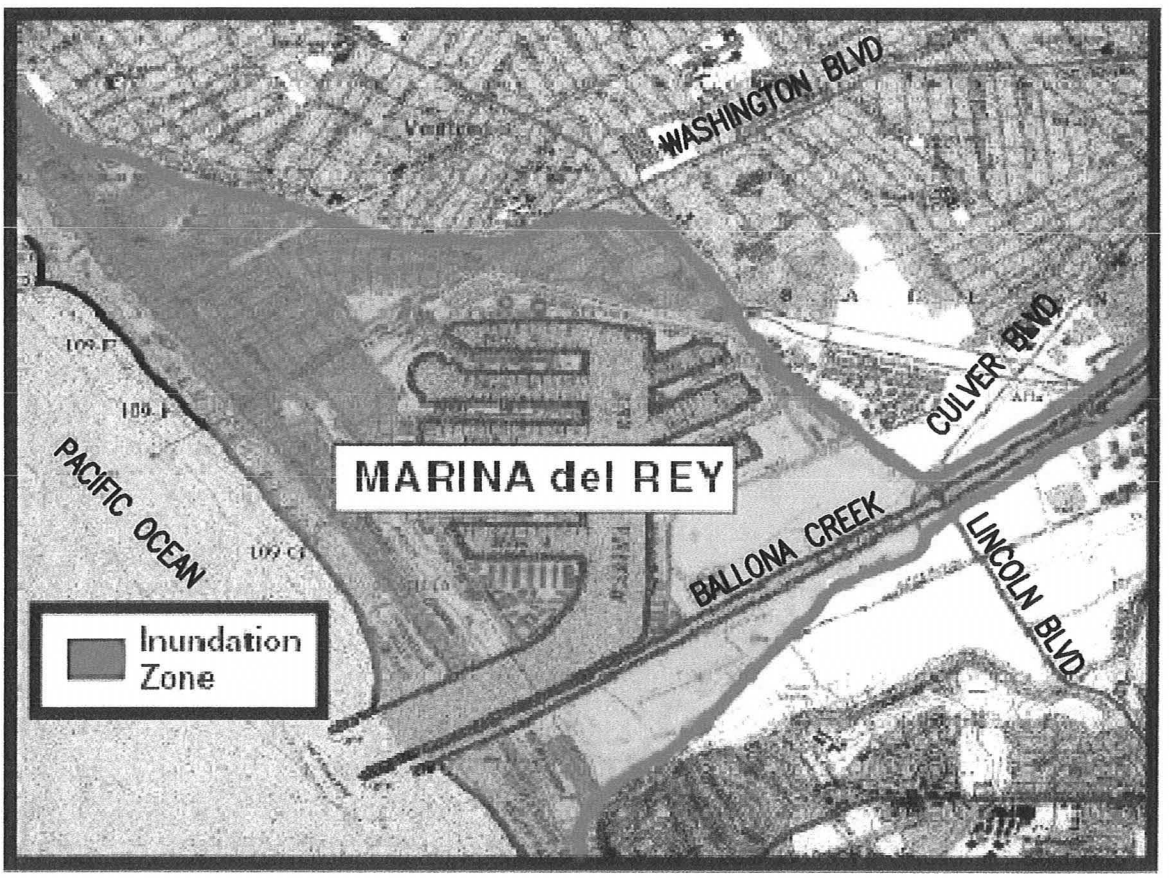
TSUNAMI INUNDATION MAP	JOB NO. 04-012.3	
	DRAWN BY: LL	CHECKED BY: JB
	DATE: OCTOBER 23, 2006	

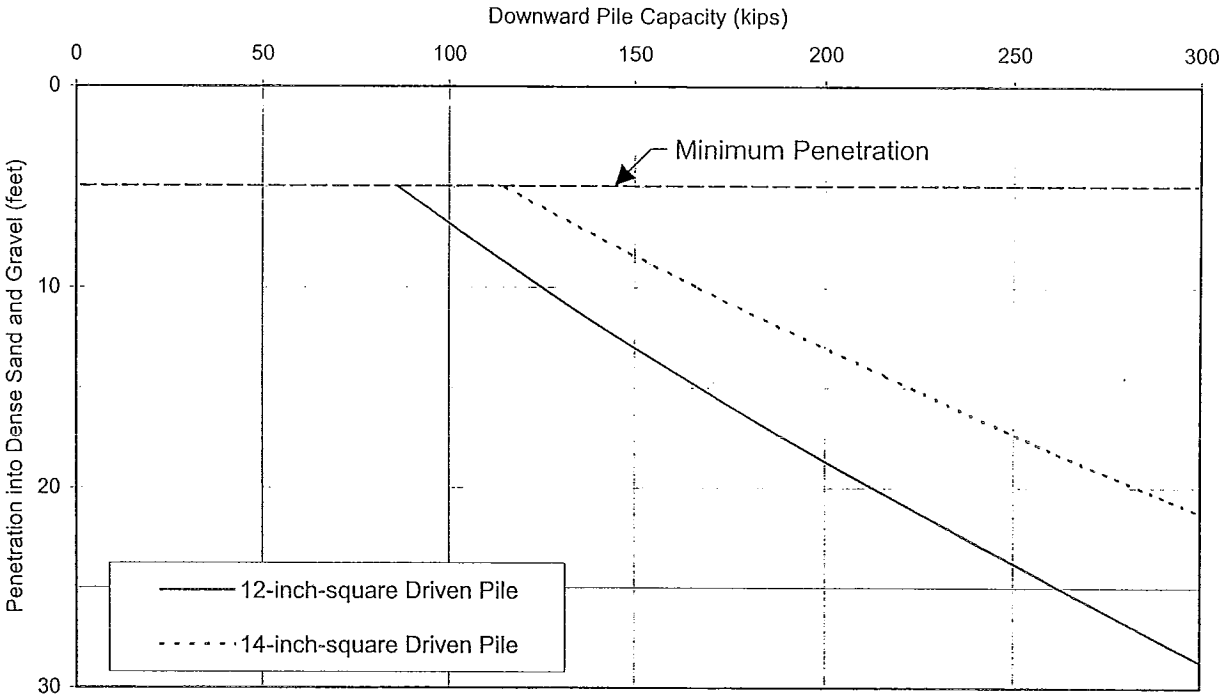


NOT TO SCALE

REFERENCE: EISNER, et al, 2001, ITS 2001 PROCEEDINGS

FIGURE 5

G:\2004 Projects\04-012 Woodfin Suites Hotel\04-012.3 Comprehensive\Graphics\PLOTPLAN.dwg, 10/23/2006 4:06:55 PM, \\server01\HP DeskJet 1220C



NOTES:

1) The indicated capacities are for dead plus live loads. A one-third increase may be used for wind or seismic loads.

2) Upward capacities may be taken as one-half the downward capacities.

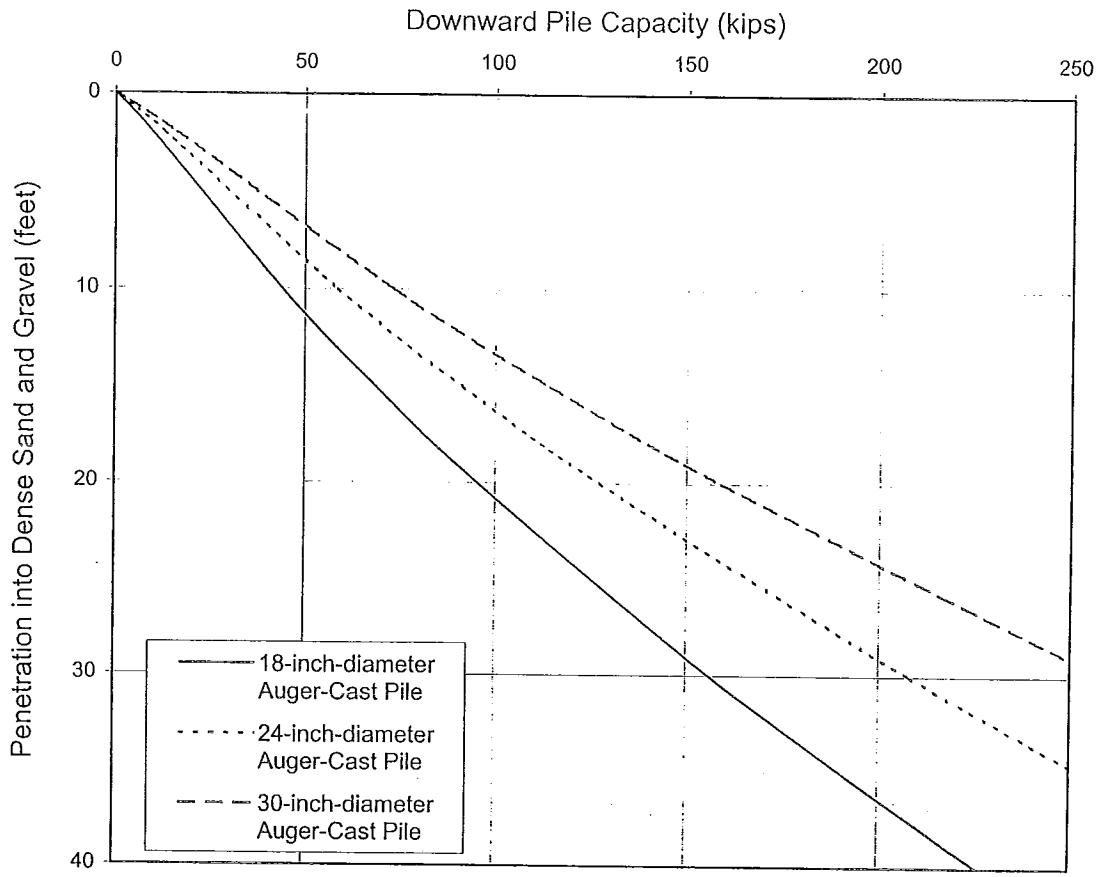
3) Piles in groups should be spaced at least 2-1/2 diameters and at least 3 feet on centers.

DRIVEN PILE CAPACITIES

VAN BEVEREN & BUTELO, INC.

Figure 6.1

Project No: 04-012.3 Date: 10/04/06 By: FA



NOTES:

1) The indicated capacities are for dead plus live loads. A one-third increase may be used for wind or seismic loads.

2) Upward capacities may be taken as one-half the downward capacities.

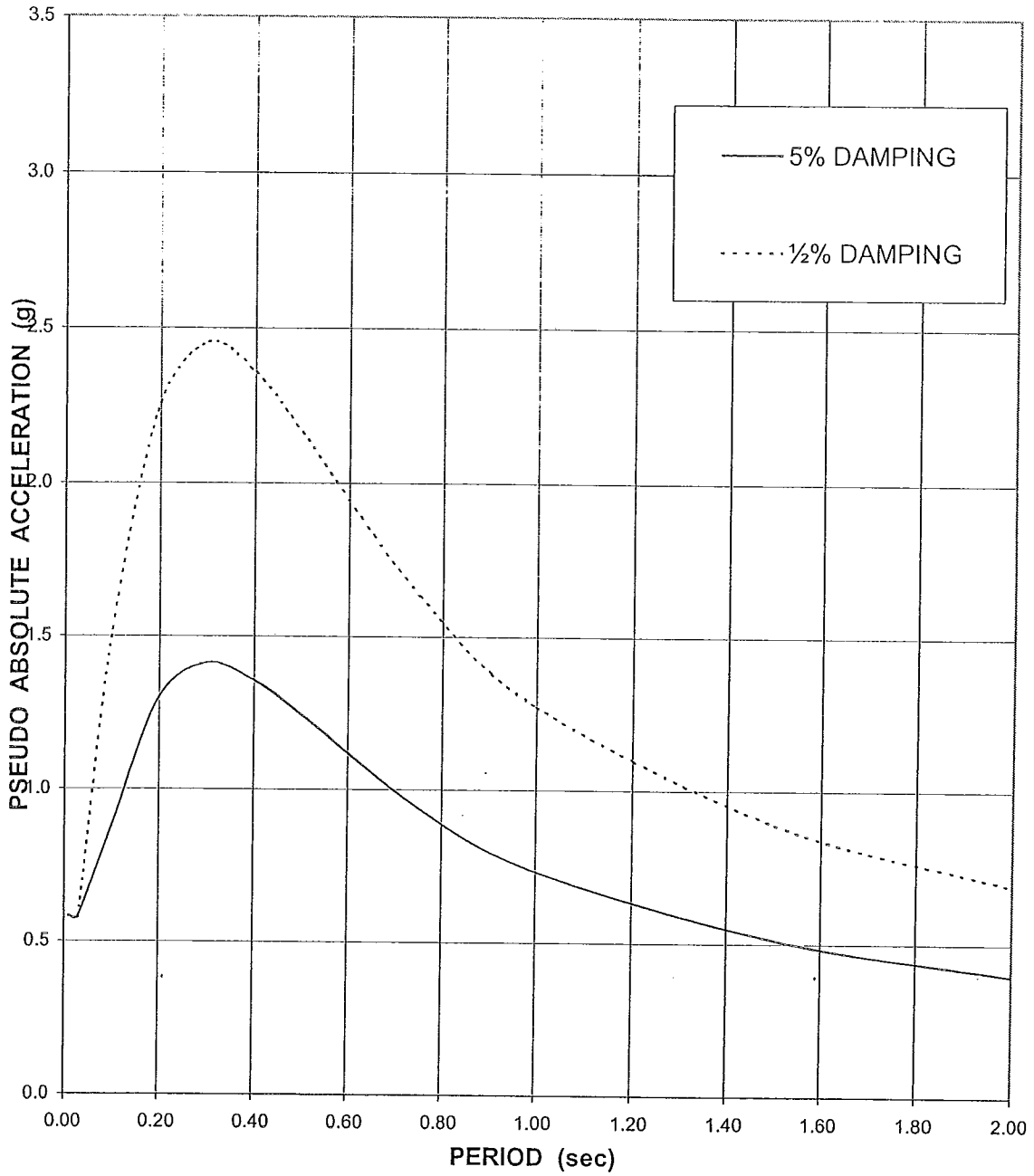
3) Piles in groups should be spaced at least 2-1/2 diameters and at least 3 feet on centers.

AUGER CAST PILE CAPACITIES

VAN BEVEREN & BUTELO, INC.

Figure 6.2

Project No: 04-012.3 Date: 10/04/06 By: FA



RESPONSE SPECTRA

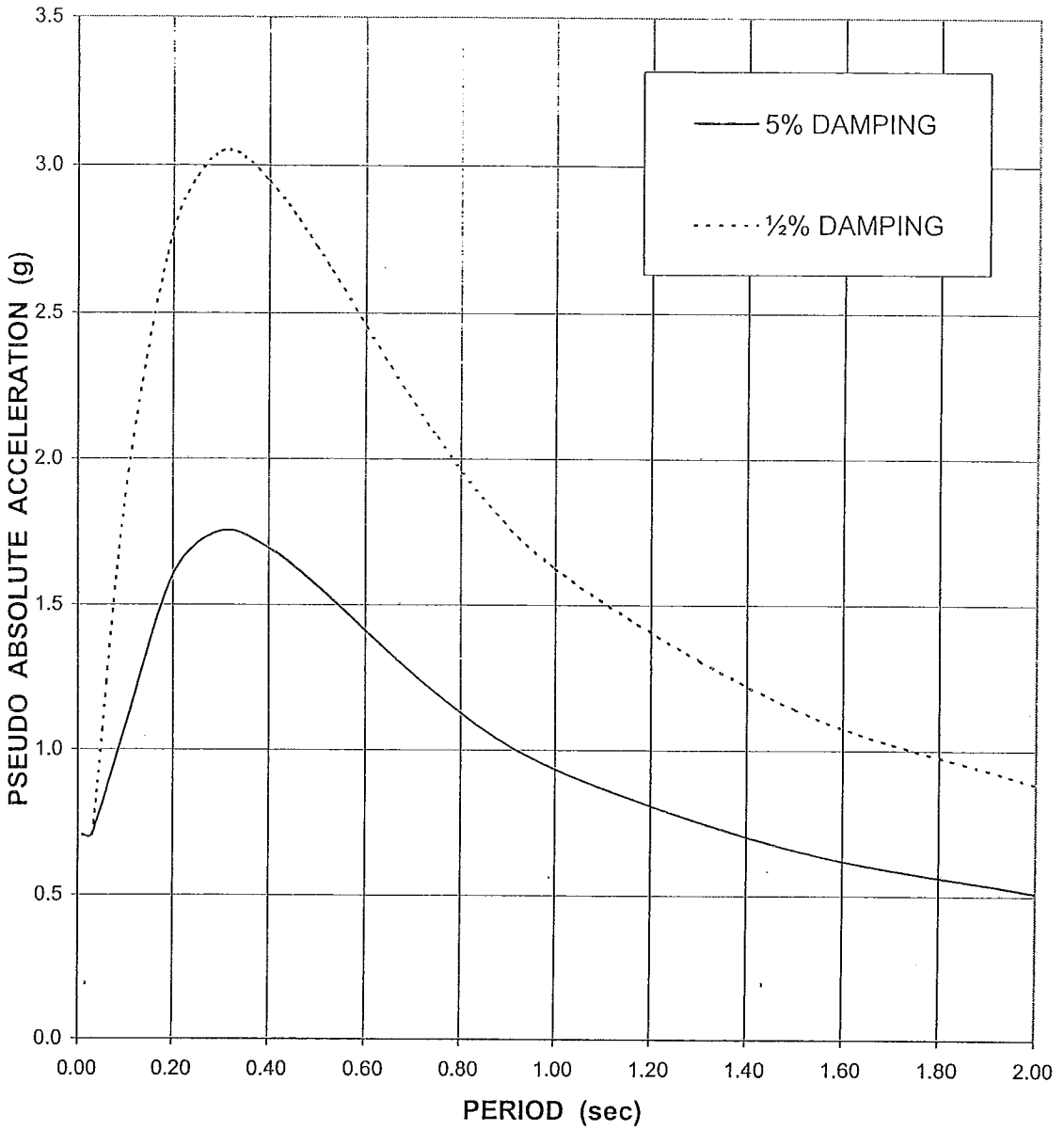
10% PROBABILITY OF EXCEEDENCE IN 50 YEARS
DESIGN BASIS EARTHQUAKE

WOODFIN SUITE HOTEL AND TIMESHARE RESORT

VAN BEVEREN & BUTELO, INC.

JOB NO.: 04-012.3 DATE: August 16, 2006 BY: FA

FIGURE 7.1



RESPONSE SPECTRA

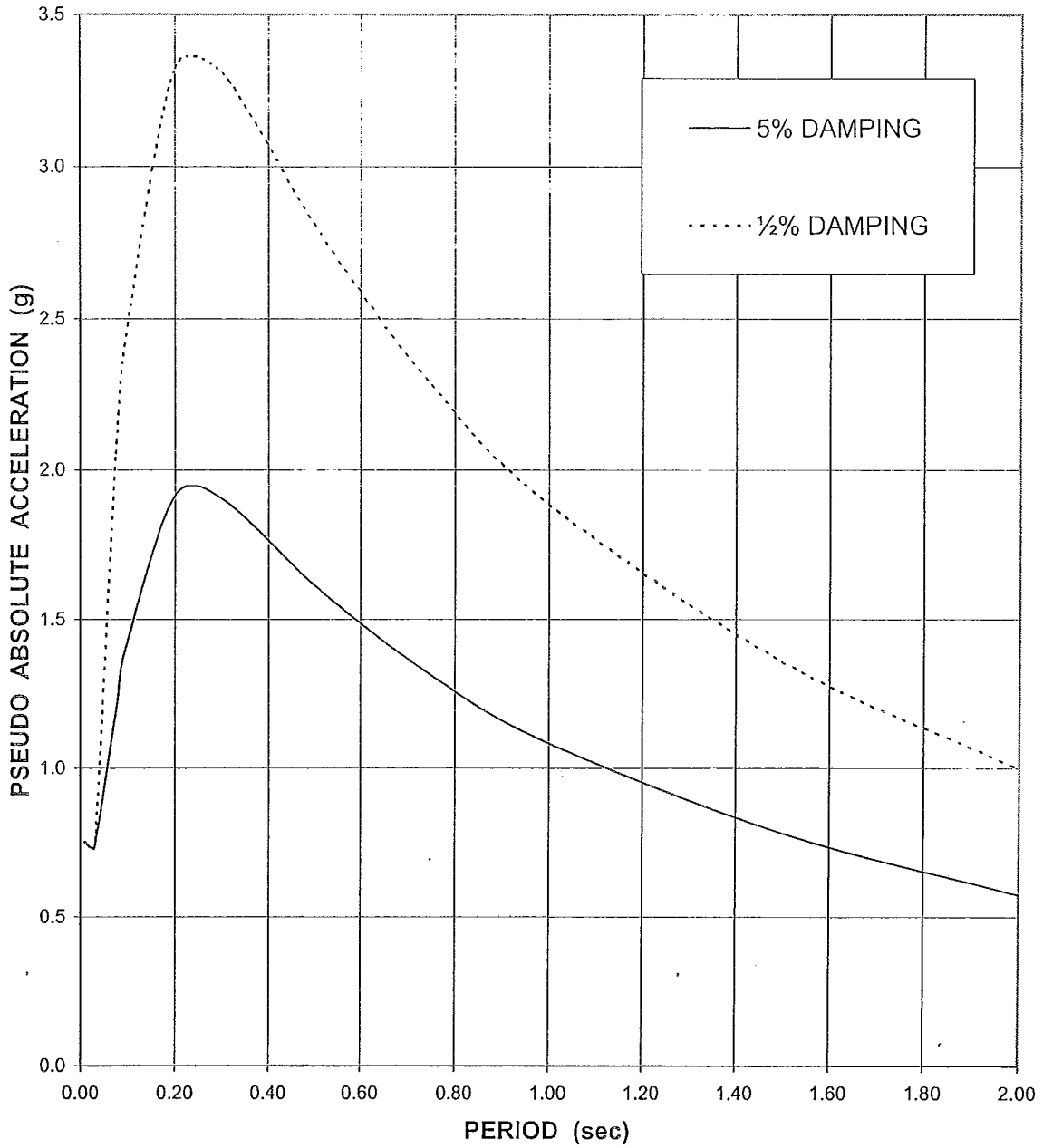
10% PROBABILITY OF EXCEEDENCE IN 100 YEARS
UPPER BOUND EARTHQUAKE

WOODFIN SUITE HOTEL AND TIMESHARE RESORT

VAN BEVEREN & BUTELO, INC.

JOB NO.: 04-012.3 DATE: August 16, 2006 BY: FA

FIGURE 7.2



RESPONSE SPECTRA

2% PROBABILITY OF EXCEEDENCE IN 50 YEARS
MAXIMUM CONSIDERED EARTHQUAKE

WOODFIN SUITE HOTEL AND TIMESHARE RESORT

VAN BEVEREN & BUTELO, INC.

JOB NO.: 04-012.3 DATE: August 16, 2006 BY: FA

FIGURE 7.3

APPENDIX A

EXPLORATIONS AND LABORATORY TESTS

APPENDIX A
EXPLORATIONS AND LABORATORY TESTS

EXPLORATIONS

We recently supplemented the previous explorations by drilling five borings and performing three Cone Penetration Tests at the locations shown on Figure 1. The borings were drilled to depths of 50 to 75 feet below the existing grade using 8-inch-diameter rotary wash-type drilling equipment with drilling mud to prevent caving. The mud was removed following completion of the drilling to permit future measurements of the water level.

The soils encountered were logged by our geologist, and undisturbed and bulk samples were obtained for laboratory inspection and testing. The logs of the borings are presented on Figures A-1.1 through A-1.5; the depths at which undisturbed samples were obtained are indicated to the left of the boring logs. The number of blows required to drive the sampler 12 inches using a 300-pound hammer falling 18 inches is indicated on the logs. In addition to obtaining undisturbed samples, standard penetration tests (SPT) were performed in all of the borings; the results of the tests are indicated on the logs.

The cone penetration tests were performed for us by Kehoe Testing and Engineering to depths of 75 feet. The results of the cone penetration tests are presented on Figures A-2.1 through A-2.2. CPT shear wave measurements were taken on the CPTs and are presented on Figure A-2.3.

The soils are classified in the accordance with the Unified Soil Classification System described in Figure A-3.

Data were also available from prior investigation at the site. A list of previous reports is presented at the end of our report. The logs of the prior explorations are presented in Appendix B.

LABORATORY TESTS

Laboratory tests were performed on selected samples obtained from the borings to aid in the classification of the soils and to determine their engineering properties.

The field moisture content and dry density of the soils encountered were determined by performing tests on the undisturbed samples. The results of the tests are shown to the left of the boring logs.

Direct shear tests were performed on selected undisturbed samples to determine the strength of the soils. The tests were performed at field moisture content and after soaking to near-saturated moisture content and at various surcharge pressures. The yield-point values determined from the direct shear tests are presented on Figures A-4.1 and A-4.2, Direct Shear Test Data.

Confined consolidation tests were performed on 7 undisturbed samples to determine the compressibility of the soils. Water was added to 6 of the samples during the tests to illustrate the effect of moisture on the compressibility. The results of the tests are presented on Figures A-5.1 through A-5.4, Consolidation Test Data.

To determine the particle size distribution of the soils and to aid in classifying the soils, mechanical analyses and hydrometer tests were performed on selected samples. The results of the mechanical analyses and hydrometer tests, where applicable, are presented on Figures A-6.1 to A-6.14, Particle Size Distribution.

In addition to the full mechanical analyses, tests to determine the percentage of fines (material passing through a No. 200 sieve) in selected samples were performed. The results of these tests are presented on the boring logs.

The Atterberg Limits of selected samples were determined. The results of these tests are presented on the boring logs.

To provide information for paving design, a stabilometer test ("R" value test) was performed on a sample of the upper soils. The test was performed for us by LaBelle·Marvin Professional Pavement Engineering. The results of the test are presented on Figures A-7.1 and A-7.2.

A soil corrosivity study was performed on samples of the on-site soils by ConCeCo Engineering. The results of the study are presented in their report dated August 28, 2006 which is presented on Figure A-8.

BORING 1

Date Drilled: June 30, 2006

Equipment Used: Mud Rotary Wash (8-inch Diameter)

Depth to Water: Groundwater at 15 feet

Driving Weight & Drop: 300 lbs./18-in. (Undisturbed Samples)
140 lbs./30-in (SPT)

SURFACE ELEVATION: 13 feet (MSL)

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT)	BLOW COUNT (blows / 12-inches)	SAMPLE LOCATION	Description
				27			**FILL** SP - SAND - fine, few gravel (up to 1"), few shell fragments, gray [No Recovery]
10		7.1	93	29			
	5	14.4	100	21			
5		30.5	91	22			Gravel (up to 2 inches) [3% Passing No. 200]
	10			9			[No Recovery]
		50.2	69	2			**ALLUVIUM** CL - SILTY CLAY - dark gray [LL=43 PI=25]
0							
	15		2				
				8			SM - SILTY SAND - fine, dark gray [No Recovery]
-5		25.9	98	18			[13% Passing No. 200]
	20			6			[No Recovery]
		29.0	91	21			
-10							
	25		29				[17% Passing No. 200]
							CL - SILTY CLAY - dark gray
-15							
	30	57.3	67	3			
							SM - SILTY SAND - dark gray, few shell fragments
-20							
	35		6				[22% Passing No. 200 Sieve]
-25							
	40	12.3	125	45			Gravel (up to 2 inches)

(Continued on next page)

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Job No: 04-012.3 By: MO Date: 7-10-2006 Checked: Printed: 10-10-06 [LOG FOR FIELD; 04-012.3.GPJ]

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.1a

BORING 1
(Continued)

Date Drilled: June 30, 2006

Equipment Used: Mud Rotary Wash (8-inch Diameter)

Depth to Water: Groundwater at 15 feet

Driving Weight & Drop: 300 lbs./18-in. (Undisturbed Samples)
140 lbs./30-in (SPT)

SURFACE ELEVATION: 13 feet (MSL)

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT)	BLOW COUNT (blows / 12-inches)	SAMPLE LOCATION	
							SM - SILTY SAND - *continued*
-30							Fine to coarse, grayish brown
	45		28				[33% Passing No. 200]
							SW - SAND WITH GRAVEL - well graded, dark gray
-35							[Rig Chattering]
	50	10.6	125	50			**END OF BORING 50 FEET**
-40							
	55						
-45							
	60						
-50							
	65						
-55							
	70						
-60							
	75						
-65							
	80						

Notes

1) Fill to 11 feet.

2) Groundwater encountered at 15 feet.

3) Boring backfilled with bentonite and cement grout.

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Job No: 04-012.3 By: MO Date: 7-10-2006 Checked: Printed: 10-10-06 [LOG FOR FIELD: 04-012.3.GPJ]

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.1b

BORING 2

Date Drilled: June 29, 2006

Equipment Used: Mud Rotary Wash (8-inch Diameter)

Depth to Water: Groundwater at 11 feet

Driving Weight & Drop: 300 lbs./18-in. (Undisturbed Samples)
140 lbs./30-in (SPT)

SURFACE ELEVATION: 11 feet (MSL)

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT)	BLOW COUNT (blows / 12-inches)	SAMPLE LOCATION	Description
10							**FILL** SW - SAND - well graded, gravel (up to 1 inch), gray
		10.2	97	23			
	5						
5				18			[No Recovery]
		24.9	93	16			
				25			**ALLUVIUM** CL - SILTY CLAY - gray to dark gray
	10						
0		66.0	59	3			[No Recovery]
		72.3	57	3			
				4			SC - CLAYEY SAND - fine, dark gray, abundant shell fragments
	15						[No Recovery]
-5			10				[16% Passing No. 200 Sieve]
				12			[No Recovery]
		46.9	71	12			SP-SM - SAND WITH SILTY CLAY - gray, abundant shell fragments
		27.4	97	40			[5% Passing No. 200 Sieve]
	20						
-10			17				Few gravel (up to 1 inch) [9% Passing No. 200 Sieve]
		29.1	93	31			
	25						
-15			14				
							CL - SILTY CLAY - dark gray
	30						Few shell fragments
-20		45.1	76	4			[LL=45 PI=22]
	35						SC -CLAYEY SAND WITH GRAVEL - fine, dark gray
-25			6				[48% Passing No. 200 Sieve]
	40						Fine to coarse, dark brown

(Continued on next page)

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.2a

Job No: 04-012.3 By: MO Date: 7-10-2006 Checked: Printed: 10-10-06 [LOG FOR FIELD: 04-012.3.GPJ]

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

BORING 2
(Continued)

Date Drilled: June 29, 2006

Equipment Used: Mud Rotary Wash (8-inch Diameter)

Depth to Water: Groundwater at 11 feet

Driving Weight & Drop: 300 lbs./18-in. (Undisturbed Samples)
140 lbs./30-in (SPT)

SURFACE ELEVATION: 11 feet (MSL)

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT) BLOW COUNT (blows / 12-inches)	SAMPLE LOCATION	Description
-30		15.7	118	11		SC -CLAYEY SAND WITH GRAVEL- *continued* [45% Passing No. 200 Sieve]
						SP-SM - SAND WITH SILT AND GRAVEL - fine, gray to dark brown [Rig chattering]
	45					
-35			38			[10% Passing No. 200 Sieve]
	50					
-40		19.9	105	100		SP - SAND - fine, gray
						SM - SILTY SAND WITH GRAVEL - fine, some clay, orange to dark gray [Rig Chattering]
	55					
-45		13.9	121	50		
	60					
-50		18.2	107	50		
	65					
-55		17.2	112	50		[16% Passing No. 200 Sieve]
						SP-SM - SAND WITH SILT AND GRAVEL - fine, gray with heavy staining
	70					
-60		27.2	94	43		[10% Passing No. 200 Sieve]
	75	22.1	101	75		
-65						END OF BORING 75 FEET
	80					

Notes

1) Fill to 9 feet.

2) Groundwater encountered at 11 feet.

3) Boring backfilled with bentonite and cement grout.

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Job No: 04-012.3 By: MO Date: 7-10-2006 Checked: Printed: 10-10-06 [LOG FOR FIELD: 04-012.3.GPJ]

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.2b

BORING 3

Date Drilled: June 28, 2006

Equipment Used: Mud Rotary Wash (8-inch Diameter)

Depth to Water: Groundwater at 8 feet

Driving Weight & Drop: 300 lbs./18-in. (Undisturbed Samples)
140 lbs./30-in (SPT)

SURFACE ELEVATION: 9 feet (MSL)

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT)	BLOW COUNT (blows / 12-inches)	SAMPLE LOCATION	Description
							FILL SP - SAND - fine, gray to dark gray
5		11.0	91	16			
	5	13.9	95	7			Few gravel (up to 2 inches)
0		60.4	62	1			**ALLUVIUM** CL - SILTY CLAY - some fine sand, gray to dark gray [65% Passing No. 200 Sieve]
	10						
				5			SP-SM - SAND WITH SILT - dark gray, few shell fragments [No Recovery]
-5							
	15		13				
				7			[No Recovery]
-10							
	20		40				Some clay [7% Passing No. 200 Sieve]
		21.4	108	50			SP - SAND - fine to medium, gray to dark gray [3% Passing No. 200 Sieve]
-15							CL- SILTY CLAY - dark gray
	25		1				
-20							
	30	28.8	94	4			Thin interbeds of silty sand
-25							
	35		7				[56% Passing No. 200 Sieve]
							SP - SAND WITH GRAVEL - fine, dark gray
-30							[No Recovery]
	40			50			

(Continued on next page)

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Job No: 04-012.3 By: MO Date: 7-10-2006 Checked: Printed: 10-10-06 [LOG FOR FIELD: 04-012.3.GPJ]

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.3a

BORING 3
(Continued)

Date Drilled: June 28, 2006
Equipment Used: Mud Rotary Wash (8-inch Diameter)

Depth to Water: Groundwater at 8 feet
Driving Weight & Drop: 300 lbs./18-in. (Undisturbed Samples)
140 lbs./30-in (SPT)

SURFACE ELEVATION: 9 feet (MSL)

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT)	BLOW COUNT (blows / 12-inches)	SAMPLE LOCATION	
		23.2	114		50		SP - SAND WITH GRAVEL - *continued*
-35	45		59				SW - SAND WITH GRAVEL - well graded, gray [Rig Chattering]
-40	50	12.0	119		50		END OF BORING 50 FEET
-45	55						
-50	60						
-55	65						
-60	70						
-65	75						
-70	80						

Notes

1) Fill to 8 feet.

2) Groundwater encountered at 8 feet.

3) Boring backfilled with bentonite and cement grout.

Job No: 04-012.3 By: MO Date: 7-10-2006 Checked: Printed: 10-10-06 [LOG FOR FIELD: 04-012.3.GPJ]

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.3b

BORING 4

Date Drilled: June 28, 2006
Equipment Used: Mud Rotary Wash (8-inch Diameter)

Depth to Water: Groundwater at 3 feet
Driving Weight & Drop: 300 lbs./18-in. (Undisturbed Samples)
140 lbs./30-in (SPT)

SURFACE ELEVATION: 3 feet (MSL)

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT)	BLOW COUNT (blows / 12-inches)	SAMPLE LOCATION	Description
							FILL SM - SILTY SAND - fine, light gray
		14.8	105	28			**ALLUVIUM** SM - SILTY SAND - fine, heavy iron stains, gray
0							
							CH - CLAY - dark gray [LL=74 PI=50]
	5	73.2	56	1			
							SP - SAND - fine, gray
-5		25.0	103	7			
	10	30.1	73	10			Few shell fragments [2% Passing No. 200 Sieve]
				15			[No Recovery]
-10		30.1	90	12			SP-SM - SAND WITH SILT - fine, few shell fragments
	15						[9% Passing No. 200 Sieve]
			29				
-15				22			[No Recovery]
	20	52.7	71	2			MH - SILT - dark gray [LL=60 PI=28]
-20			1				Few sand
	25						
				5			[No Recovery]
-25		26.3	100	10			SM - SILTY SAND - fine to medium, gray
	30						CL-ML - SILTY CLAY - dark gray
			8				[63% Passing No. 200 Sieve] [LL=24 PI=7]
-30							
	35						
		21.2	107	11			CH - CLAY - grayish brown, few coarse sand
-35							
	40						

(Continued on next page)

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Job No: 04-012.3 By: MO Date: 7-10-2006 Checked: Printed: 10-10-06 [LOG FOR FIELD: 04-012.3.GPJ]

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.4a

BORING 4
(Continued)

Date Drilled: June 28, 2006

Equipment Used: Mud Rotary Wash (8-inch Diameter)

Depth to Water: Groundwater at 3 feet

Driving Weight & Drop: 300 lbs./18-in. (Undisturbed Samples)
140 lbs./30-in (SPT)

SURFACE ELEVATION: 3 feet (MSL)

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT)	BLOW COUNT (blows / 12-inches)	SAMPLE LOCATION	
							SW - SAND WITH GRAVEL - well graded, rounded gravel, gray [Rig Chattering]
-40			67				
	45						
		8.7	69		50		Gravel (up to 2½ inches)
-45							
			40				
	50						END OF BORING 50 FEET
-50							
	55						
-55							
	60						
-60							
	65						
-65							
	70						
-70							
	75						
-75							
	80						

Notes

1) Fill to 1½ feet.

2) Groundwater encountered at 3 feet.

3) Boring backfilled with sand and bentonite.

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Job No: 04-012.3 By: MO Date: 7-10-2006 Checked: Printed: 10-10-06 [LOG FOR FIELD: 04-012.3.GPJ]

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.4b

BORING 5

Date Drilled: June 27, 2006
Equipment Used: Mud Rotary Wash (8-inch Diameter)

Depth to Water: Groundwater at 11 feet
Driving Weight & Drop: 300 lbs./18-in. (Undisturbed Samples)
140 lbs./30-in (SPT)

SURFACE ELEVATION: 8 feet (MSL)

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT)	BLOW COUNT (blows / 12-inches)	SAMPLE LOCATION	Description
							FILL SM - SANDY SILT - fine, gravel (up to 2 inches), dark gray
5	5.7	69		7			
							SC - CLAYEY SAND - gray
5							[43% Passing No. 200 Sieve]
	29.3	94		6			
0							**ALLUVIUM** SP - SAND - fine, bluish gray
10							[No Recovery]
				6			
	30.3	73		7			Dark gray, abundant shell fragments
-5	22.5	103		18			[3% Passing No. 200 Sieve]
15	31.0	92		10			SP-SM - SILTY SAND - gray, few shell fragments [12% Passing No. 200 Sieve]
				9			[No Recovery]
-10			1				CH - CLAY - dark gray
20	79.5	53		2			[LL=63 PI=37]
-15							
25			3				SC - CLAYEY SAND - fine, dark gray, few shell fragments [41% Passing No. 200 Sieve]
-20							
30							SM - SILTY SAND - fine, dark gray
				4			[No Recovery]
	26.8	99		12			[35% Passing No. 200 Sieve]
-25							
35			9				SP-SC - SAND WITH CLAY - dark gray [10% Passing No. 200 Sieve]
-30							
40							SW - SAND WITH GRAVEL - well graded, gravel (up to 2 inches), some silty clay, dark gray

(Continued on next page)

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Job No: 04-012.3 By: MO Date: 7-10-2006 Checked: Printed: 10-10-06 [LOG FOR FIELD: 04-012.3.GPJ]

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.5a

BORING 5
(Continued)

Date Drilled: June 27, 2006
Equipment Used: Mud Rotary Wash (8-inch Diameter)

Depth to Water: Groundwater at 11 feet
Driving Weight & Drop: 300 lbs./18-in. (Undisturbed Samples)
140 lbs./30-in (SPT)

SURFACE ELEVATION: 8 feet (MSL)

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT)	BLOW COUNT (blows / 12-inches)	SAMPLE LOCATION	Description
		10.6	128		41		SW - SAND WITH GRAVEL - *continued* [Rig Chattering]
-35							
	45			28			[5% Passing No. 200 Sieve]
-40							
	50	9.9	128		60		Gravel (up to 2½ inches)
-45							
	55			30			[Rig Chattering]
-50							
	60	41.4	96		70		Gravel (up to 3 inches)
-55							
	65	24.6	99		50		SP-SM - SAND WITH SILT AND GRAVEL - fine, iron staining, grayish brown [10% Passing No. 200 Sieve] Few shell fragments
-60							
	70	32.2	92		40		
-65							
	75	32.8	87		43		[45% Passing No. 200 Sieve]
-70							
	80						

END OF BORING 75 FEET

NOTES

1) Fill to 7 feet.

2) Groundwater encountered at 11 feet.

3) Boring backfilled with bentonite and cement grout.

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Job No: 04-012.3 By: MO Date: 7-10-2006 Checked: Printed: 10-10-06 [LOG FOR FIELD: 04-012.3.GPJ]

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

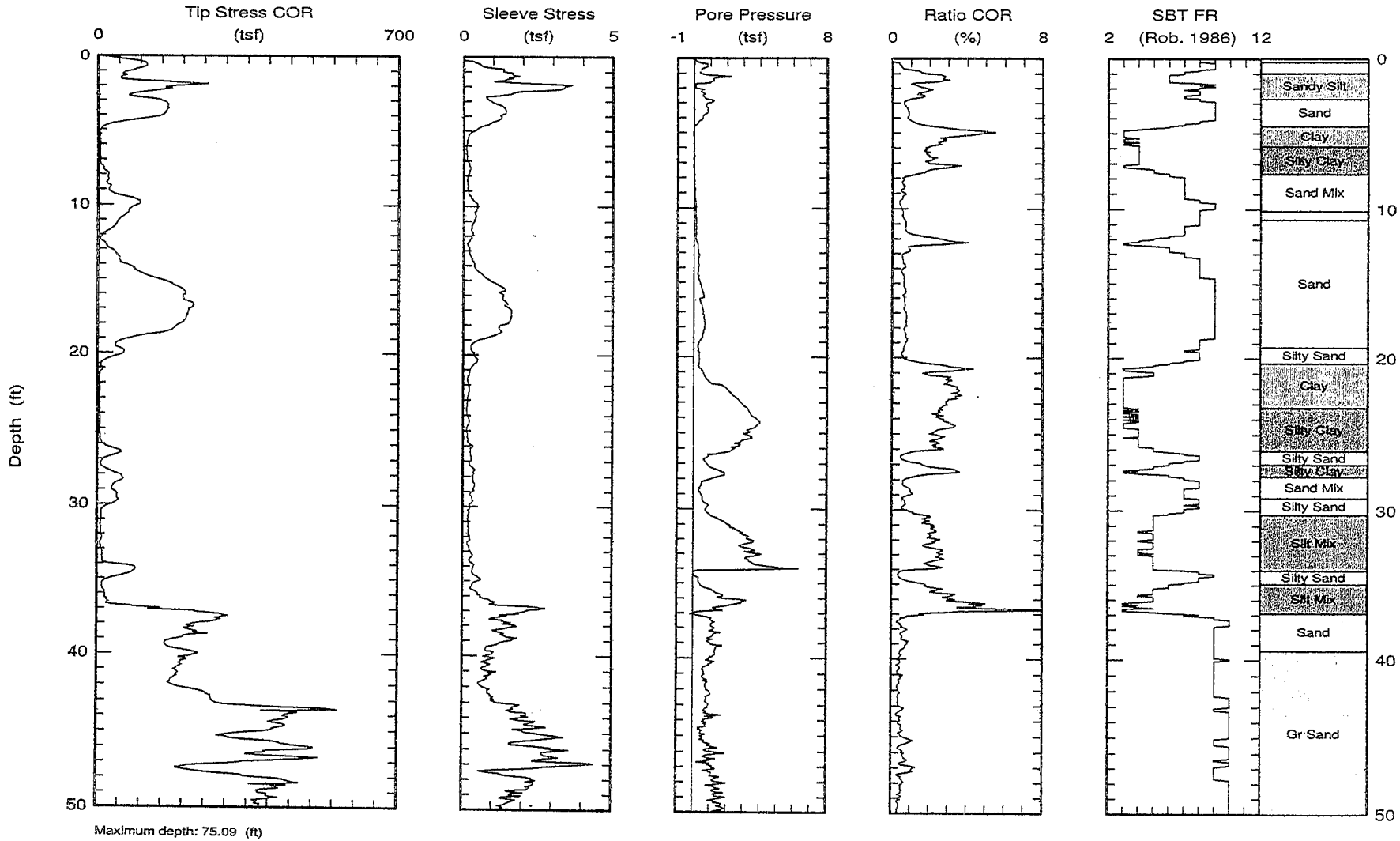
FIGURE A-1.5b

Kehoe Testing & Engineering
Office: (714) 901-7270
Fax: (714) 901-7289
skehoe@msn.com

CPT Data
30 ton rig

Date: 29/Jun/2006
Test ID: CPT-1
Project: MarinaDelRey

Client: Van Beveren & Butelo Inc.
Job Site: Woodfin Suites



Maximum depth: 75.09 (ft)
Page 1 of 2

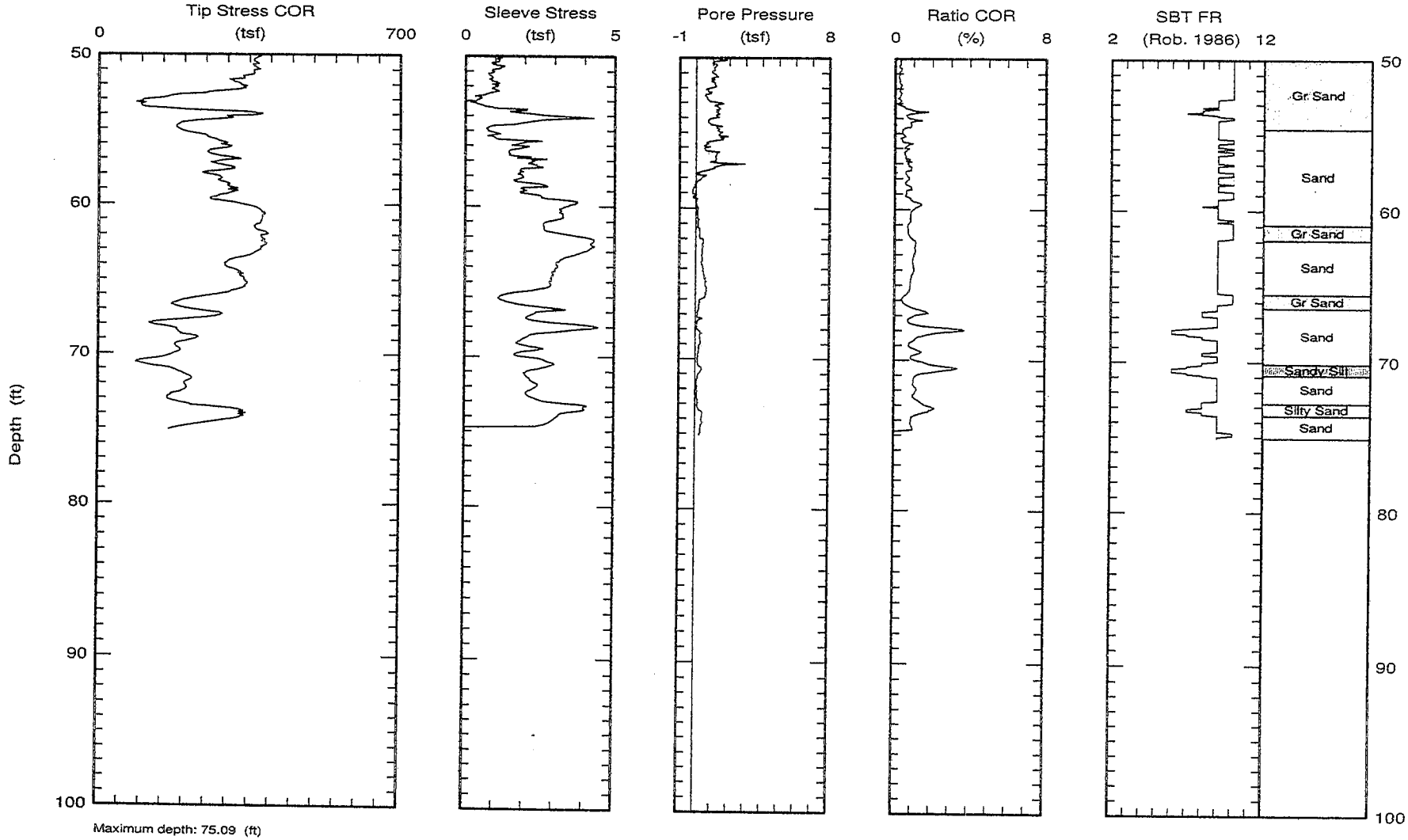
FIGURE A-2.1a

Kehoe Testing & Engineering
Office: (714) 901-7270
Fax: (714) 901-7289
skehoe@msn.com

CPT Data
30 ton rig

Date: 29/Jun/2006
Test ID: CPT-1
Project: MarinaDelRey

Client: Van Beveren & Butelo Inc.
Job Site: Woodfin Suites



Maximum depth: 75.09 (ft)
Page 2 of 2

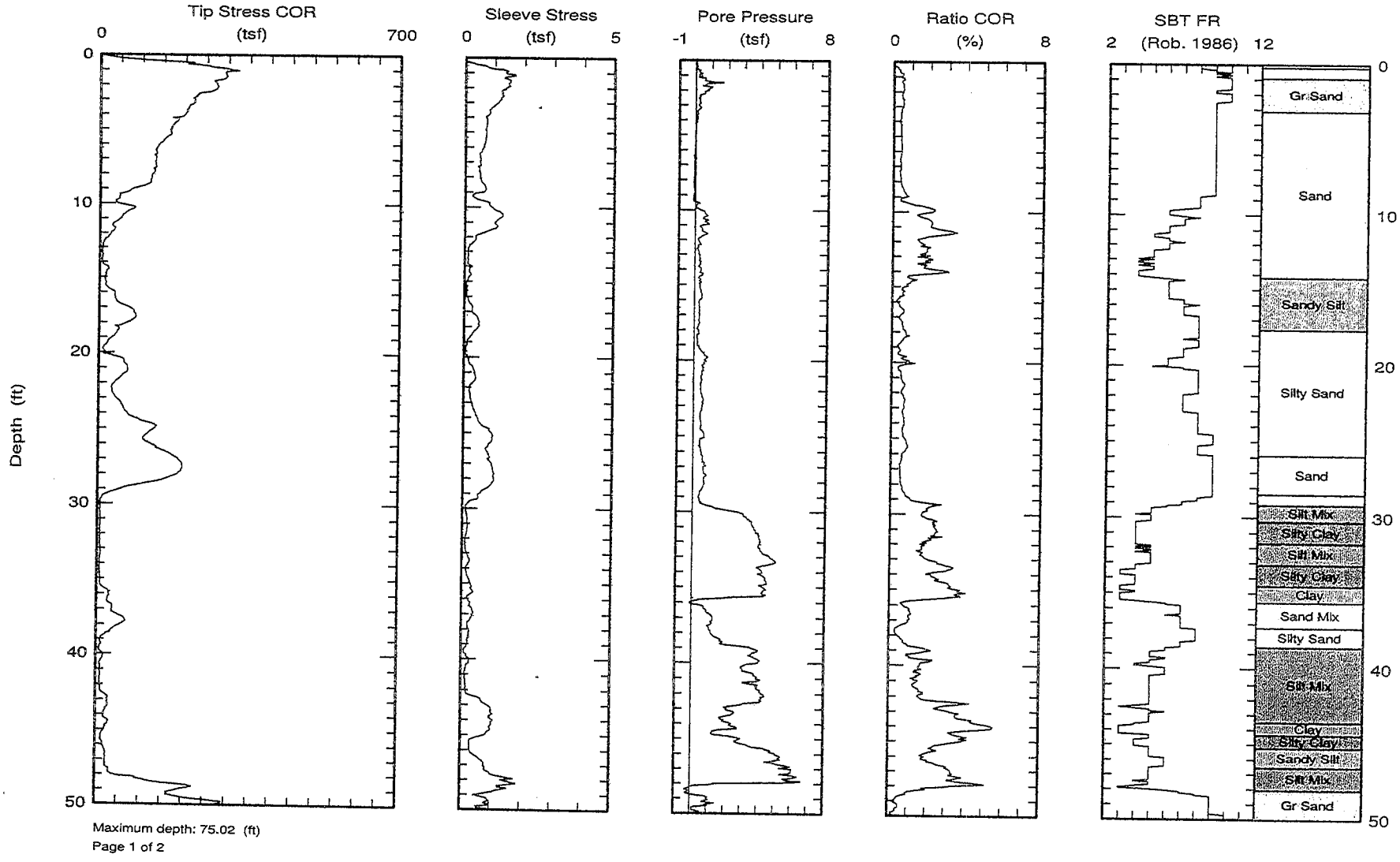
FIGURE A-2.1b

Kehoe Testing & Engineering
Office: (714) 901-7270
Fax: (714) 901-7289
skehoe@msn.com

CPT Data
30 ton rig

Date: 29/Jun/2006
Test ID: CPT-2
Project: MarinaDelRey

Client: Van Beveren & Butelo Inc.
Job Site: Woodfin Suites



Maximum depth: 75.02 (ft)
Page 1 of 2

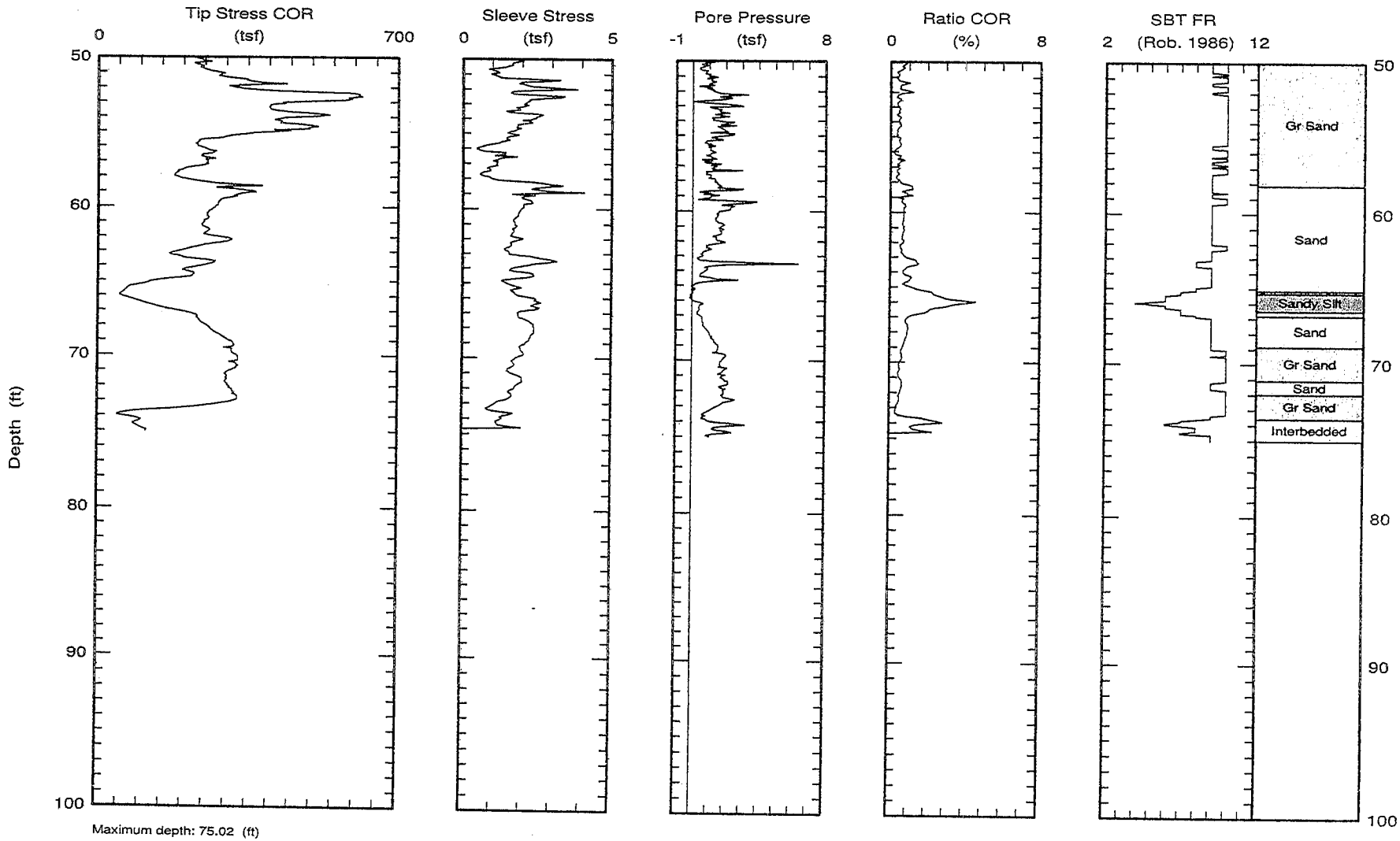
FIGURE A-2.2a

Kehoe Testing & Engineering
Office: (714) 901-7270
Fax: (714) 901-7289
skehoe@msn.com

CPT Data
30 ton rig

Date: 29/Jun/2006
Test ID: CPT-2
Project: MarinaDelRey

Client: Van Beveren & Butelo Inc.
Job Site: Woodfin Suites



Maximum depth: 75.02 (ft)
Page 2 of 2

FIGURE A-2.2b

Via Marina & Tahiti Way
Marina Del Rey,CA

CPT-1

CPT Shear Wave Measurements

Depth (ft)	Travel Distance (ft)	S-Wave Arrival (msec)	S-Wave Velocity from Surface (ft/sec)	Interval S-Wave Velocity (ft/sec)
50.00	50.25	78.84	637.36	
75.10	75.27	101.95	738.27	1082.51

CPT-2

CPT Shear Wave Measurements

Depth (ft)	Travel Distance (ft)	S-Wave Arrival (msec)	S-Wave Velocity from Surface (ft/sec)	Interval S-Wave Velocity (ft/sec)
50.06	50.31	78.84	638.12	
75.03	75.20	105.79	710.81	923.46

Shear Wave Source Offset = 5 ft

S-Wave Velocity from Surface = Travel Distance/S-Wave Arrival
Interval S-Wave Velocity = (Travel Dist2-Travel Dist1)/(Time2-Time1)

FIGURE A-2.3a

Van Beveren & Butelo Inc. CPT-1

Kehoe Testing and Engineering

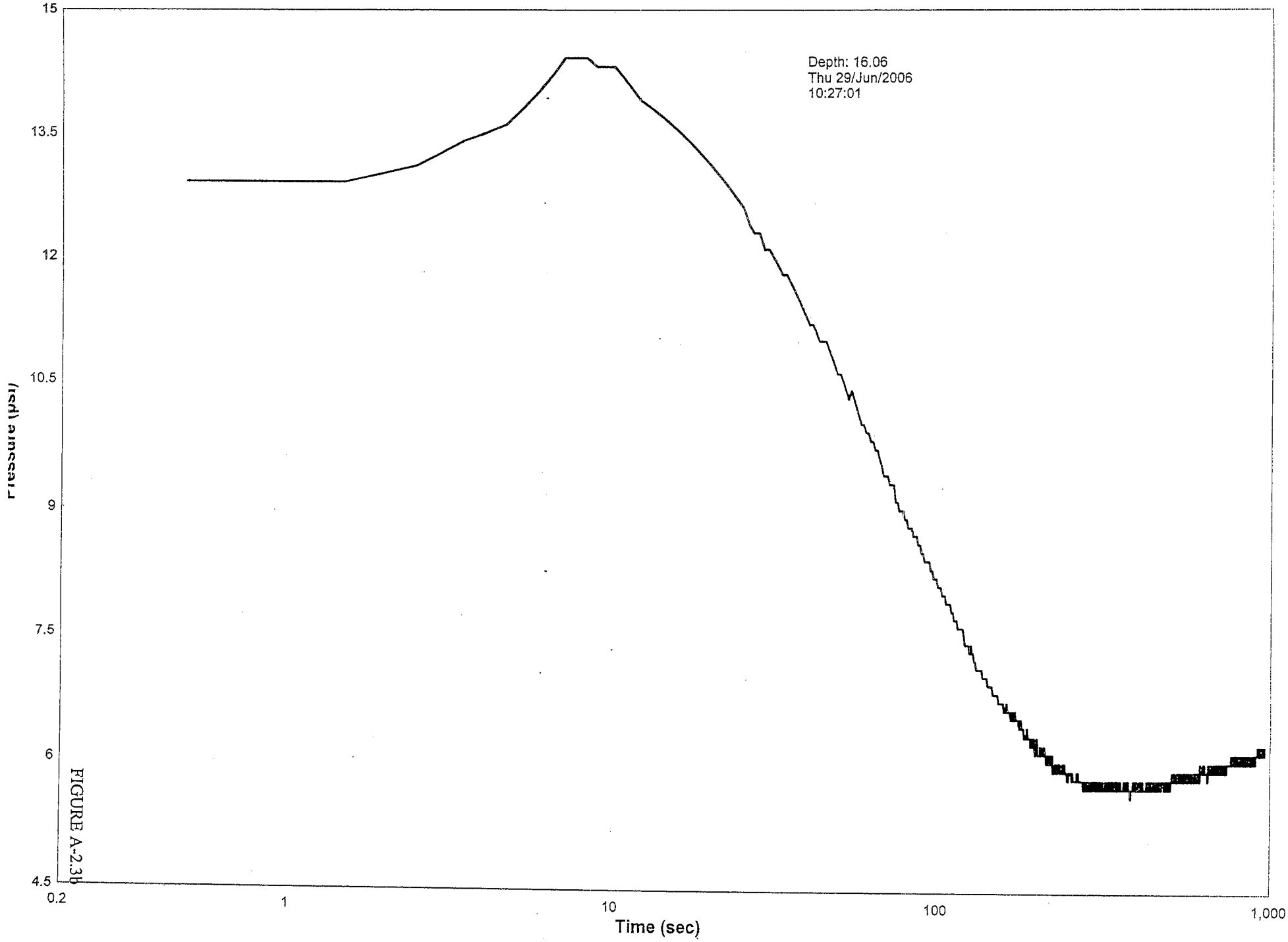


FIGURE A-2.3b

Van Beveren & Butelo Inc. CPT-2

Kehoe Testing and Engineering

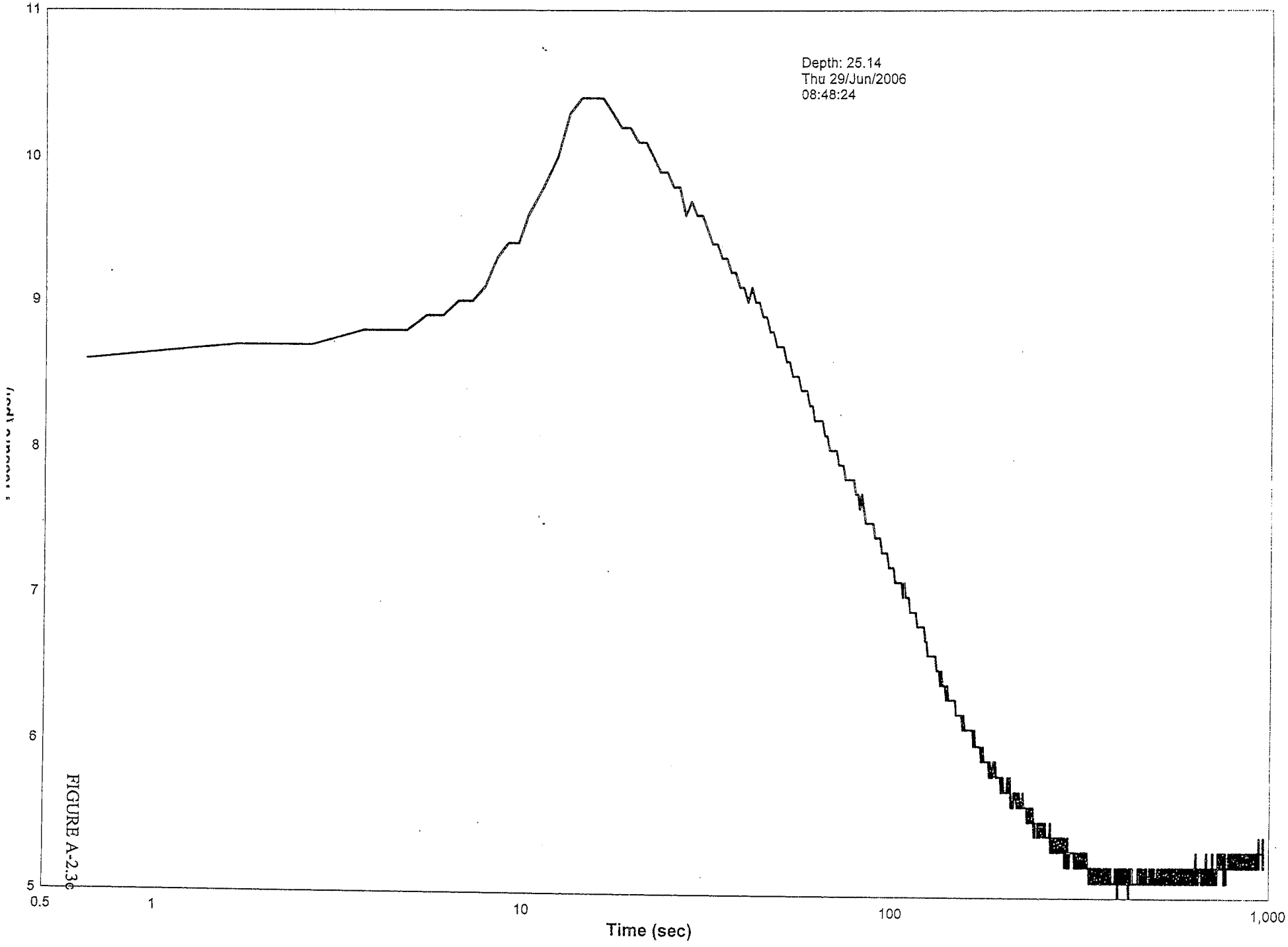


FIGURE A-2.3c

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 Sieve Size)	CLEAN SANDS (Little or no fines)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amount of fines)	SM	Silty sands, sand - silt mixtures
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)		ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts and with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			PT	Peat and other highly organic soils.

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

SILT OR CLAY	SAND			GRAVEL		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

No.200 No.40 No.10 No.4 3/4 in. 3 in. 12 in.

U.S. STANDARD SIEVE SIZE

UNIFIED SOIL CLASSIFICATION SYSTEM

SAMPLE LEGEND:

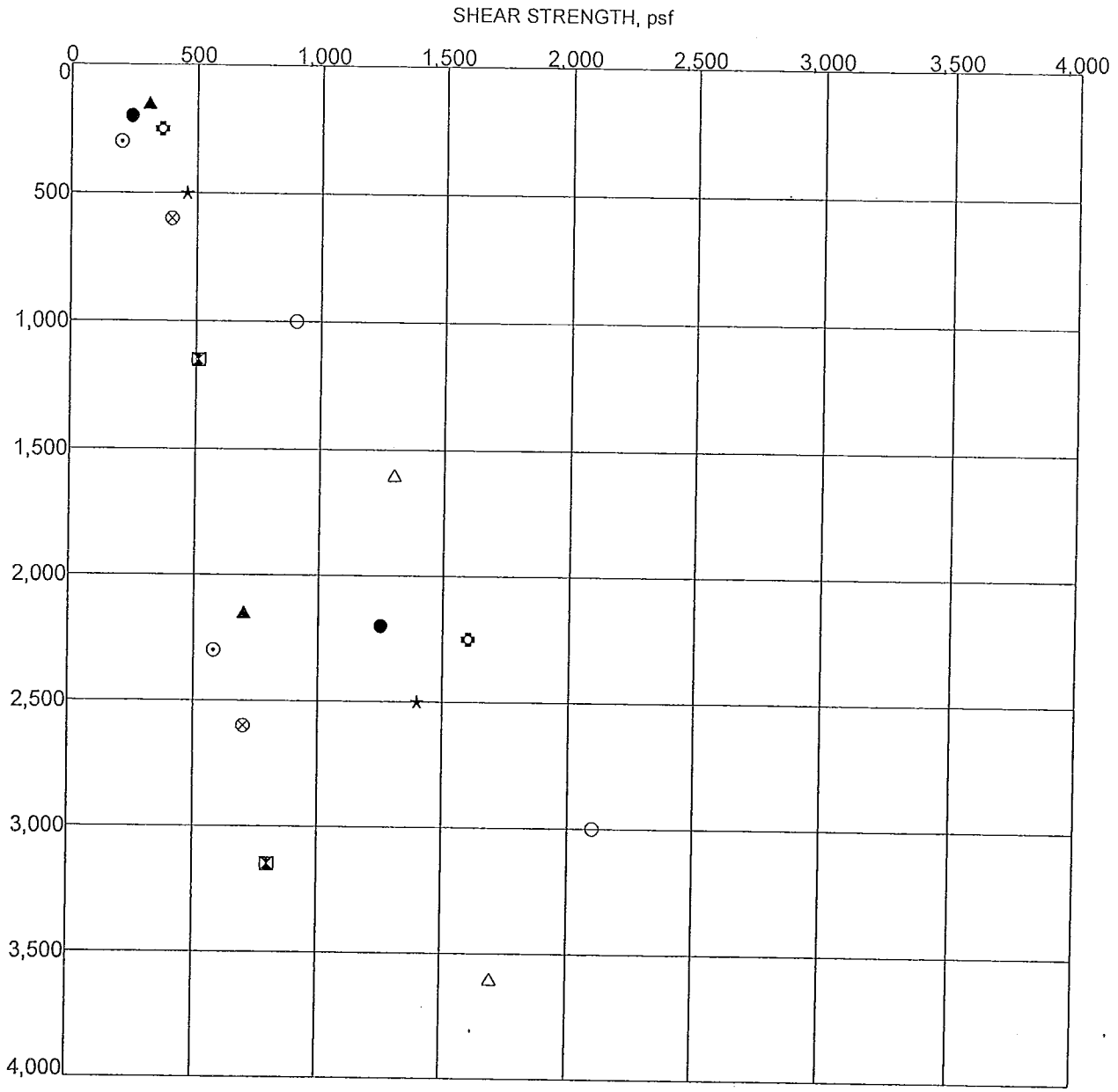
- Undisturbed Sample (Modified California Sampler)
- No Sample Recovery
- SPT Sample (Split Spoon Test)

Reference: The Unified Soil Classification System, Corps of Engineers, U.S. Army Technical Memorandum No. 3-357, Vol. 1, March, 1953 (Revised April, 1960)

VAN BEVEREN & BUTELO, INC.

FIGURE A-3

SOIL/SAMPLE KEY 04-012.3.GPJ VB B.GDT 10/10/06



NOTE: "*" indicates sample was soaked to near saturation prior to testing.

	Specimen Identification	Classification	c	ϕ	
●	Boring 1 at 12½ feet	SILTY CLAY	139	27	*
⊠	Boring 1 at 29 feet	SILTY CLAY	343	8	*
▲	Boring 2 at 10½ feet	SILTY CLAY	281	11	*
★	Boring 2 at 18½ feet	SAND WITH SILTY CLAY	225	25	
⊙	Boring 3 at 8½ feet	SILTY CLAY	143	11	*
✿	Boring 4 at 13½ feet	SAND WITH SILT	205	32	*
○	Boring 4 at 27½ feet	SILTY SAND	300	31	
△	Boring 4 at 36½ feet	CLAY	980	11	
⊗	Boring 5 at 20½ feet	CLAY	310	9	*

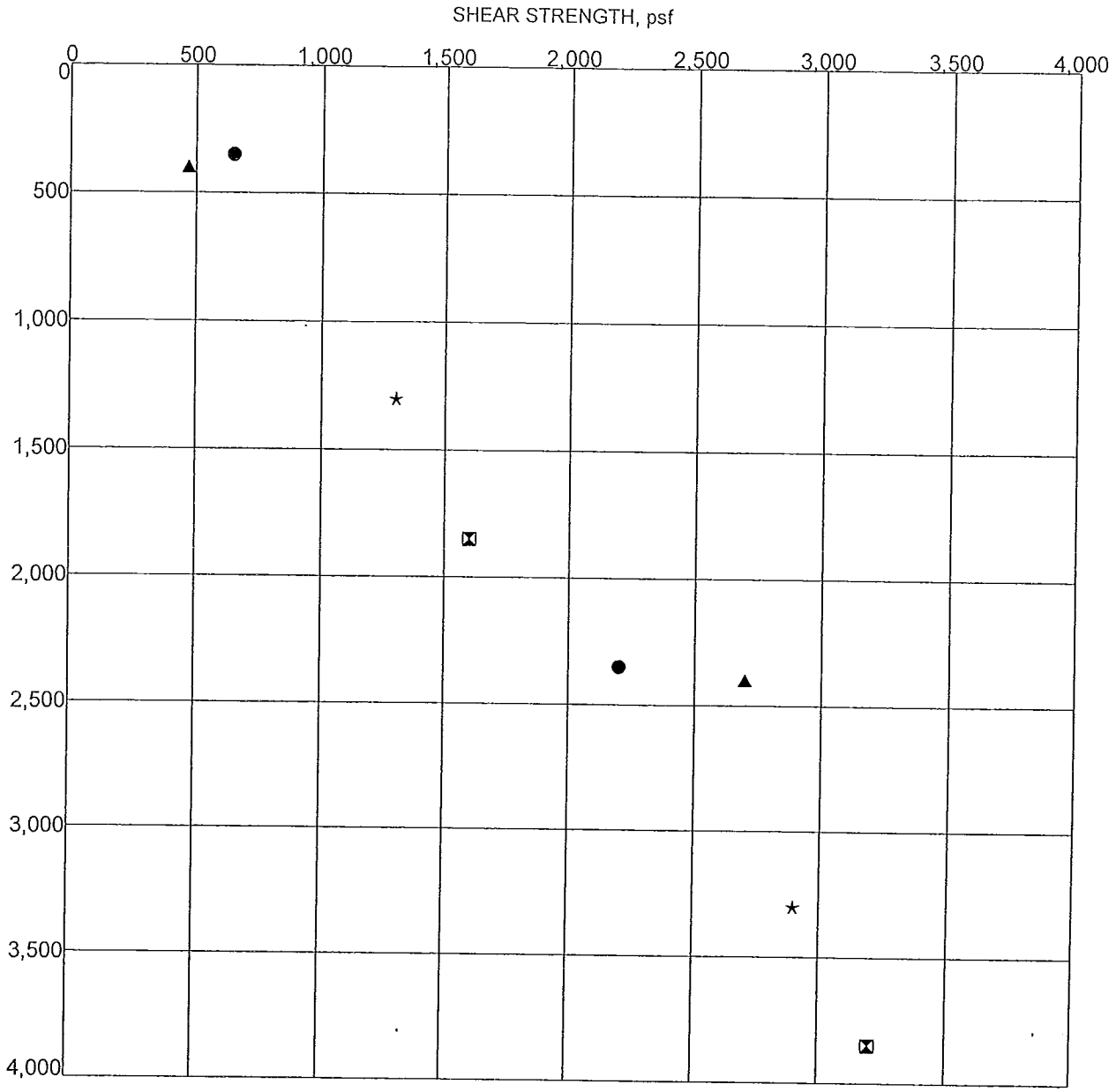
DIRECT SHEAR TEST DATA

ESTUARY DEPOSITS

VAN BEVEREN & BUTELO, INC.

FIGURE A-4.1

DIRECT_SHEAR_4_10_04-012.3.GPJ VB_B.GDT 10/11/06



NOTE: "*" indicates sample was soaked to near saturation prior to testing.

	Specimen Identification	Classification	c	ϕ
●	Boring 1 at 49 feet	SAND	379	38
⊠	Boring 2 at 41½ feet	CLAYEY SAND WITH GRAVEL	120	39
▲	Boring 5 at 40½ feet	SAND WITH GRAVEL	24	48
★	Boring 5 at 65½ feet	SAND WITH SILT AND GRAVEL	260	39

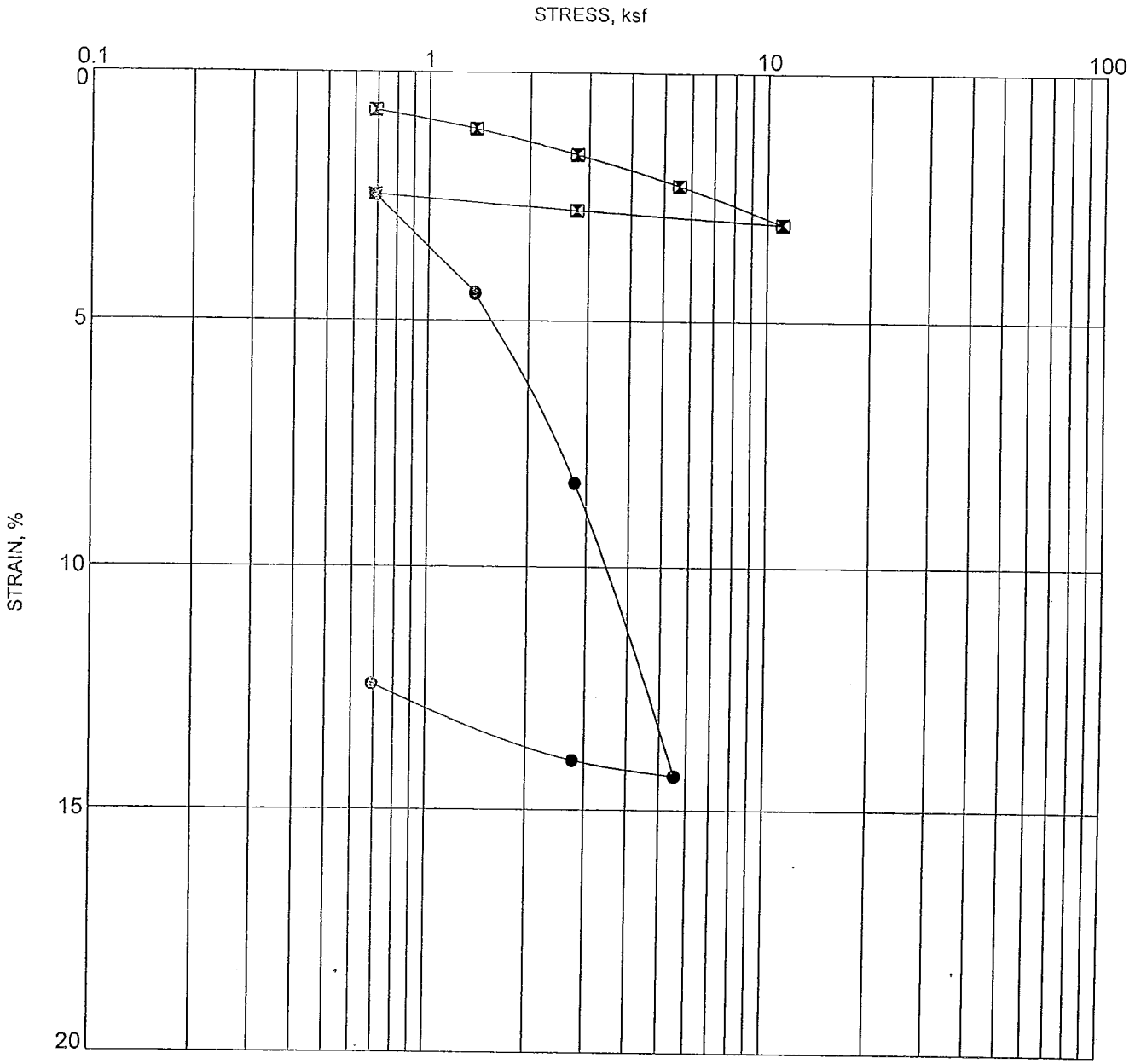
DIRECT SHEAR TEST DATA

DENSE SAND AND GRAVEL

VAN BEVEREN & BUTELO, INC.

FIGURE A-4.2

DIRECT_SHEAR_4_10_04-012.3.GPJ VB_B.GDT 10/11/06



NOTE: Water was added to samples after consolidation under the specified load.

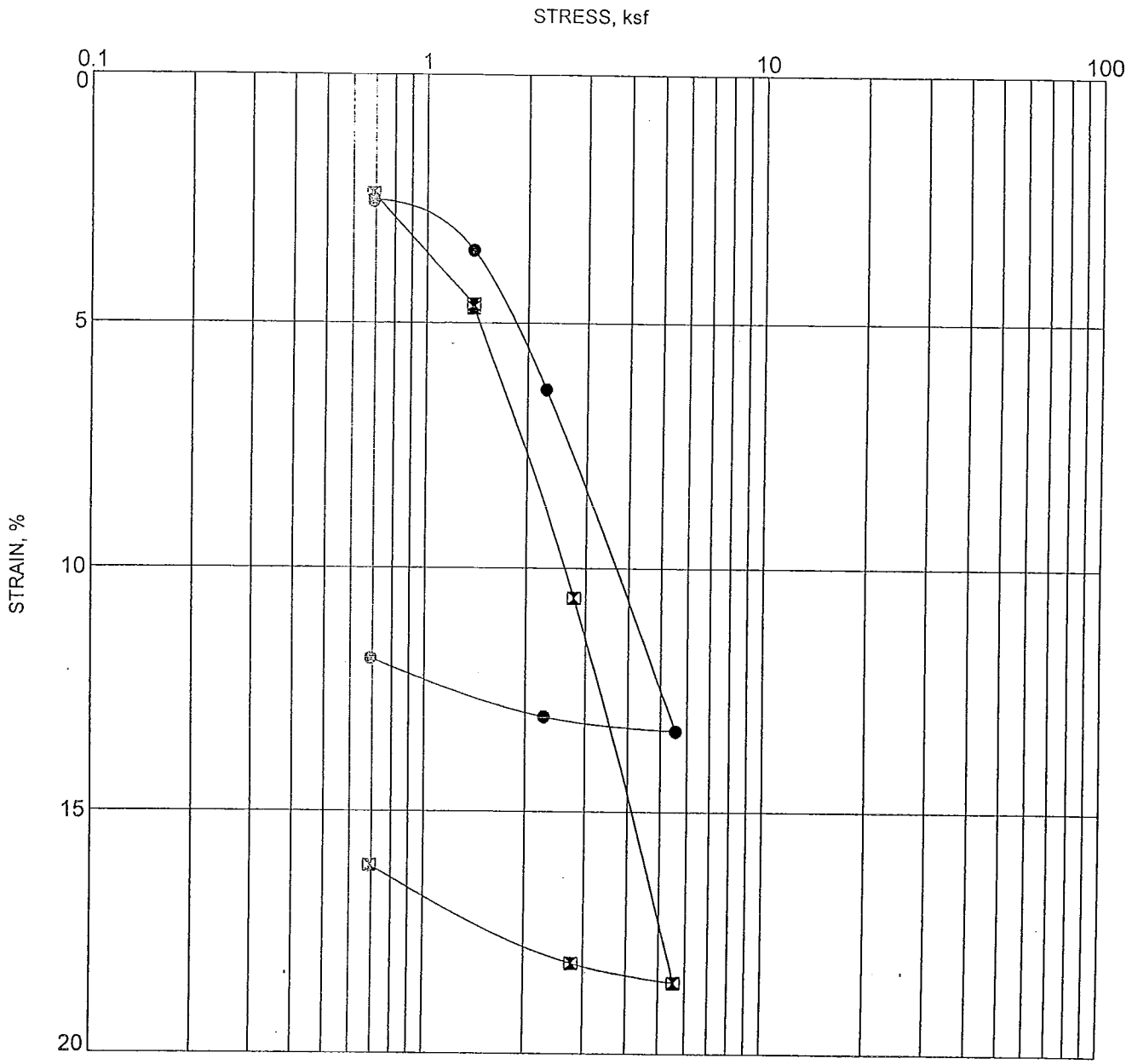
	Specimen Identification	Classification	
●	Boring 1 at 12½ feet	SILTY CLAY	* 1.38 ksf
⊠	Boring 1 at 39½ feet	SILTY SAND	* 0.69 ksf

CONSOLIDATION TEST DATA

VAN BEVEREN & BUTELO, INC.

CONSOL20_VARYINGWATER_04-012.3.GPJ VB_B.GDT 10/10/06

FIGURE A-5.1



NOTE: Water was added to samples after consolidation under the specified load.

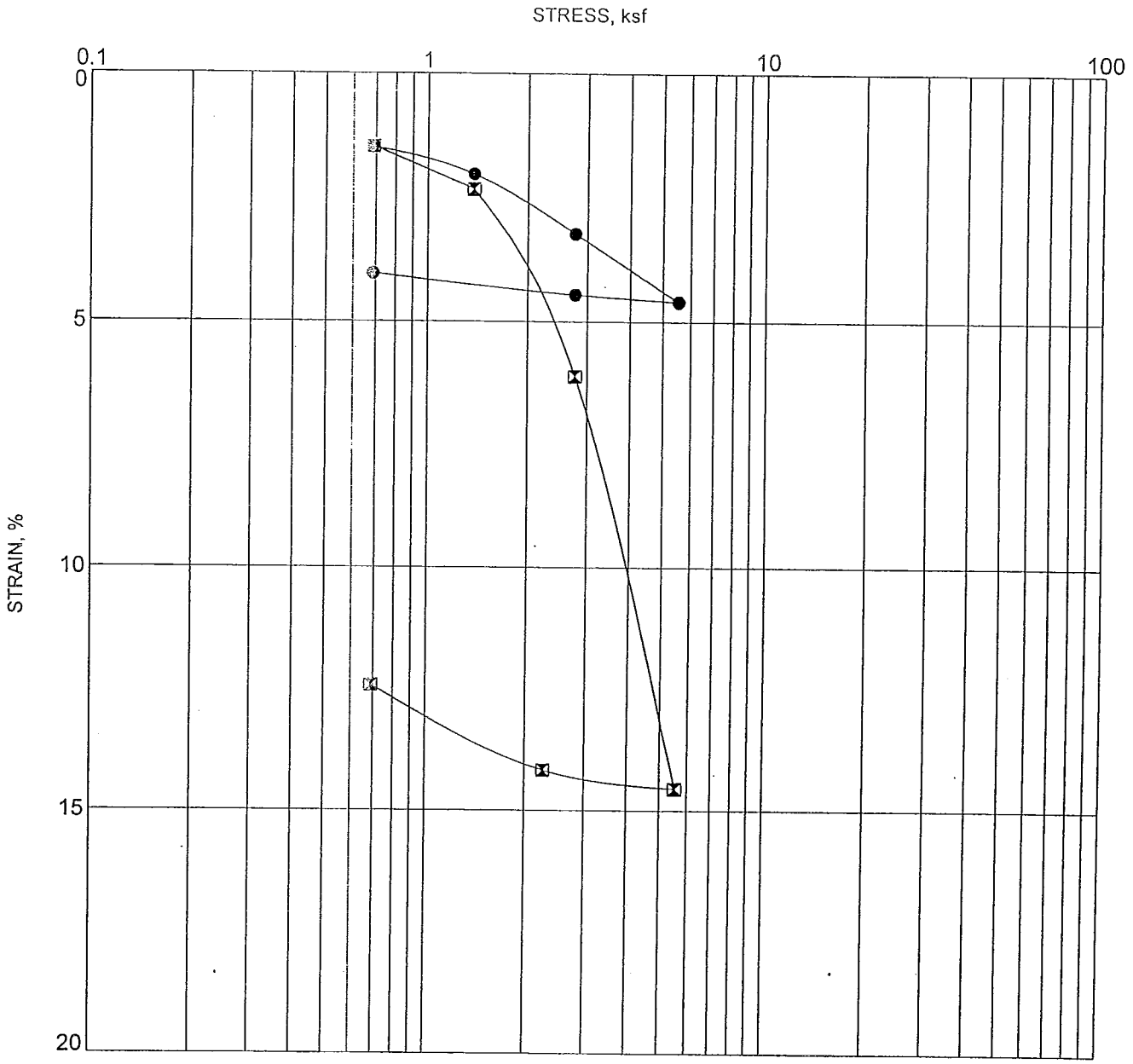
	Specimen Identification	Classification	
●	Boring 2 at 31½ feet	SILTY CLAY	* 0.69 ksf
⊠	Boring 4 at 4½ feet	CLAY	* 1.38 ksf

CONSOLIDATION TEST DATA

CONSOL20_VARYINGWATER_04-012.3.GPJ VB_B.GDT 10/10/06

VAN BEVEREN & BUTELO, INC.

FIGURE A-5.2



NOTE: Water was added to samples after consolidation under the specified load.

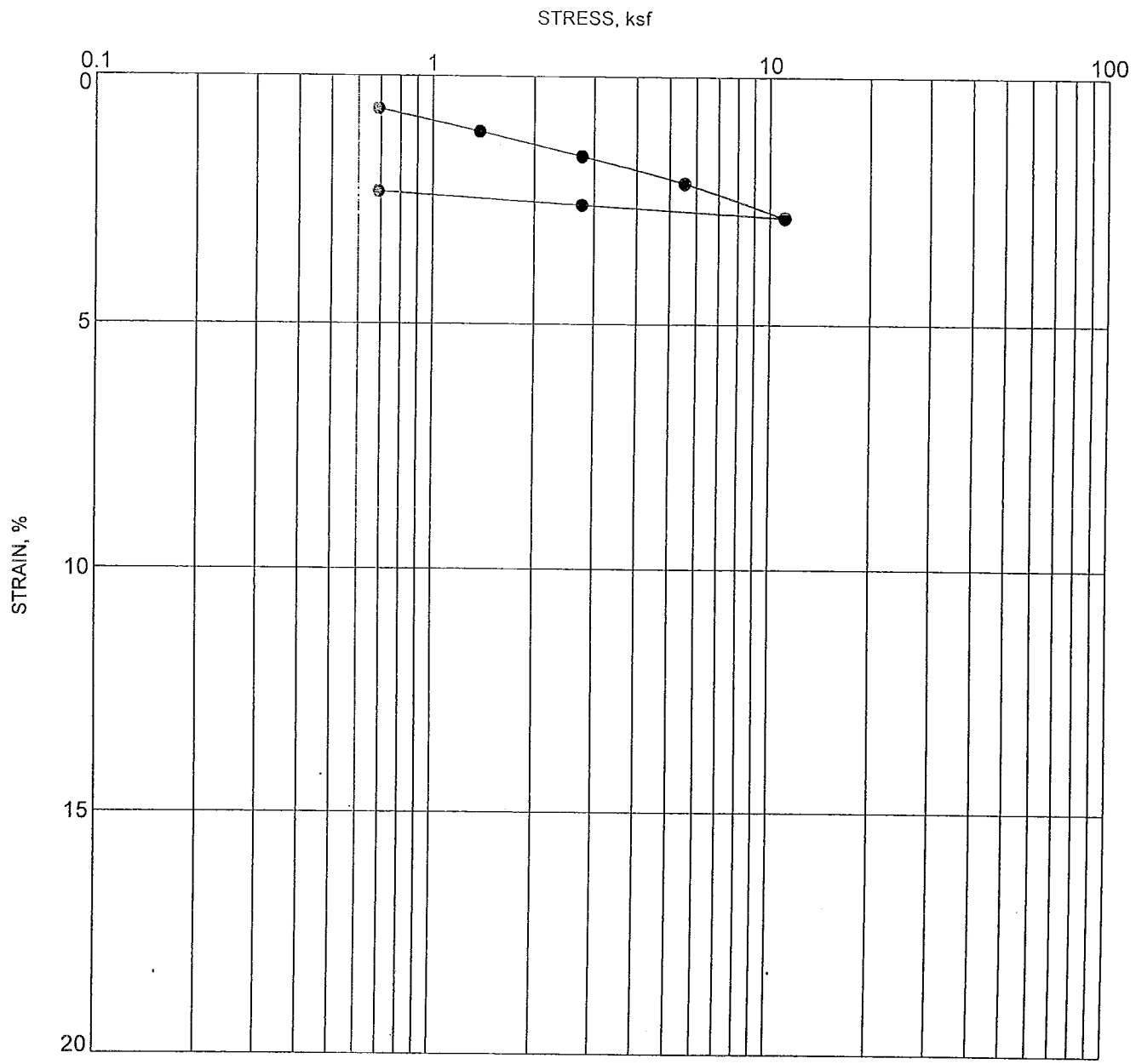
	Specimen Identification	Classification	
●	Boring 4 at 27½ feet	SILTY SAND	* 0.69 ksf
⊠	Boring 5 at 20½ feet	CLAY	* 1.38 ksf

CONSOLIDATION TEST DATA

CONSOL20 VARYINGWATER 04-012.3.GPJ VB B.GDT 10/10/06

VAN BEVEREN & BUTELO, INC.

FIGURE A-5.3



NOTE: Samples tested at field moisture content

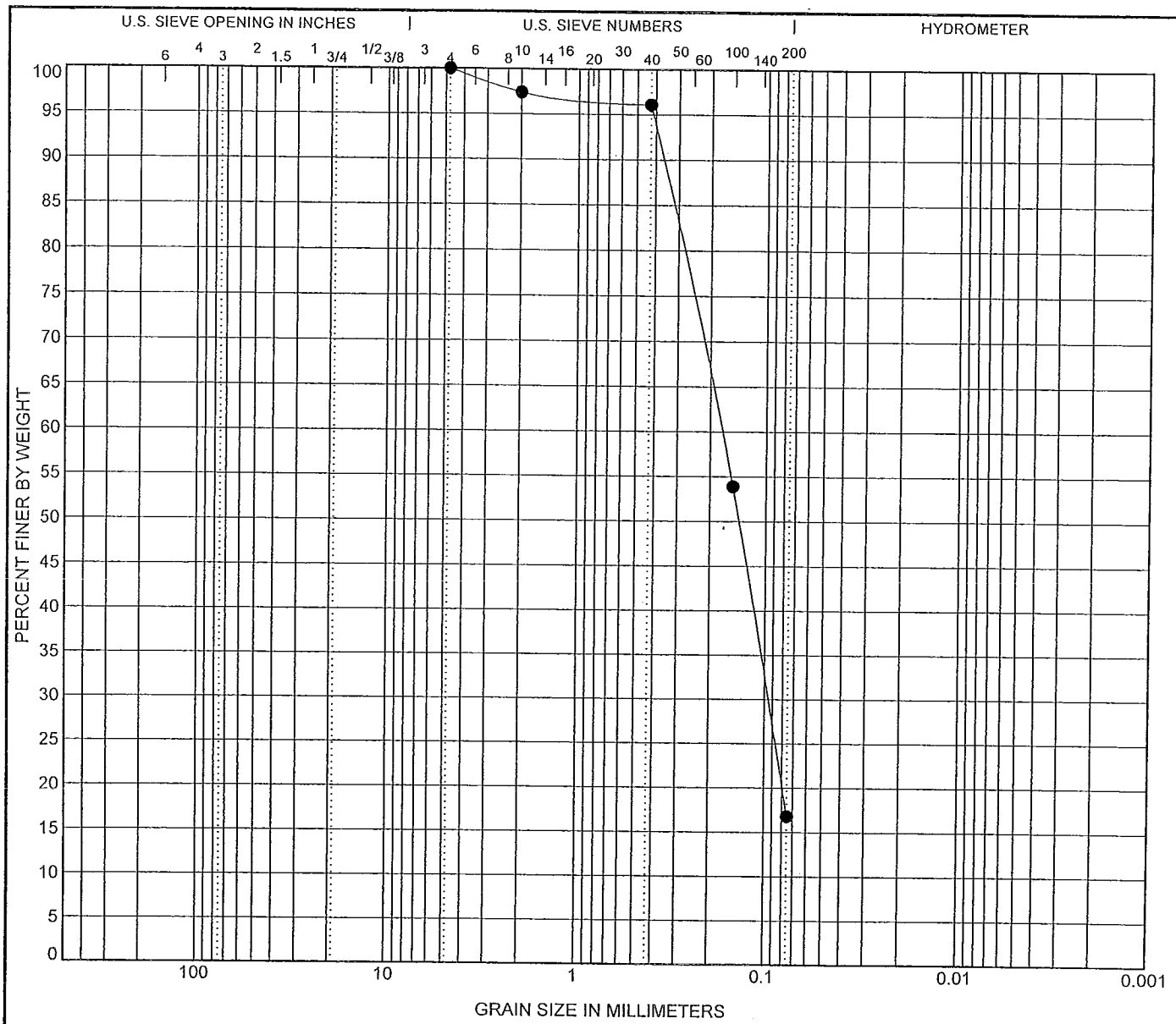
	Specimen Identification	Classification
●	Boring 5 at 50½ feet	SAND WITH GRAVEL

CONSOLIDATION TEST DATA

CONSOL20_VARYINGWATER_04-012.3.GPJ VB_B.GDT 10/10/06

VAN BEVEREN & BUTELO, INC.

FIGURE A-5.4



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

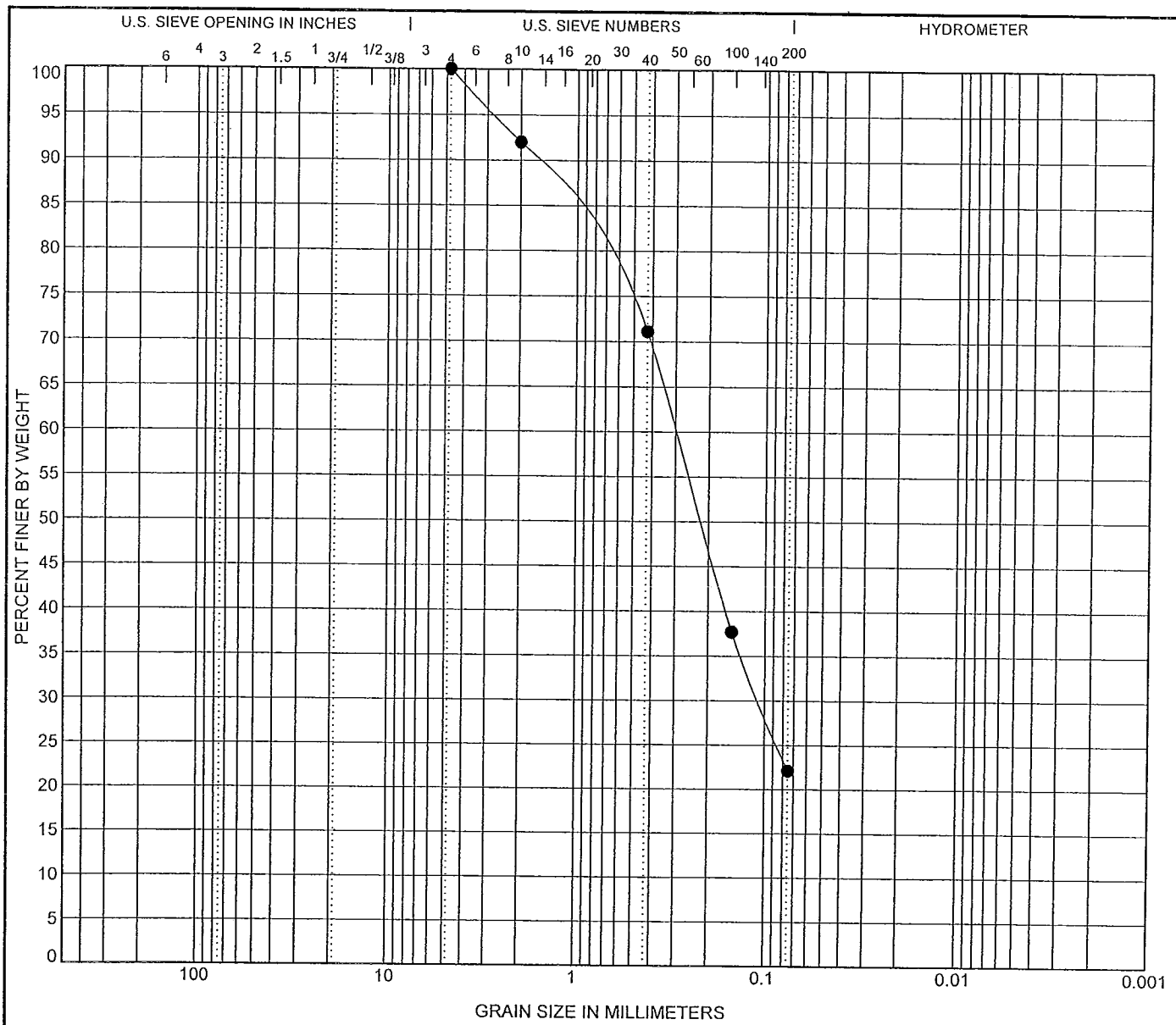
	Specimen Identification	Classification
●	**Boring 1 at 18½ feet**	**SILTY SAND**

GRAIN SIZE DISTRIBUTION TEST DATA

GRAIN_SIZE 04-012.3.GPJ VB_B.GDT 10/10/06

VAN BEVEREN & BUTELO, INC.

FIGURE A-6.1



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

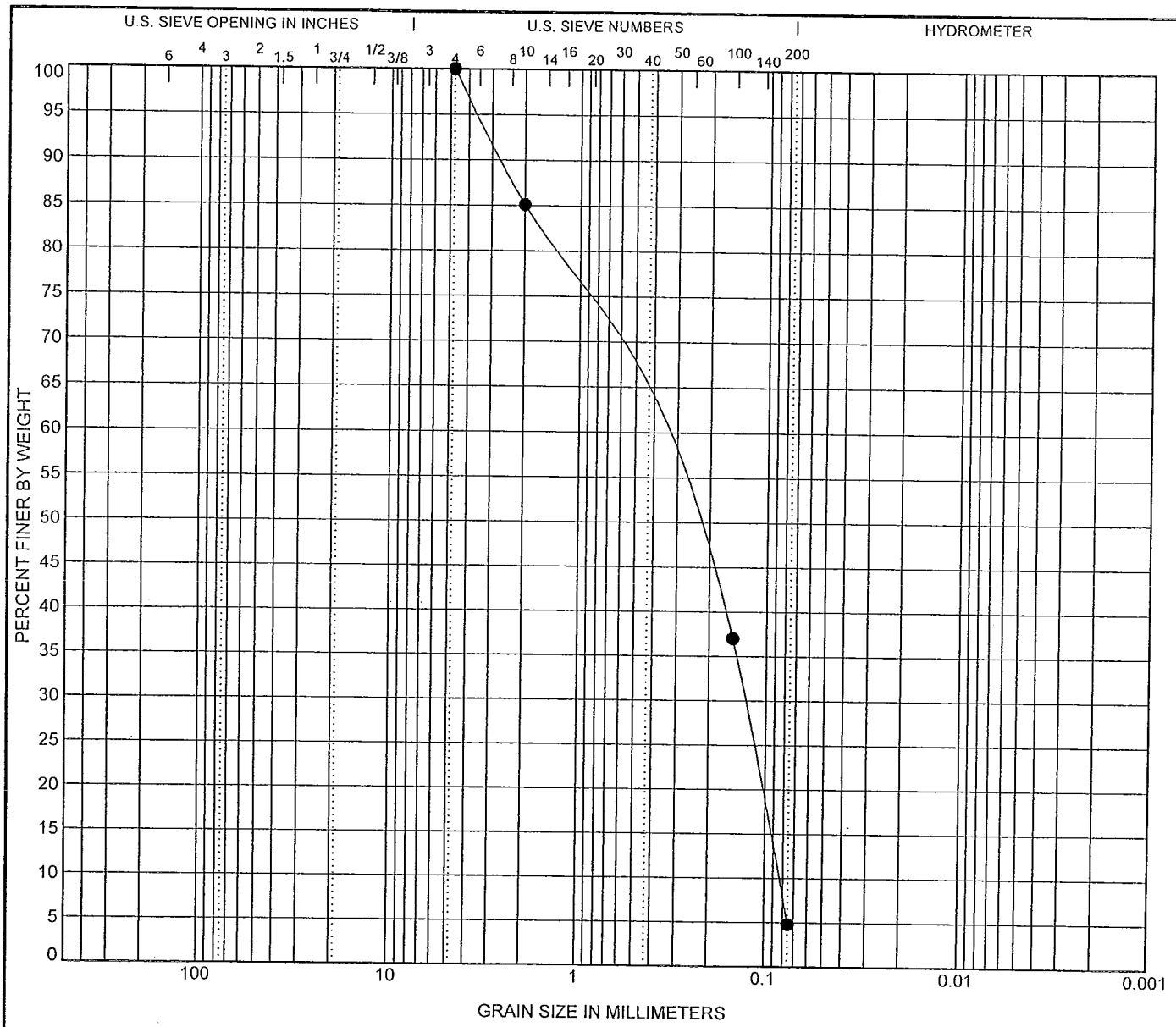
	Specimen Identification	Classification
●	Boring 1 at 34½ feet	SILTY SAND

GRAIN SIZE DISTRIBUTION TEST DATA

GRAIN_SIZE 04-012.3.GPJ VB_B.GDT 10/10/06

VAN BEVEREN & BUTELO, INC.

FIGURE A-6.2



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

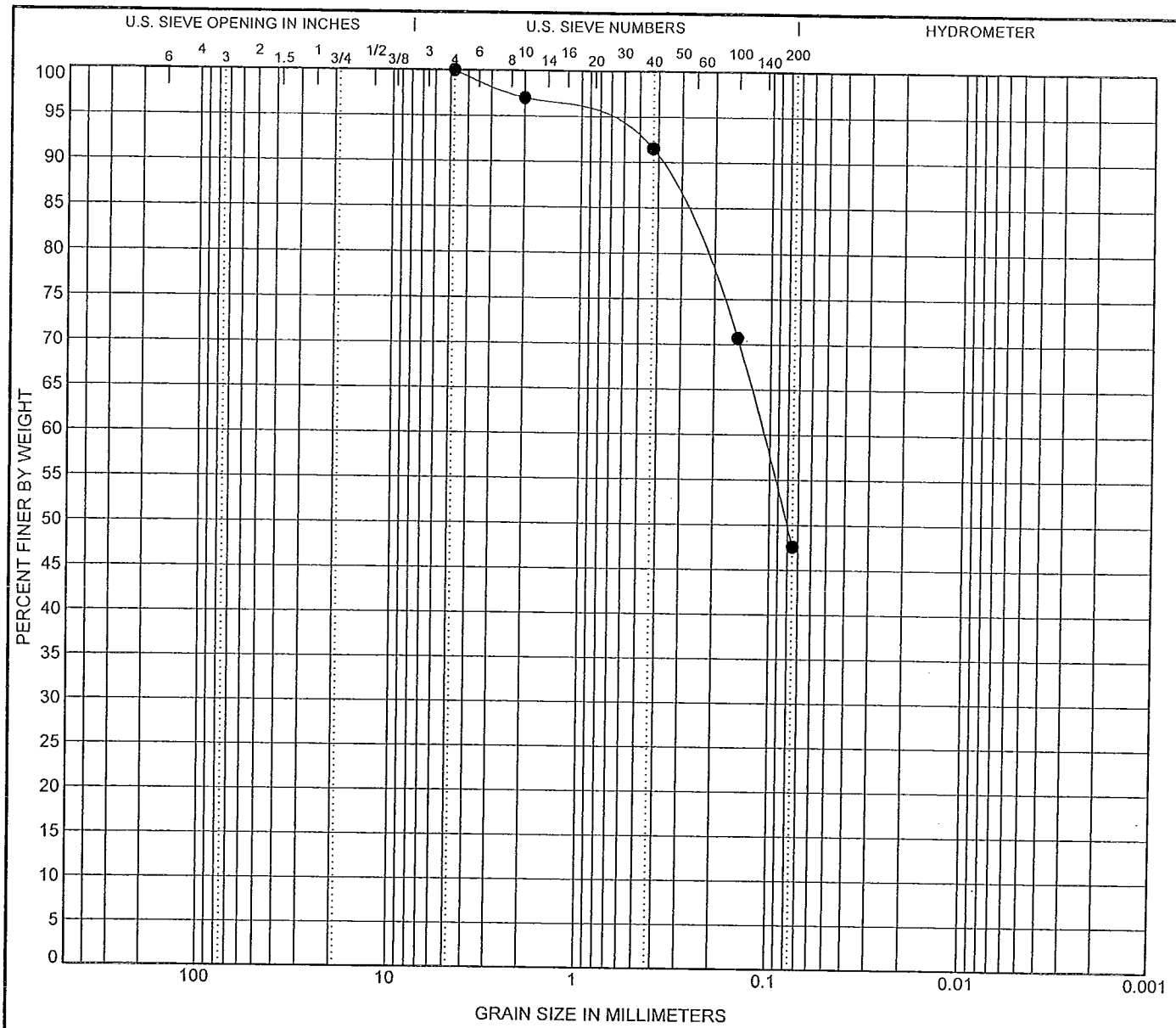
	Specimen Identification	Classification
●	Boring 2 at 19½ feet	SAND WITH SILTY CLAY

GRAIN SIZE DISTRIBUTION TEST DATA

GRAIN_SIZE 04-012.3.GPJ VB_B.GDT 10/10/06

VAN BEVEREN & BUTELO, INC.

FIGURE A-6.3



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

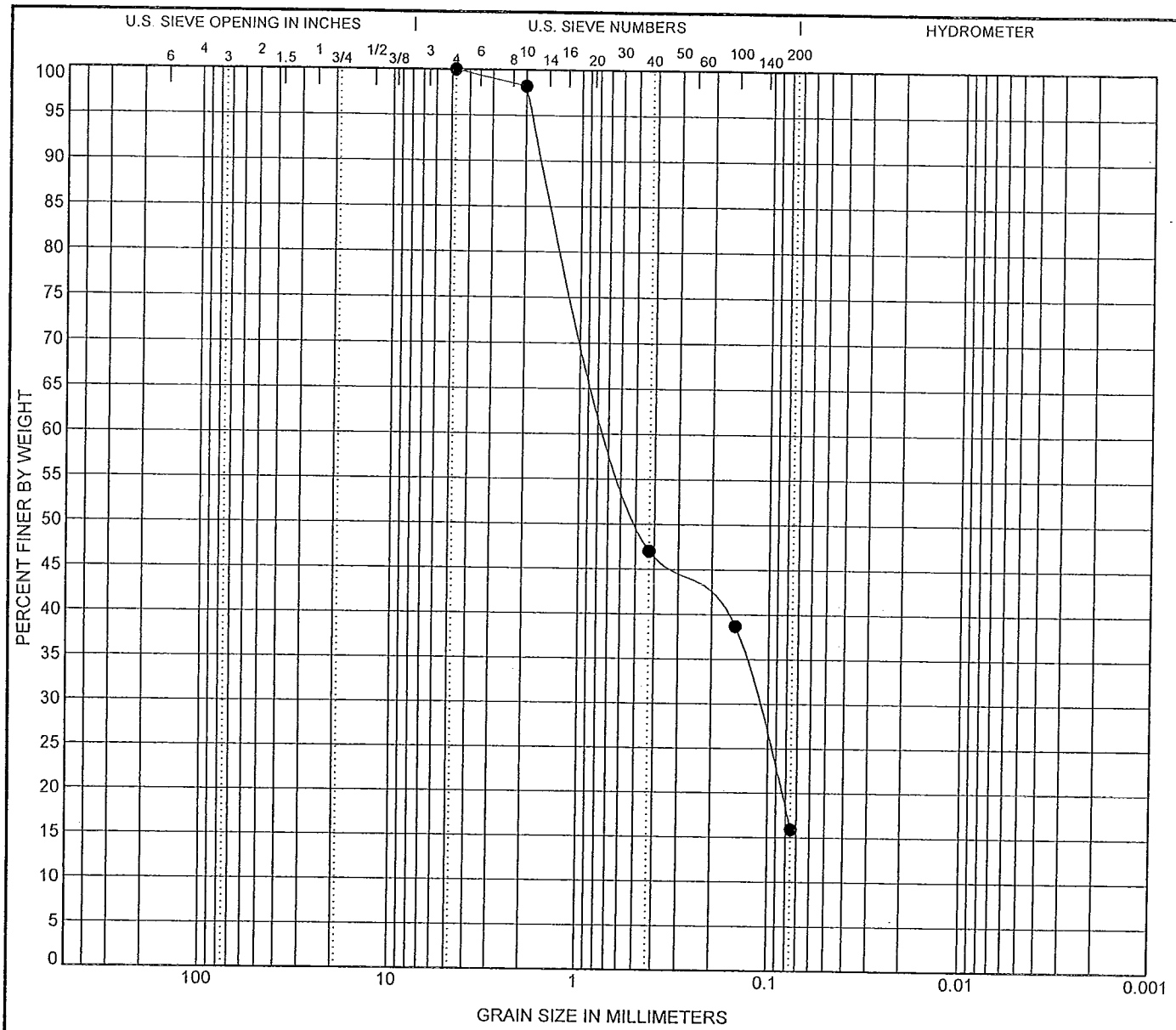
	Specimen Identification	Classification
●	**Boring 2 at 36 feet**	**CLAYEY SAND**

GRAIN SIZE DISTRIBUTION TEST DATA

GRAIN_SIZE 04-012.3.GPJ VB_B.GDT 10/10/06

VAN BEVEREN & BUTELO, INC.

FIGURE A-6.4



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

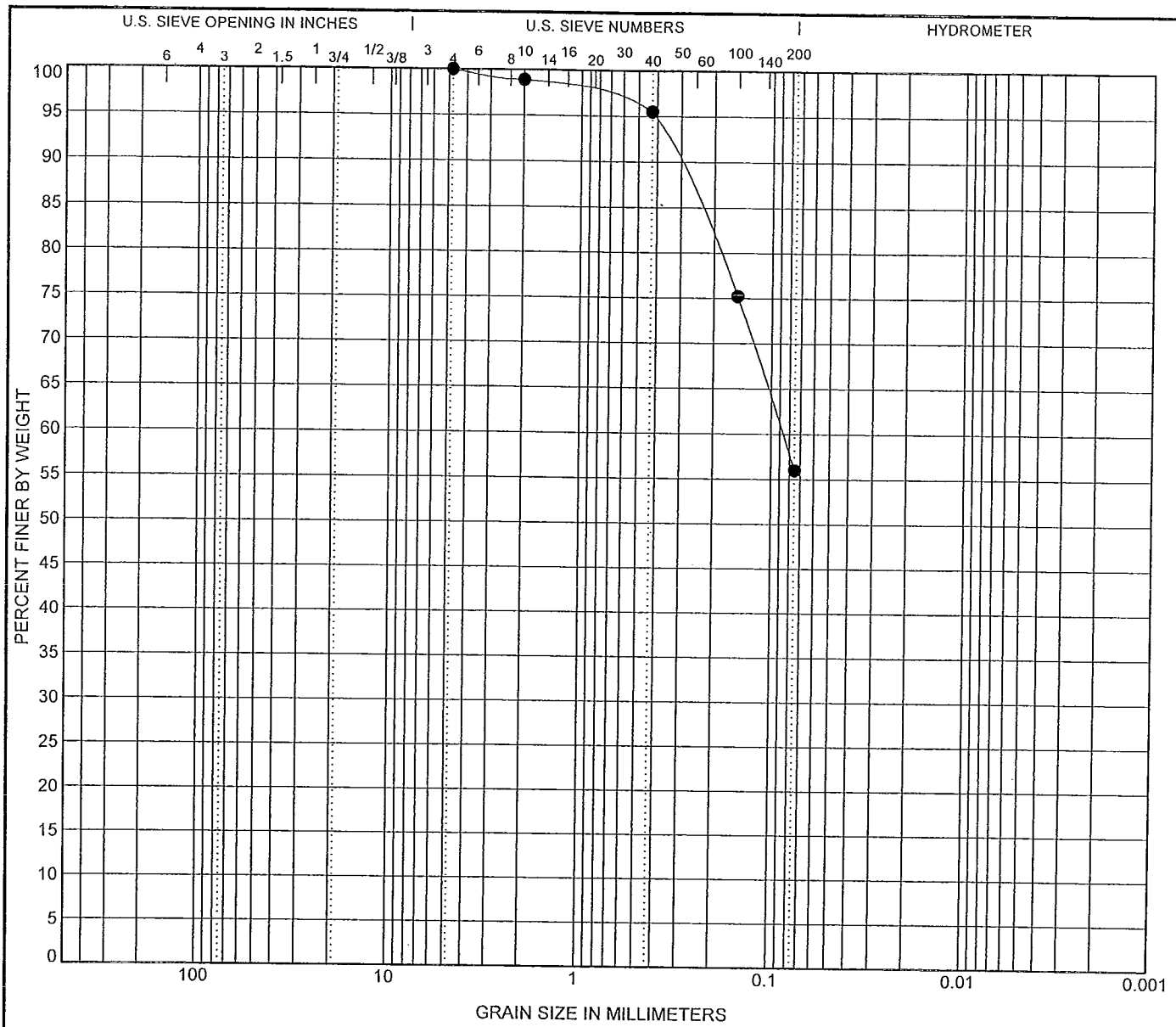
	Specimen Identification	Classification
●	Boring 2 at 66½ feet	SILTY SAND WITH GRAVEL

GRAIN SIZE DISTRIBUTION TEST DATA

GRAIN_SIZE 04-012.3.GPJ VB_B.GDT 10/10/06

VAN BEVEREN & BUTELO, INC.

FIGURE A-6.5



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

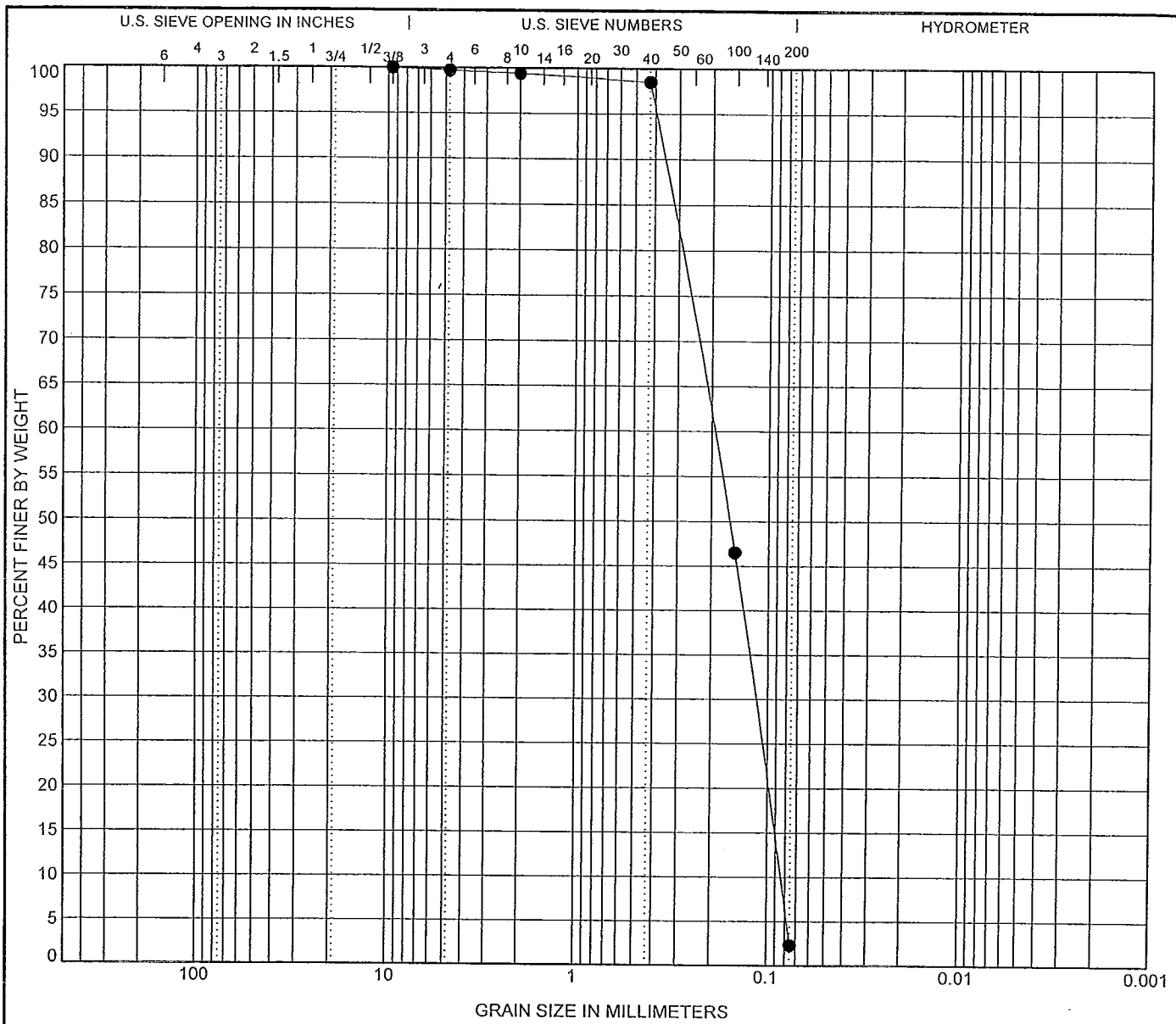
	Specimen Identification	Classification
●	Boring 3 at 34½ feet	SILTY CLAY

GRAIN SIZE DISTRIBUTION TEST DATA

GRAIN_SIZE 04-012.3.GPJ VB_B.GDT 10/10/06

VAN BEVEREN & BUTELO, INC.

FIGURE A-6.6



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

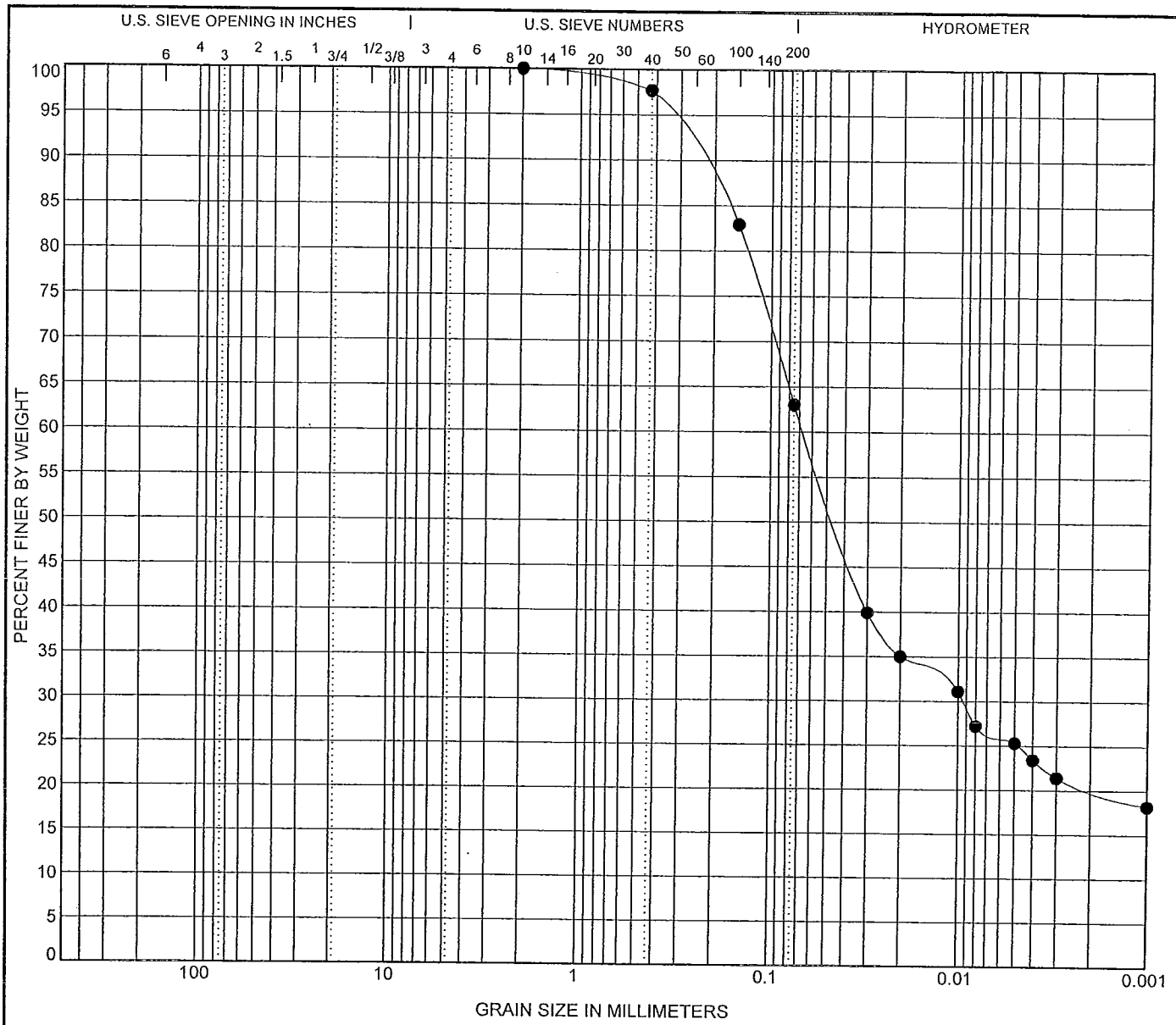
	Specimen Identification	Classification
●	**Boring 4 at 9½ feet**	**SAND**

GRAIN SIZE DISTRIBUTION TEST DATA

VAN BEVEREN & BUTELO, INC.

GRAIN_SIZE 04-012.3.GPJ VB_B.GDT 10/10/06

FIGURE A-6.7



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

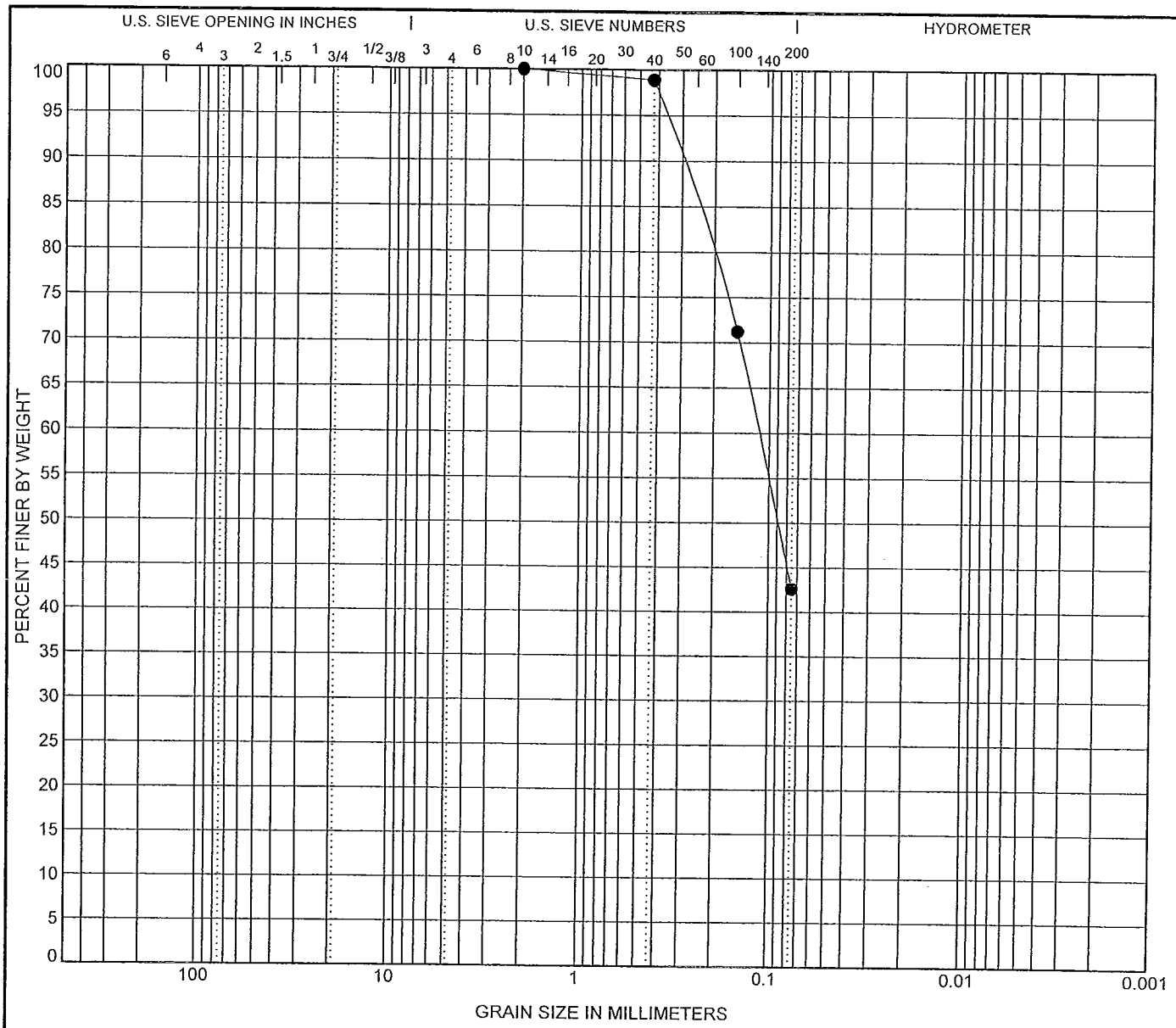
	Specimen Identification	Classification
●	**Boring 4 at 31 feet**	**SILTY CLAY**

GRAIN SIZE DISTRIBUTION TEST DATA

GRAIN_SIZE 04-012.3.GPJ VB_B.GDT 10/10/06

VAN BEVEREN & BUTELO, INC.

FIGURE A-6.8



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

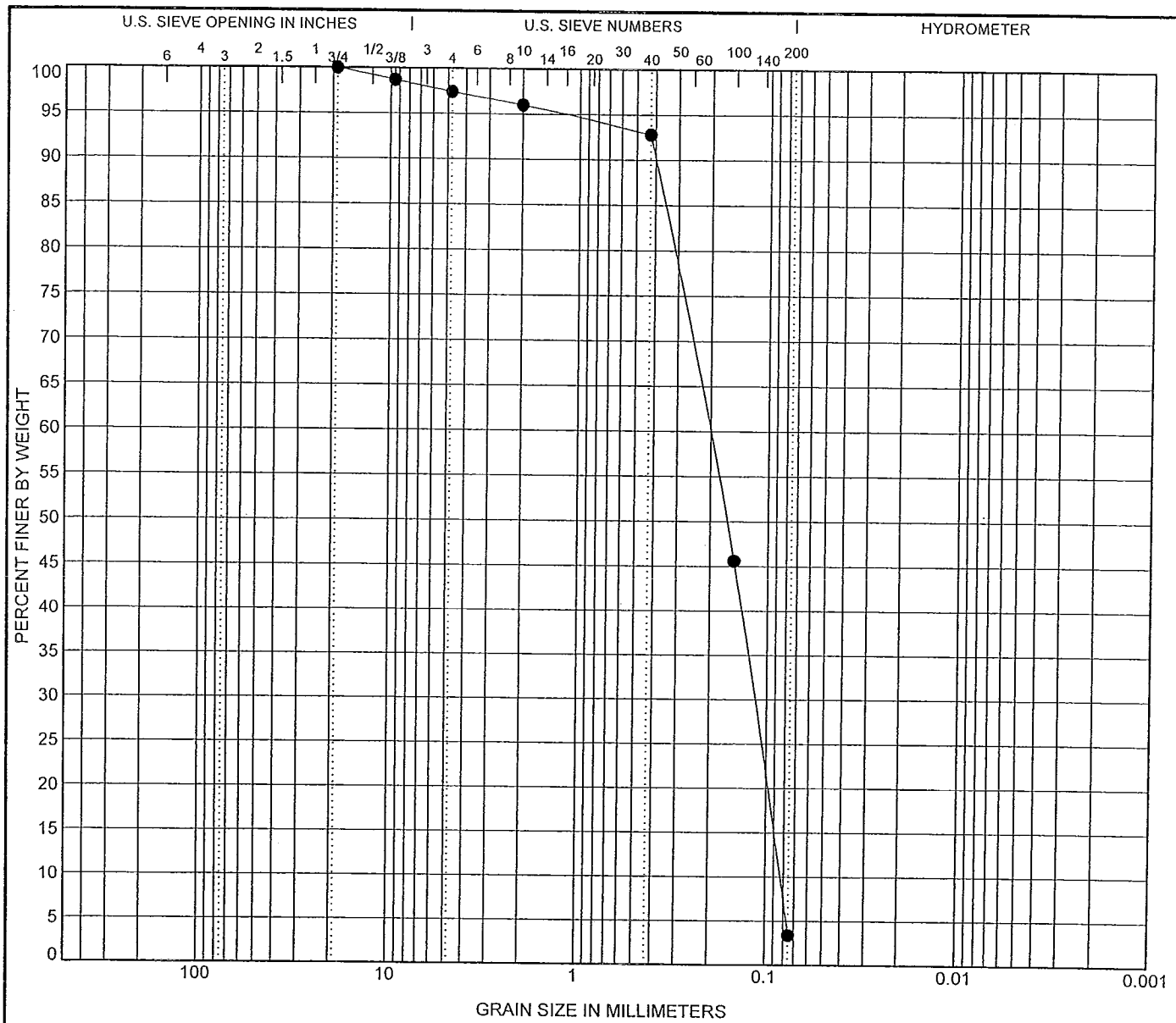
	Specimen Identification	Classification
●	**Boring 5 at 6½ feet**	**CLAYEY SAND**

GRAIN SIZE DISTRIBUTION TEST DATA

GRAIN_SIZE 04-012.3.GPJ VB_B.GDT 10/10/06

VAN BEVEREN & BUTELO, INC.

FIGURE A-6.9



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

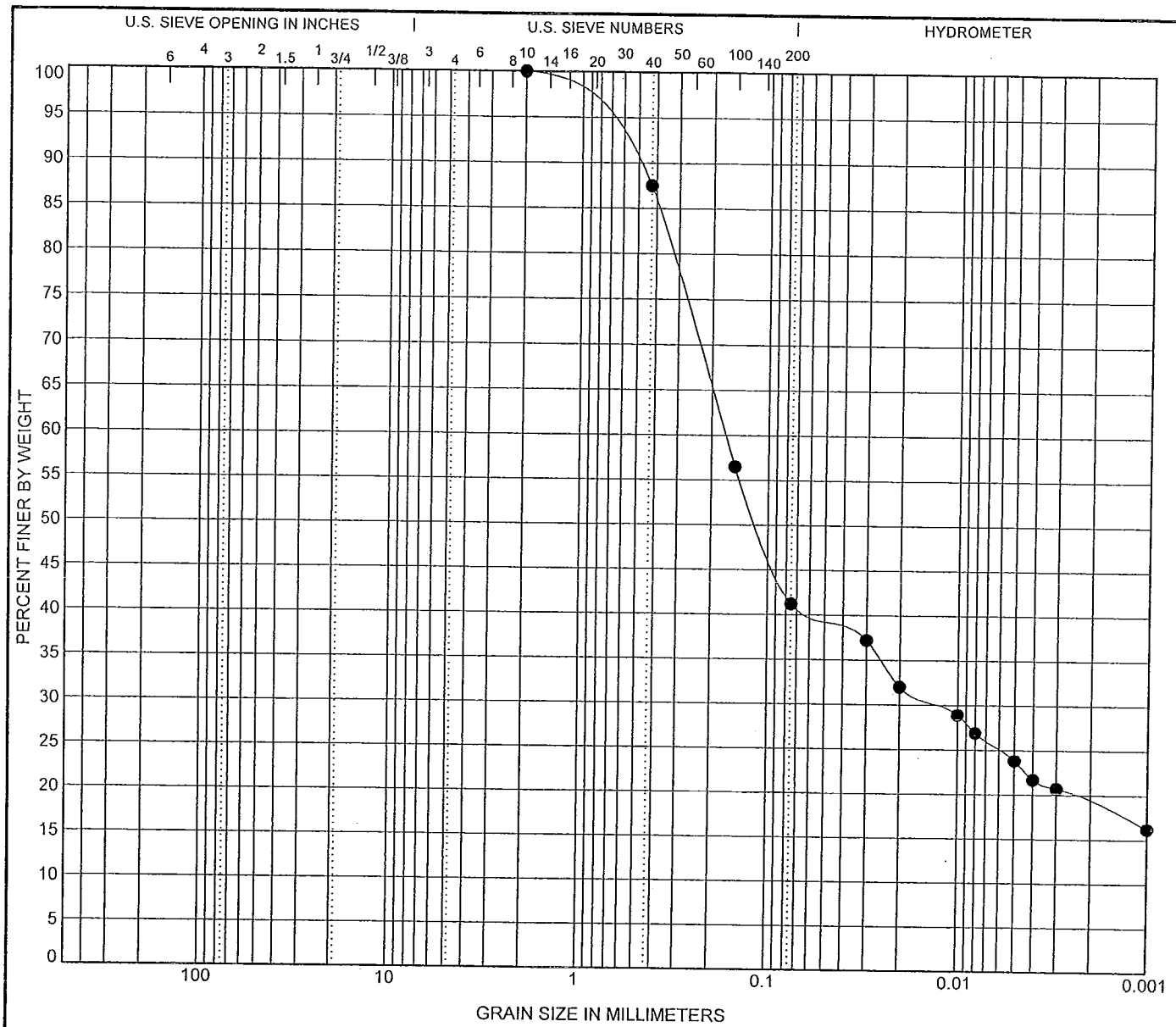
	Specimen Identification	Classification
●	**Boring 5 at 11½ feet**	**SAND**

GRAIN SIZE DISTRIBUTION TEST DATA

VAN BEVEREN & BUTELO, INC.

FIGURE A-6.10

GRAIN_SIZE 04-012.3.GPJ VB_B.GDT 10/10/06



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

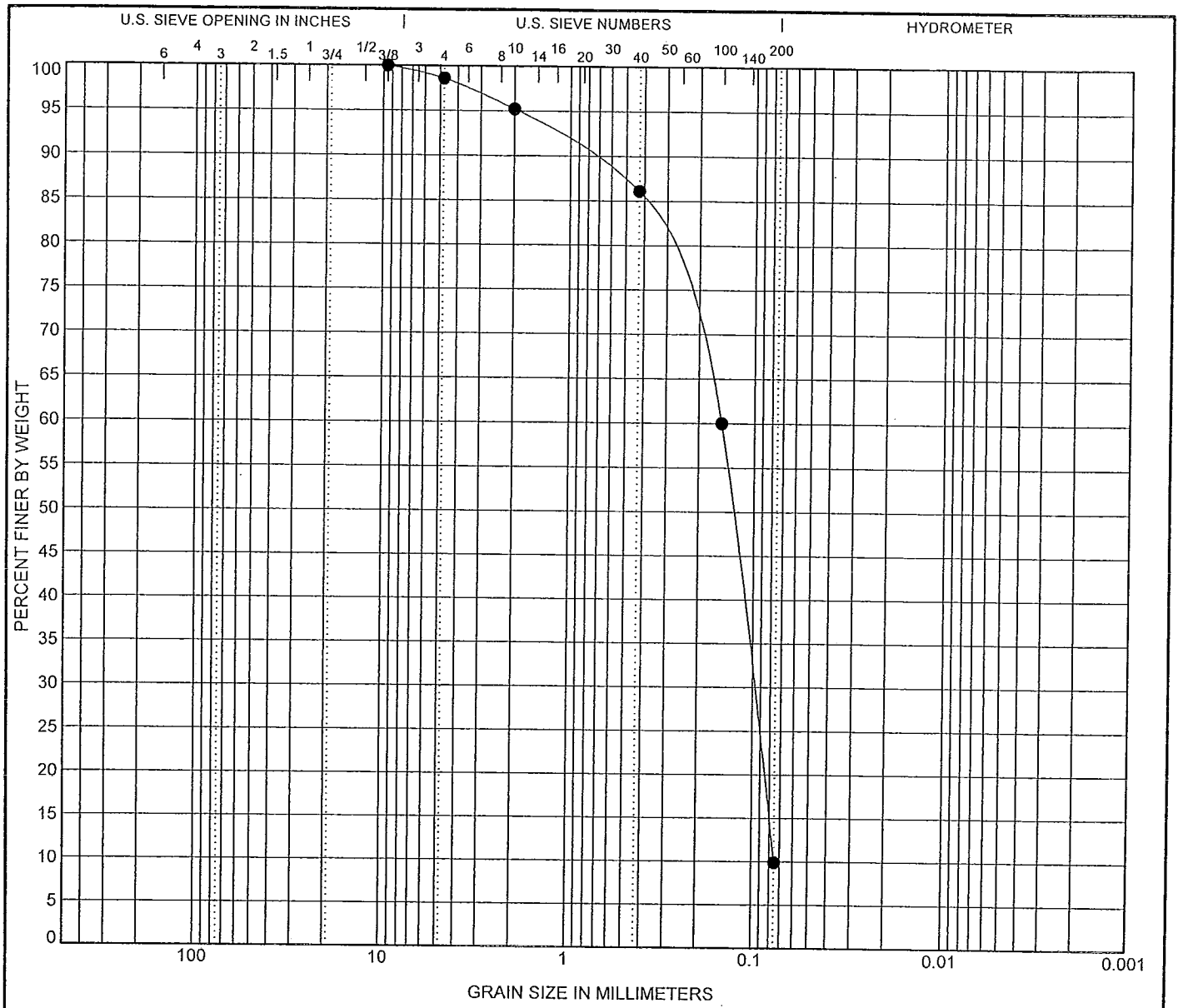
	Specimen Identification	Classification
●	Boring 5 at 25	CLAYEY SAND

GRAIN SIZE DISTRIBUTION TEST DATA

GRAIN_SIZE 04-012.3.GPJ VB_B.GDT 10/10/06

VAN BEVEREN & BUTELO, INC.

FIGURE A-6.11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

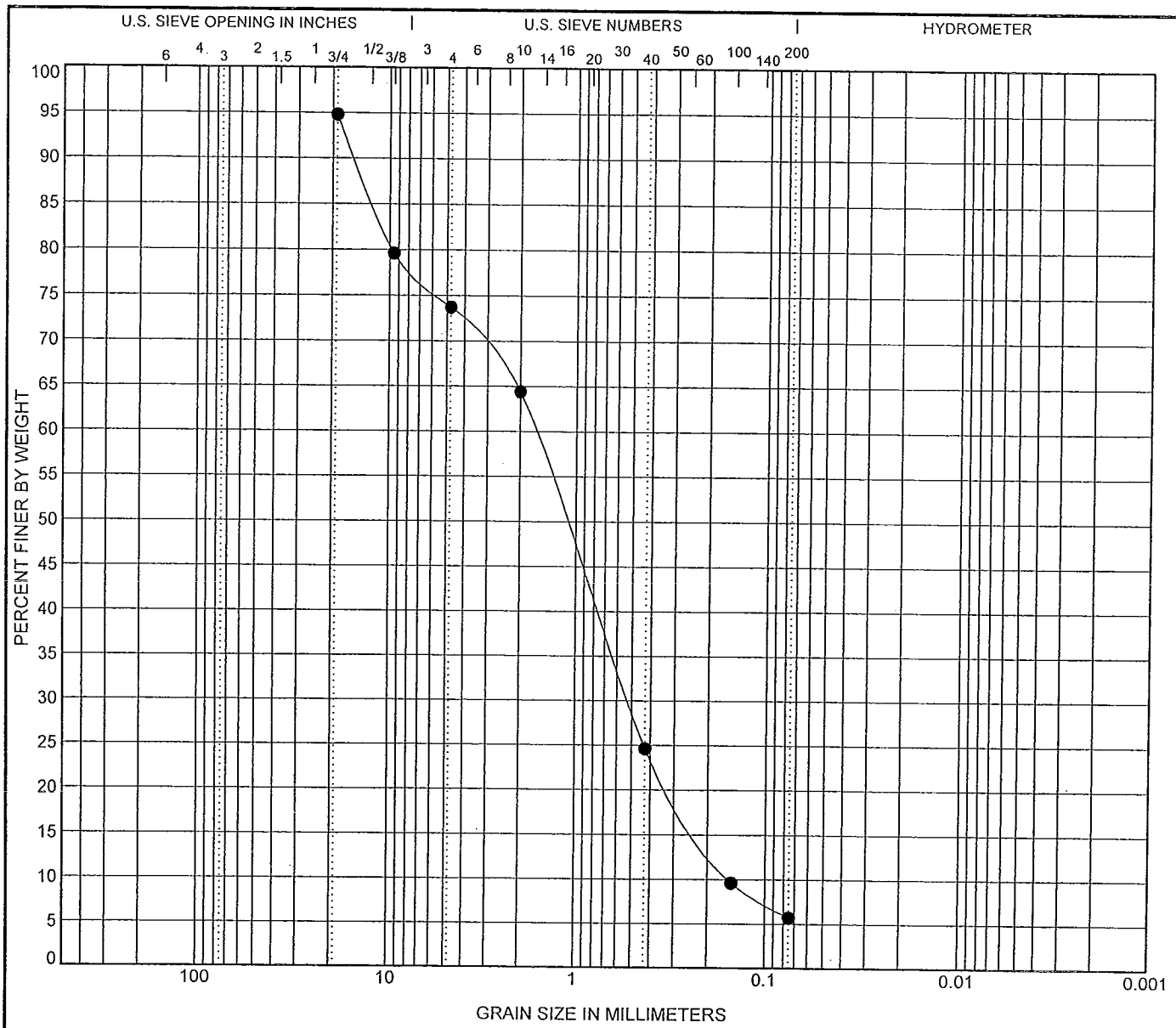
	Specimen Identification	Classification
●	Boring 5 at 35 feet	SAND WITH CLAY

GRAIN SIZE DISTRIBUTION TEST DATA

GRAIN_SIZE 04-012.3.GPJ VB_B.GDT 10/10/06

VAN BEVEREN & BUTELO, INC.

FIGURE A-6.12



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

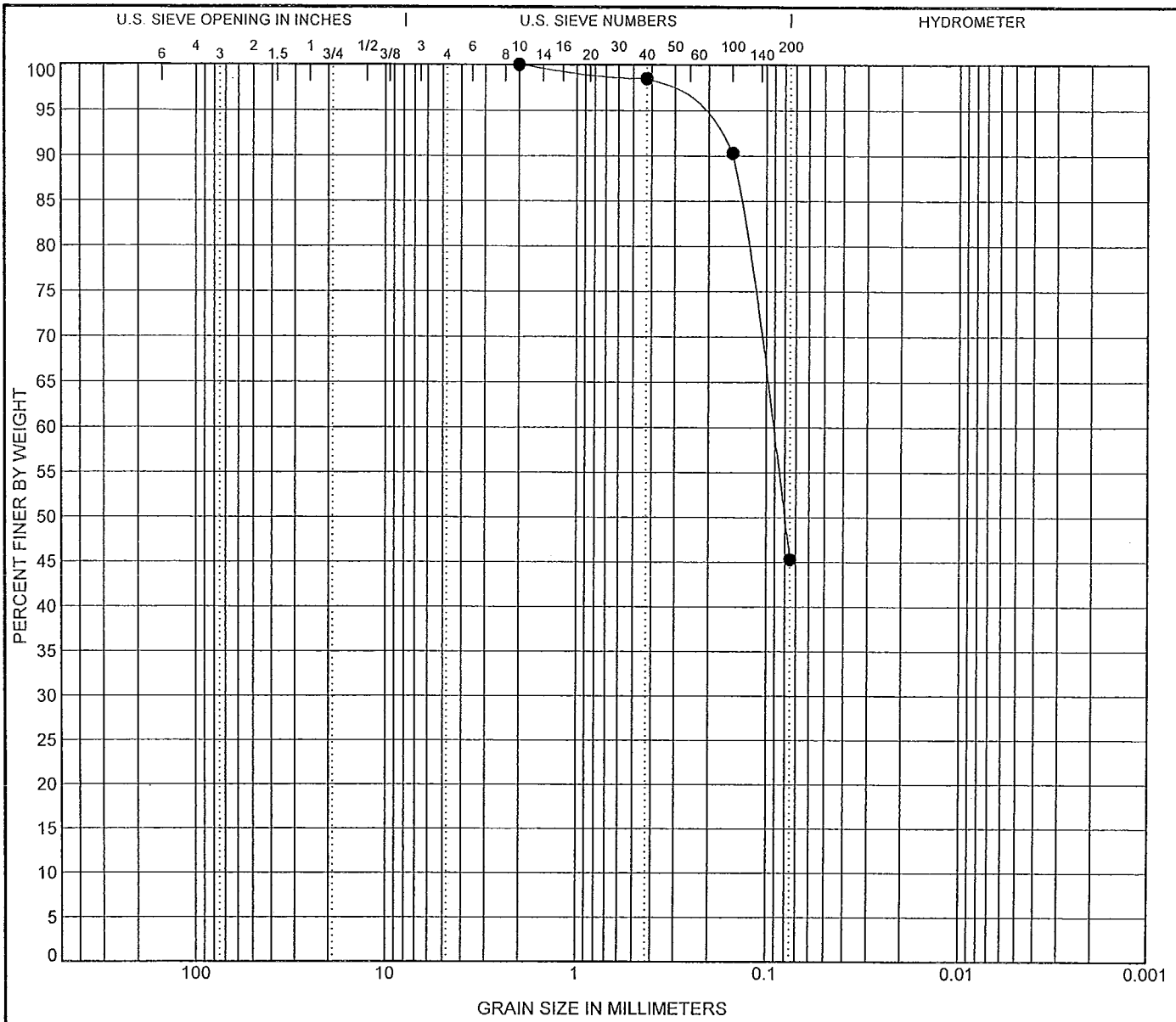
	Specimen Identification	Classification
●	**Boring 5 at 45 feet**	**SAND WITH GRAVEL**

GRAIN SIZE DISTRIBUTION TEST DATA

GRAIN_SIZE 04-012.3.GPJ VB_B.GDT 10/10/06

VAN BEVEREN & BUTELO, INC.

FIGURE A-6.13



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification
●	**Boring 5 at 74½ feet**	**SAND WITH SILT AND GRAVEL**

GRAIN SIZE DISTRIBUTION TEST DATA

VAN BEVEREN & BUTELO, INC.

FIGURE A-6.14

GRAIN_SIZE 04-012.3.GPJ VB_B.GDT 10/10/06

R - VALUE DATA SHEET

VB&B # 04-012.3

PROJECT NUMBER 33601 BORING NUMBER: B-1 @ 0'-4'

SAMPLE DESCRIPTION: Brown Sand

Item	SPECIMEN		
	a	b	c
Mold Number	7	8	9
Water added, grams	100	90	83
Initial Test Water, %	12.5	11.6	11.0
Compact Gage Pressure,psi	350	350	350
Exudation Pressure, psi	209	402	677
Height Sample, Inches	2.57	2.66	2.57
Gross Weight Mold, grams	3186	3227	3182
Tare Weight Mold, grams	2078	2116	2113
Sample Wet Weight, grams	1108	1111	1069
Expansion, Inches x 10exp-4	0	0	0
Stability 2,000 lbs (160psi)	17 / 33	13 / 28	11 / 24
Turns Displacement	4.68	4.63	4.58
R-Value Uncorrected	67	72	76
R-Value Corrected	68	75	77
Dry Density, pcf	113.2	113.4	113.6
DESIGN CALCULATION DATA			
Traffic Index Assumed:	4.0	4.0	4.0
G.E. by Stability	0.33	0.26	0.24
G. E. by Expansion	0.00	0.00	0.00

Equilibrium R-Value	72 by EXUDATION	Examined & Checked: 7 /17/ 06
REMARKS:	Gf = 1.25 0.0% Retained on the 3/4" Sieve. Partial Free Drainage.	REGISTERED PROFESSIONAL ENGINEER STEVEN R. MARVIN 30659 EXP. 3/31/08 STATE OF CALIFORNIA Steven R. Marvin, RCE 30659

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

LaBelle • Marvin

FIGURE A-7.1

R-VALUE GRAPHICAL PRESENTATION

PROJECT NO. 33601 P.N. 04-012.3

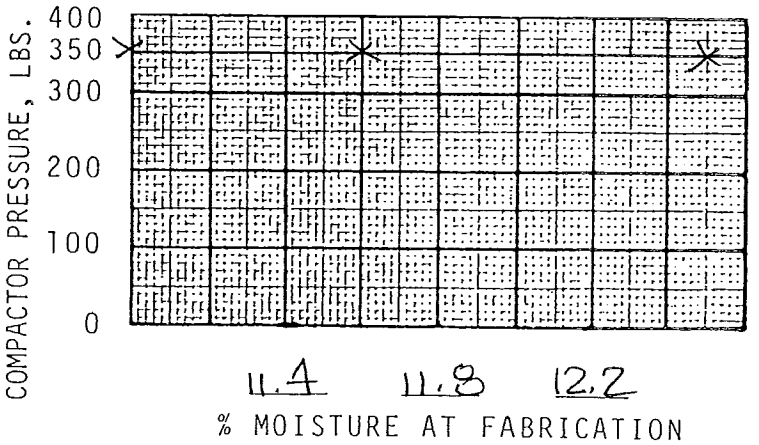
BORING NO. B-1 @ 0'-4'

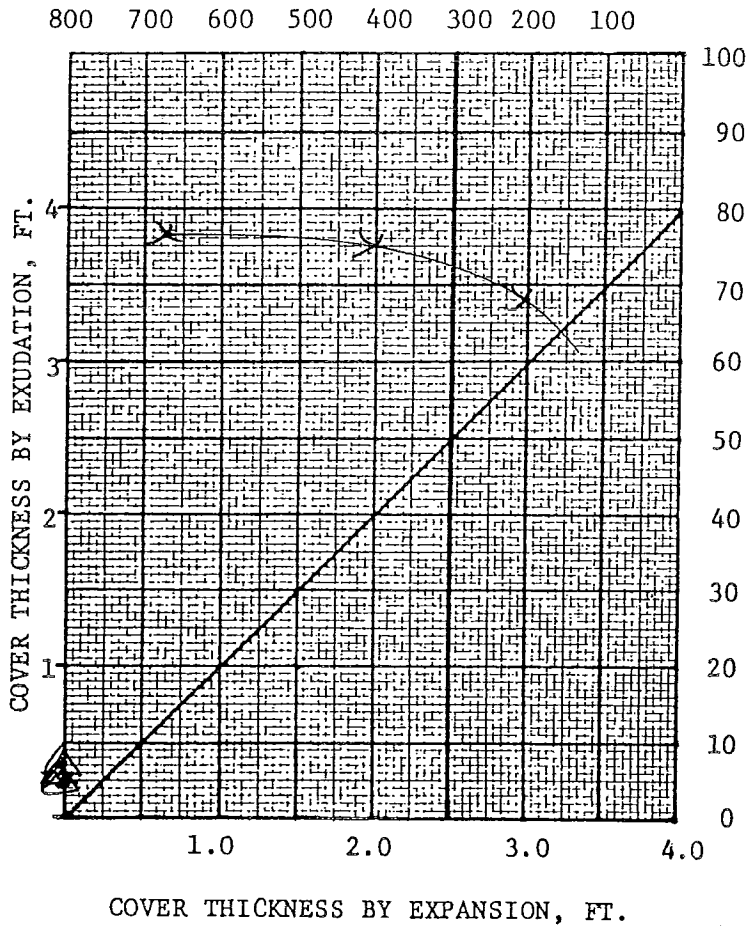
DATE 7-17-06

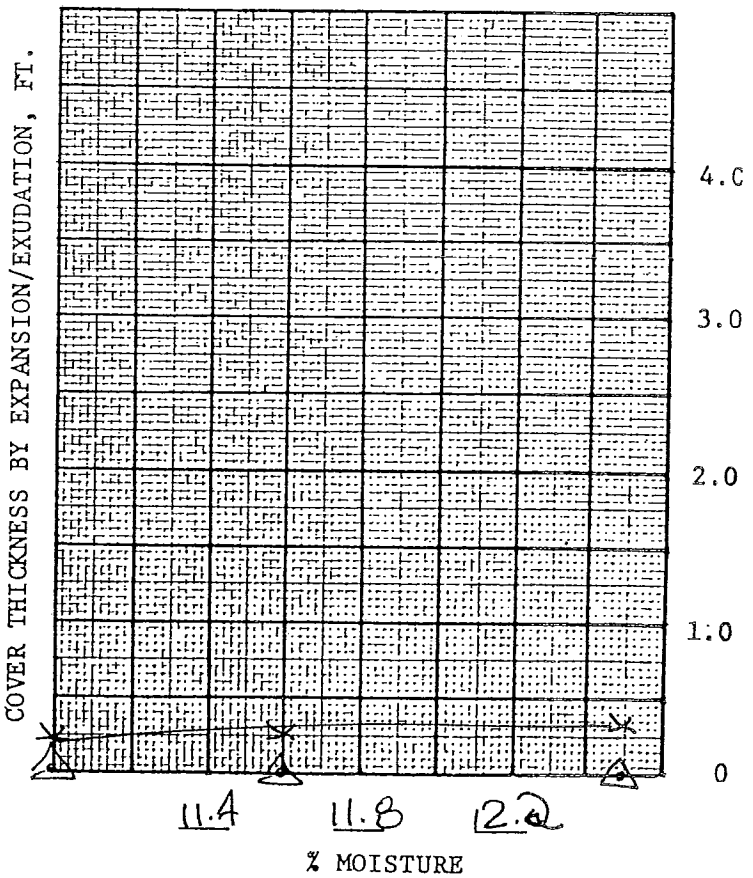
TRAFFIC INDEX Assume 4.0

R-VALUE BY EXUDATION 72

R-VALUE BY EXPANSION







R-VALUE vs. EXUD. PRES.

T by EXUDATION

EXUD. T vs. EXPAN. T

T by EXPANSION

REMARKS

GF=1.25

FIGURE A-7.2

LaBelle • Marvin
PROFESSIONAL PAVEMENT ENGINEERING

CONCECO/MATCOR ENGINEERING

August 28, 2006

Van Beveren & Butelo, Inc.
Attention: Tom Van Beveren
706 W. Broadway, Suite 201
Glendale, CA 91204

CME Job No.: 1S06260

Subject: Soil Chemistry Analysis for Van Beveren & Butelo, Inc. Job # 04-012.3 (Woodfin Suites)
3 Samples: B-1 @ 0-4', B-3 @ 15', B-5 @ 18'

Sample Number	As Rec'd Resistivity (ohm-cm)	[1]Minimum Resistivity (ohm-cm)	[2]pH	[3]Sulfate %	[3]Chloride %	(As Rec'd) Description
B-1	112,000	9,200	7.78	0.0024	0.0035	Medium brown, dry
B-3	1,160	1,000	7.55	0.0735	0.0060	Dark gray brown, moist
B-5	68	56	7.22	0.4110	1.1100	Medium gray/brown clay, very moist

NOTE: SAMPLES WERE ANALYZED IN ACCORDANCE WITH THE FOLLOWING METHODS.
1. MINIMUM RESISTIVITY DETERMINED BY SOIL BOX METHOD, (PER ASTM G-57)
2. PH MEASURED BY POTENTIOMETRIC METHOD USING STANDARD ELECTRODES. (PER CAL TRANS. #643)
3. CHLORIDE AND SULFATE WERE ANALYZED IN ACCORDANCE WITH EPA METHODS FOR CHEMICAL ANALYSIS FOR WATER AND WASTE, NO. 300 EPA-600/4-79-020. CONCENTRATION BY WEIGHT OF DRY SOIL.

CONCLUSIONS:

Material	Corrosion Class	Recommendation
Concrete	Negligible to severe for Sulfate exposure and negligible to severe for Chloride exposure, pH is neutral. (UBC Table 19-A-4)	-Type V Portland cement for concrete with a maximum water cement ratio of 0.45 and a minimum of 3 inches of cover over steel reinforcement. - It is suggested that a 6 mil polyethylene barrier be placed between concrete slabs and soil to reduce intrusion of moisture, sulfates and chlorides into the concrete slabs.
Steel Cast/Ductile Iron Mortar Coated Steel	Very Corrosive to Mildly Corrosive	- Install corrosion monitoring and cathodic protection for buried ferrous metal piping. - Provide electrical continuity along steel and ductile iron piping, to facilitate the installation of corrosion monitoring and cathodic protection, if required in the future. - Electrically isolate underground metal piping from above grade piping and other metallic structures. - Use separate ground rods for grounding interior piping.
Copper Piping	Corrosive Not tested for Ammonia NOTE: The soils were not tested for ammonium. Even trace amounts of ammonium can cause failure of copper piping.	- Overhead plumbing is the most effective method of corrosion control. - Copper pipes should not be installed in soils, which may contain ammonia without cathodic protection. - If Copper pipes are installed below ground, the soils should be tested for ammonia and Keldahl nitrogen. - Electrical isolation between hot and cold water lines and between buried copper and steel piping and structural steel should be maintained. - If ammonia is present, coat and cathodically protect any buried copper piping.

The test results and recommendations are based on the samples submitted, which may not be representative of overall site conditions. Additional sampling may be required to more fully characterize soil conditions.

Sincerely,

Kerri M. Howell

Kerri M. Howell, P.E. – President

CONCECO/MATCOR ENGINEERING, Inc. www.concecomatcor.com
200 Mason Circle, Suite A, Concord, CA 94520 USA 925•682•8780 or 2160 Winifred Street, Simi Valley, CA 93063 USA 805•527•3266

FIGURE A-8

APPENDIX B

PREVIOUS EXPLORATIONS

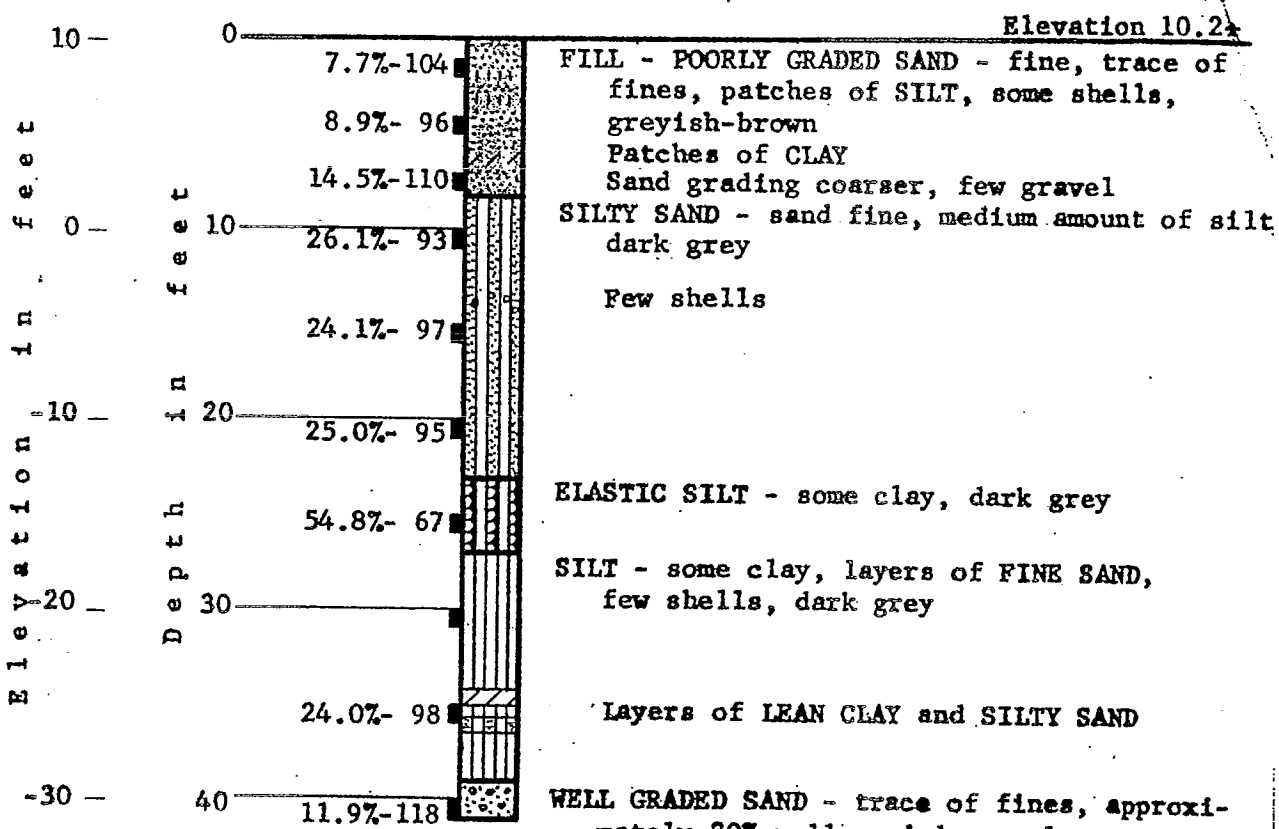
APPENDIX B
PREVIOUS EXPLORATIONS

LeRoy Crandall and Associates explored the site by drilling 17 borings to depths of 13 to 100 feet below the existing grade. In addition, Crandall installed 3 groundwater observation wells on the site. Bagahi Engineering explored the site by drilling 5 borings to depths of 60 to 100 feet and by performing 3 Cone Penetration Tests to depths of 60 to 68 feet.

The locations of these prior explorations are shown on Figure 1. Logs of the borings are attached. The elevation of the sand and gravel surface at each boring location is shown on Figure 1.

JOB 6543 DATE 1-11-62 BY M.T. fg

LOG OF BORING 1
6"-Diameter Rotary Wash Hole
Drilled January 4 and 5, 1962



NOTE: Groundwater level was at 6.8' at 8:30 on 1-6-62; drilling mud used to prevent caving.

KEY:

11.9%-118 — Indicates depth at which undisturbed sample obtained
— Dry density in pounds per cubic foot
— Field moisture content in percent of dry weight

Soils classified in accordance with the Unified Soil Classification System

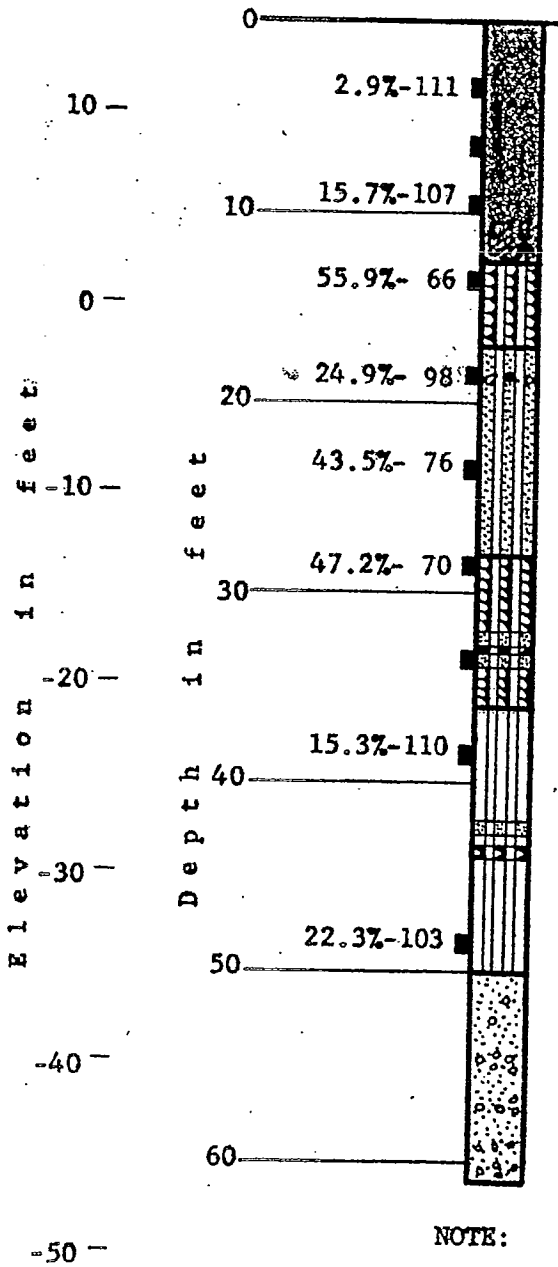
* Elevations refer to Los Angeles County datum.

LEROY CRANDALL & ASSOCIATES

PLATE A-1A

JOB 61543 DATE 1-4-62 BY MT

LOG OF BORING 2
6"-Diameter Rotary Wash Hole
Drilled January 4, 1962



Elevation 14.9

FILL - POORLY GRADED SAND - fine, trace of fines, layers of well graded sand, medium amount of shells, few small gravel, grey
More and larger gravel

Sand very fine, some fines
Pieces of concrete and oil paving, few gravel

ELASTIC SILT - some clay, lenses of organic matter, dark grey

SILTY SAND - sand very fine, medium amount of silt, few shells, dark grey
Patches of ELASTIC SILT

ELASTIC SILT - some clay, layers of SILTY SAND, dark grey

SILT - large amount of very fine sand, dark grey

Layers of SILTY SAND and ELASTIC SILT, brown
Small amount of fine sand, some clay

WELL GRADED SAND - clean, few well graded gravel, grey

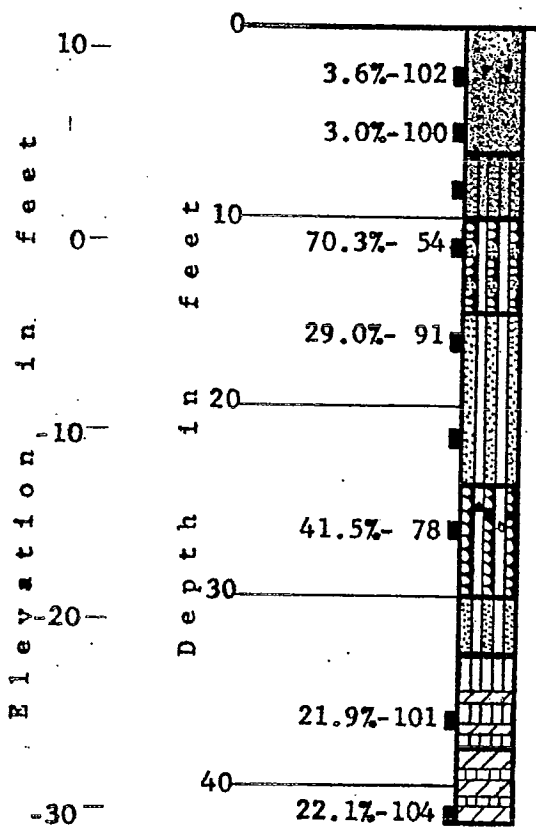
Approximately 15% gravel

NOTE: Groundwater level was at 11.0' at 8:30 on 1-6-62; drilling mud used to prevent caving.

LEROY CRANDALL & ASSOCIATES

JOB 61543 DATE 1-11-62 BY M.T. TB

LOG OF BORING 3
6"-Diameter Rotary Wash Hole
Drilled January 4, 1962



FILL - POORLY GRADED SAND - fine, trace of fines, streaks of SILT, few shells, mottled grey and brown

FILL - SILTY SAND - sand fine, small amount of silt, dark grey

ELASTIC SILT - some clay, lenses of SILTY SAND with large amount of shells, dark grey

SILTY SAND - sand very fine, medium amount of silt, dark grey

ELASTIC SILT - some clay, few shells, dark grey

SILTY SAND - sand very fine, large amount of silt, dark grey

SILT - medium amount of fine sand, layers of CLAY, dark grey

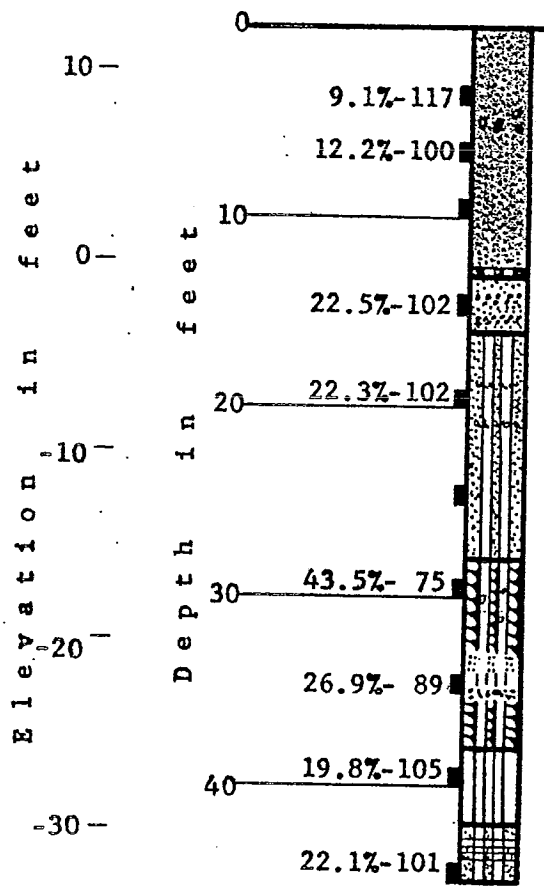
LEAN CLAY - with layers of SILT, dark brown

NOTE: Groundwater level was at 8.0' at 8:40 on 1-6-62; drilling mud used to prevent caving.

LEROY CRANDALL & ASSOCIATES

JOB 61543 DATE 1-11-62 BY M.T. fg

LOG OF BORING 4
6"-Diameter Rotary Wash Hole
Drilled January 5, 1962



Elevation 12.3

FILL - POORLY GRADED SAND - fine to medium, trace of fines, medium amount of shells, few gravel, grey

Layer of ELASTIC SILT

POORLY GRADED SAND - fine, some fines, lenses of shells, dark grey

SILTY SAND - sand fine, small amount of silt, dark grey

Layers containing large amount of shells

Medium amount of silt

ELASTIC SILT - some clay, few shells, dark grey

Lenses of ORGANIC MATTER and SILTY SAND

SILT - large amount very fine sand, dark grey

SILTY SAND - with layers of SILT and FINE SAND, dark grey

NOTE: Groundwater level was at 9.0' at 8:50 on 1-6-62; drilling mud used to prevent caving.

BORING 1

DATE DRILLED: March 6, 1968

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION 16.6*

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	SAMPLE		
		11.0	100	■	SP	FILL (HYDRAULIC) - SAND - fine, few sea shells, patches of Silt, grey
		8.3	103	■		
10		7.7	102	■		
	10	5.7	110	■		
		35.4	78	■		▼ WATER LEVEL (4:10 PM 3-6-68)
		38.3	76	■	MH	ELASTIC SILT - grey
0		73.8	55	■		
	20	23.4	99	■	SM	SILTY SAND - fine, few sea shells, grey
		31.0	93	■	SP	SAND - fine, grey
-10						
	30	26.8	97	■		
		24.9	98	■	SM	SILTY SAND - fine, grey
-20						
	40	11.0	126	■		
		13.0	126	■		
-30						
	50	14.2	118	■	SW	SAND - well graded, 20% to 30% gravel, grey
		7.2	131	■		
-40						
	60					

NOTE: Drilling mud used in drilling process. Mud removed to a depth of 20' after completion of drilling; water level measured at a depth of 11' ½ hour after mud removed.

* See Plate 1 for location and elevation of bench mark.

Soils classified in accordance with the Unified Soil Classification System.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

JOB A-6009-9 DATE 3-21-68 DR. JM O.E. 3' CHKD. SC

BORING 2

DATE DRILLED: March 6, 1968
EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION 12.5

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	SAMPLE		
10		8.7	102	■	SP	FILL (HYDRAULIC) - SAND - fine, few sea shells, patches of Silt, grey
		7.4	98	■		
		11.5	94	■		
		19.3	96	■		▼ WATER LEVEL (4:05 PM 3-6-68)
	10	19.3	85	■		
0		25.5	92	■		Large amount of sea shells 6"-diameter piece of concrete
	20	23.6	99	■	SM	SILTY SAND - fine, large amount of sea shells, grey
-10		25.4	99	■	SP	SAND - fine, few sea shells, grey
	30	40.5	80	■	CL	SILTY CLAY - grey
-20		20.8	108	■	SM	SILTY SAND - fine, grey
	40	13.3	121	■		Few gravel
-30		15.9	114	■	SW	SAND - well graded, 20% to 30% gravel, grey
	50	9.2	122	■		

NOTE: Drilling mud used in drilling process. Mud removed to a depth of 20' after completion of drilling; water level measured at a depth of 8' 3 hours after mud removed.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

BORING 3

DATE DRILLED: March 6, 1968
EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION 11.6

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	SAMPLE		
10		40.5	77	■	SP	FILL (HYDRAULIC) - SAND - fine, few sea shells, patches of Silt, grey
		11.1	94	■		
		16.1	103	■		▼ WATER LEVEL (4:00 PM 3-6-68)
		20.7	104	■		
	10				MH	ELASTIC SILT - grey
0		25.1	101	■	SM	SILTY SAND - fine, grey
		22.2	99	■	SP	SAND - fine, few sea shells, grey
		25.7	97	■		
	20					
-10		23.9	100	■		
					CL	SILTY CLAY - grey
		43.7	92	■		
	30					
-20		28.2	95	■	SM	SILTY SAND - fine, grey
		16.4	118	■	ML	SANDY SILT - grey
	40					
-30		7.7	123	■	SW	SAND - well graded, 20% to 30% gravel, grey
		7.9	130	■		
	50					

NOTE: Drilling mud used in drilling process. Mud removed to a depth of 15' after completion of drilling; water level measured at a depth of 7' 5½ hours after mud removed.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

JOB A-6007-9 DATE 2/-68 DR JN O.E. CHKD. CC

BORING 4

DATE DRILLED: March 5, 1968

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION 14.6

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	SAMPLE		
		9.0	104		SP	FILL (HYDRAULIC) - SAND - fine, 10% to 20% sea shells, patches of Silt, grey
10		19.9	91			Few sea shells
		11.0	98			
		20.4	96			▼ WATER LEVEL (3:55 PM 3-6-68)
	10	22.3	90			
					SM	SILTY SAND - fine, about 10% sea shells, grey
0		26.1	95			
		26.7	95			
	20	29.2	95			
					MH	ELASTIC SILT - grey
-10		36.3	88		SM	SILTY SAND - fine, few sea shells, grey
	30	52.0	69		CL	SILTY CLAY - grey
-20		50.6	70			
	40	20.2	107		ML	SANDY SILT - grey
-30		16.7	116			Layer of SILTY SAND
	50	9.3	131		SW	SAND - well graded, 20% to 30% gravel, grey
-40		14.6	120			Two cobbles
	60					

NOTE: Drilling mud used in drilling process. Mud removed to a depth of 30' after completion of drilling; water level measured at a depth of 9½' 24 hours after mud removed.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

PLATE A-4

JOB 71-60049 DATE 5-21-68 DR JM O.E. CHKD.

BORING 5

DATE DRILLED: March 5, 1968

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION 15.0

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	SAMPLE		
		11.0	99	■	SP	FILL (HYDRAULIC) - SAND - fine, few sea shells, grey
10		8.5	101	■		
		15.4	99	■		
	10	19.6	102	■		WATER LEVEL (3:50 PM 3-6-68) Patches of Silt
		30.8	92	■		
0		62.4	61	■	MH	ELASTIC SILT - grey
		23.3	105	■	SM	SILTY SAND - fine, layers of sea shells, grey
	20					
-10		30.4	90	■		
		28.1	94	■		
	30				ML	SANDY SILT - few sea shells, grey
-20		30.8	90	■		
		26.3	97	■	SP	SAND - fine, grey
	40					
-30		20.2	105	■	ML	SANDY SILT - grey
		22.7	105	■	SM	SILTY SAND - fine, grey
	50					
-40		11.4	128	■	SW	SAND - well graded, 20% to 30% gravel, grey
						No gravel
		15.1	116	■		Layer of SILTY SAND
	60					

NOTE: Drilling mud used in drilling process. Mud removed to a depth of 25' after completion of drilling; water level measured at a depth of 10' 26 hours after mud removed.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

BORING 6

DATE DRILLED: March 5, 1968
EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION 12.9

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	SAMPLE		
		10.1	111		SP	FILL (HYDRAULIC) - SAND - fine, few sea shells, grey
10		12.0	92			
		3.0	102			
		4.8	105			▼ WATER LEVEL (3:45 PM 3-6-68)
	10	25.0	101			
		69.3	59		ML	ELASTIC SILT - grey
0		39.2	78		SM	SILTY SAND - fine, few sea shells, grey
	20	30.0	94			
-10		31.3	89			
	30	46.5	74		CL	SILTY CLAY - grey
-20		34.0	87			
	40	19.9	109			
-30		10.1	127		SW	SAND - well graded, 20% to 25% gravel, grey
	50	18.5	110			
-40						
	60					

NOTE: Drilling mud used in drilling process. Mud removed to a depth of 20' after completion of drilling; water level measured at a depth of 8½' 30 hours after mud removed.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

JOB A-60049 DATE 3-21-68 DR JM O.E. CHKD.

BORING 1

DATE DRILLED: June 27, 1973

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION 11.2**

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOWS*	SAMPLE	
10					SP	HYDRAULIC FILL - SAND - fine, light brown
		8.4	89	16		Few gravel
	5					
5		23.0	92	8		WATER LEVEL (6-27-73)
	10	47.3	73	1	SM	SILTY SAND - fine, traces of organic matter, grey
0		27.1	98	6		
	15	26.2	94	11	SP	SAND - fine, grey
-5				9		Large amount of sea shells
	20	24.8	99	25		

(CONTINUED ON FOLLOWING PLATE)

9 — Depth at which Standard Penetration test performed

Number of blows required to drive sampler 12". Driving weight = 140 lbs.; Stroke = 30".

* Number of blows required to drive LC&A sampler 12". Driving weight = 300 lbs.; Stroke = 2½'.

** See Plate 1 for location and elevation of benchmark.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

JOB H-1034-B DATE 1-6-73 DR. O.E. CHKD.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

JOB A1634-B DATE 1-6-73 DR. O.E. CHKD. mu

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

BORING I (CONTINUED)

DATE DRILLED: June 27, 1973

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOWS	SAMPLE		
-10							
-15	25	22.7	104	33	■		
				20	[ ]		
						ML	CLAYEY SILT - few shells, dark grey
-20	30	60.9	62	2	■		
-25	35	48.3	72	6	■		
				26	[ ]		
						ML	SANDY SILT - brownish-grey
-30	40	14.5	120	9	■		
						SM	SILTY SAND - fine, light brown
						SW	SAND - well graded, large amount of gravel and cobbles, light brown
-35	45	14.7	121	26	■		
				30	[ ]		
	50	10.1	120	50	■		

(CONTINUED ON FOLLOWING PLATE)

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

BORING I (CONTINUED)
DATE DRILLED: June 27, 1973
EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu.ft.)	BLOWS	SAMPLE	
-40						
-45	55	9.3	129	34	SP	SAND - fine, grey and brown
-50	60	18.9	108	28 / 38		
-55	65	25.7	99	32		
-60	70	24.2	100	35	SM	SILTY SAND - fine, grey
-65	75	29.9	91	29		
-70	80	33.7	87	51		
	85	32.0	91	21		

NOTE: Drilling mud used in drilling process. Mud removed to a depth of 20' at completion of drilling. Water level measured at a depth of 7.4' 12 hours after removing mud.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

JOB A-11034 B DATE 7-6-73 DR. O.E. CHKD.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

BORING 2

DATE DRILLED: June 26 & 27, 1973

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION 11.3

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOWS	SAMPLE		
10		7.7	96	10		SP	HYDRAULIC FILL - SAND - fine, patches of Clay and Silt, grey
	5	4.3	115	10			
5		18.5	101	8			Few gravel WATER LEVEL (6-27-73)
	10	30.6	92	0		SM	SILTY SAND - fine, grey Large amount of sea shells
0							
	15	23.5	101	14			
-5		28.9	93	6			
	20	26.6	99	20		SP	SAND - fine, grey

(CONTINUED ON FOLLOWING PLATE)

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

JOB A 10348 DATE 1-6-73 DR. O.E. CHKD.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

JOB A110-A-B DATE 1-6-73 DR. O.E. CHKD.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

BORING 2 (CONTINUED)

DATE DRILLED: June 26 & 27, 1973

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu.ft.)	BLOWS	SAMPLE		
-10							Odorous
	25	18.9	108	17	■		
-15						ML	CLAYEY SILT - some Sand, grey
	30	28.8	95	2	■		
-20							
	35	22.6	105	5	■		
-25							Greyish-brown
							Few gravel
	40	16.5	114	10	■		
-30							
	45	9.9	134	37	■	SW	SAND - well graded, large amount of gravel and cobbles, light brown
-35							
	50						

(CONTINUED ON FOLLOWING PLATE)

LOG OF BORING

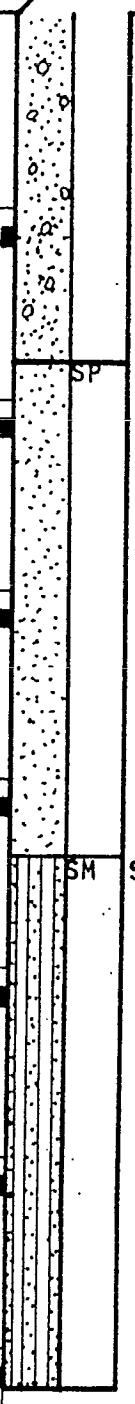
LEROY CRANDALL AND ASSOCIATES

BORING 2 (CONTINUED)

DATE DRILLED: June 26 & 27, 1973

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOWS	SAMPLE
-40					
-45	55	14.8	116	26	
-50	60	19.2	108	30	
-55	65	23.4	103	50	
-60	70	25.4	98	72	
-65	75	27.1	97	24	
-70	80	32.7	90	24	
-75	85	33.9	88	24	
	90				



SP SAND - fine, grey

Brownish-grey

SM SILTY SAND - fine, grey and brown

Lenses of Silt

NOTE: Drilling mud used in drilling process. Mud removed to a depth of 16' at completion of drilling. Water level measured at a depth of 7.3' 22 hours after removing mud.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

JOB DATE DR. O.E. CHKD.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

BORING 3

DATE DRILLED: June 26, 1973

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION 11.4

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu.ft.)	BLOWS	SAMPLE	
10						SP HYDRAULIC FILL - SAND and SILTY SAND - fine, light brown
		5.8	102	6		
	5					
5		14.2	94	11		
						WATER LEVEL (6-28-73)
		21.8	104	7		
	10					
0						MH ELASTIC SILT - some organic matter, grey
		68.7	58	1		
				6		
	15	28.8	97	4		SM SILTY SAND - fine, grey
-5						Large amount of sea shells
	20					

(CONTINUED ON FOLLOWING PLATE)

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

JOB DATE DR. O.E. CHKD.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

BORING 3 (CONTINUED)

DATE DRILLED: June 26, 1973

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu.ft.)	BLOWS	SAMPLE	
-10				15	SP	SAND - fine, grey
	25					
-15		29.2	94	21		
	30				ML	CLAYEY SILT - some organic matter, grey
-20		72.6	58	6		
				3		
	35					
-25						
		23.9	104	5		
	40					
-30					CL	SILTY CLAY - grey
		23.4	103	5		
	45			9		
-35					SW	SAND - well graded, large amount of gravel and cobbles, light brown
		17.6	112	29		
	50					

(CONTINUED ON FOLLOWING PLATE)

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

JOB A71034B DATE 7-6-73 DR. O.E. CHKD.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

BORING 3 (CONTINUED)
DATE DRILLED: June 26, 1973
EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	BLOWS	SAMPLE	
-40						
	55			24		
-45					SP	SAND - fine, brown and grey
		26.4	95	15		
	60					
-50						
		28.3	94	28		
	65			41		
-55						
		19.2	110	50		
	70					
-60						
		21.3	108	31		
	75			53		
-65						
		27.9	94	24	SM	SILTY SAND - fine, grey
	80					
-70					SP	SAND - fine, grey
		32.3	103	24	ML	SANDY SILT - grey
	85					

NOTE: Drilling mud used in drilling process. Mud removed to a depth of 20' at completion of drilling. Water level measured at a depth of 7.5' two days after removing mud.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

JOB A10348 DATE 6-73 DR. O.E. CHKD.

LOG OF BORING

LEROY CRANDALL AND ASSOCIATES

BORING I

DATE DRILLED: April 22, 1982

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION 12*

ELEVATION (ft.)	DEPTH (ft.)	"N" VALUE STD. PEN. TEST	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	DRIVE ENERGY (ft.-kips/ft.)	SAMPLE LOC		
10			6.8	103	12		SP	HYDRAULIC FILL - SAND - fine, some seashells, few pieces of concrete, light brown
	5		6.0	105	10			
5			6.7	98	7			Small pieces of wood
	10	13					SM	HYDRAULIC FILL - SILTY SAND - fine, grey
0								Large amount of debris, (including wood and rubber), oil saturated
			29.3	87	2		MH	ELASTIC SILT - some seashells, dark grey
	15						SM	SILTY SAND - fine, large amount of seashells, grey
-5								Less seashells
		13						
	20							
-10								
			32.1	87	12			
	25							
-15								
		<1					MH	ELASTIC SILT - some seashells, bluish-grey
	30							
-20							SM	SILTY SAND - fine, large amount of seashells, grey Layers of Elastic Silt
	35		47.7	73	4			

(CONTINUED ON FOLLOWING PLATE)

* Elevations refer to datum of reference survey.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

JO 1E- 38 TE 2/8 DR TN W.P.

LOG OF BORING

LeROY CRANDALL AND ASSOCIATES

BORING I (CONTINUED)

DATE DRILLED: April 22, 1982

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION (ft.)	DEPTH (ft.)	"N" VALUE STD. PEN. TEST	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	DRIVE ENERGY (ft.-kips/ft.)	SAMPLE LOC.		
-25							ML	SANDY SILT - grey
		1						Patches of Elastic Silt
	40							
-30								
			20.9	104	4	■		
	45							
-35							CL	SILTY CLAY - slightly Sandy, grey and brown
							SW	SAND - well graded, some Silt, gravel, light brown
	50	>100						
-40								
	55		12.0	124	42	■		Light grey
-45								
	60		19.4	109	19	■		
-50								
								Layers of Sandy Silt, grey
	65		21.5	105	32	■		
								Lenses of fine Sand
-55								
	70		22.0	105	39	■		

(CONTINUED ON FOLLOWING PLATE)

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

LOG OF BORING

LeROY CRANDALL AND ASSOCIATES

JO 124 IE- 38 TE 78 DR IN W.P.

BORING I (CONTINUED)

DATE DRILLED. April 22, 1982

EQUIPMENT USED. 5"-Diameter Rotary Wash

ELEVATION (ft.)	DEPTH (ft.)	"N" VALUE STD. PEN. TEST	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	DRIVE ENERGY (ft.-kips/ft.)	SAMPLE LOC.	
-60							
	75						
-65			25.6	100	22		
	80						
-70							
	85		23.8	102	25		Layers of Sandy Silt
-75							
	90					SP	SAND - fine, some fines, traces of organic matter, grey
-80			28.0	94	28		
	95						
-85						SM	SILTY SAND - very fine to fine, grey
	100		29.9	93	18		

NOTE: Drilling mud used in drilling process. Water level not established. Installed 2"-Diameter PVC pipe to depth of 100' for downhole seismic survey. Annular space around outside of pipe backfilled with pea gravel.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

LOG OF BORING

LeROY CRANDALL AND ASSOCIATES

BORING 2

DATE DRILLED: April 23, 1982

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION 7

ELEVATION (ft.)	DEPTH (ft.)	"N" VALUE STD. PEN. TEST	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	DRIVE ENERGY (ft.-kips/ft.)	SAMPLE LOC.		
5			20.3	97	4		SP	HYDRAULIC FILL - SAND - fine, some Silt, seashells, light brown
	5		17.0	98	2			
0								Grey
			26.7	94	1			
	10							
-5			21.5	104	8		SP	SAND - fine, some seashells, grey
								Layers of Elastic Silt
	15		31.9	92	2			
-10			31.0	90	8			
	20		27.5	98	10			
-15							MH	ELASTIC SILT - some seashells, grey
	25		31.7	84	<1			
-20							SM	SILTY SAND - fine to very fine, grey
	30		22.6	104	6			
								Layers of Silt
-25								
							ML	SANDY SILT - slightly Clayey, grey
	35		19.8	111	1			
-30								
							SP	SAND - predominantly fine, about 20% gravel, some cobbles, grey
	40		15.3	122	21			

(CONTINUED ON FOLLOWING PLATE)

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

LOG OF BORING

LeROY CRANDALL AND ASSOCIATES

BORING 2 (CONTINUED)

DATE DRILLED: April 23, 1982

EQUIPMENT USED: 5"-Diameter Rotary Wash

ELEVATION (ft.)	DEPTH (ft.)	"N" VALUE STD. PEN. TEST	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	DRIVE ENERGY (ft.-kips/ft.)	SAMPLE LOC.	
-35	45						Large cobbles (difficult drilling from 44' to 59')
-40							
	50		12.4	124	35		About 20% gravel, some cobbles Lenses of Silty Sand
-45							About 10% gravel, few cobbles
	55		28.7	98	25		
-50							
	60		24.3	103	22		Lenses of Silty Sand Some fines
-55							
	65		26.3	99	35		
-60							
	70		29.8	95	20	SM	SILTY SAND - fine, bluish-grey
-65							
	75		31.8	91	20		
-70							
	80						

NOTE: Drilling mud used in drilling process. Mud removed to 25' at completion of drilling. Water level measured at 11½' two hours after removing mud.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

LOG OF BORING

LeROY CRANDALL AND ASSOCIATES

BORING 3

DATE DRILLED: April 27 & 28, 1982

EQUIPMENT USED: 20"-Diameter Bucket 0' to 12'
5"-Diameter Rotary Wash below 12'

ELEVATION 9

ELEVATION (ft.)	DEPTH (ft.)	"N" VALUE STD. PEN. TEST	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	DRIVE ENERGY (ft.-kips/ft.)	SAMPLE LOC.		
			7.7	103	3		SP	HYDRAULIC FILL - SAND - fine, some Silty Sand, few gravel, light brown
5								
	5		3.7	113	3			Grey
			6.9	93	2			Oil saturated, petroleum odor, pieces of asphalt
0								
	10						SM	SILTY SAND - fine, bluish-grey
-5			24.3	101	4			Dark grey Lenses of Sandy Silt
	15							
			27.7	97	5			
-10							SP	SAND - very fine to fine, some Silt, seashells, grey
	20		24.4	102	10			

NOTE: BUCKET BORING: Water seepage encountered at a depth of 10'. Heavy sloughing and caving below 10'. Boring caved back from 12' to 10½'.

ROTARY WASH BORING: Drilling mud used in drilling process. Installed 2"-Diameter PVC pipe to depth of 20' as observation well. Annular space around outside of pipe backfilled with pea gravel. Water level measured at 8½' two days after completion of drilling.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

LOG OF BORING

LeROY CRANDALL AND ASSOCIATES

BORING 4

DATE DRILLED: April 27, 1982

EQUIPMENT USED: 20"-Diameter Bucket

ELEVATION 10

ELEVATION (ft.)	DEPTH (ft.)	"N" VALUE STD. PEN. TEST	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	DRIVE ENERGY (ft.-kips/ft.)	SAMPLE LOC.		
			9.8	107	5		SP	HYDRAULIC FILL - SAND - fine, some Silty Sand, few gravel, some seashells, light brown
5	5		5.7	105	6			Grey
			9.7	100	8			
0	10						SP	SAND - fine, some fines, bluish-grey
							MH	ELASTIC SILT - some Clay, dark bluish-grey
-5	15							(BORING TERMINATED AT 13' DUE TO HEAVY SLOUGHING, CAVING AND DIFFICULT DRILLING)

NOTE: Water seepage encountered at a depth of 10'. Water level measured at 11' in observation well located 10' to south 3 days after completion of drilling. Heavy sloughing and caving below 11'.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

JOB E-L 38 DATE 5/8 DR. IN W.P.

LOG OF BORING

LeROY CRANDALL AND ASSOCIATES

DATE OBSERVED: 2/1/2000 **LOG OF BORING NO. B-1** LOCATION: See Plot Plan

LOGGED BY: SG METHOD OF DRILLING: 5" Rotary Wash Auger GROUND EL.: 12.5'±

DRILLING CONTRACTOR: A & W HAMMER: 140 lb. SPT FALLING: 30 inches
400 lb sampler RING 18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
2-						
4-						Light brown fine to medium SAND, medium dense, shell fragments, moist
6-		S	14	20.4		
8-						
10-		R	17	24.0		
12-						@10' Asphalt Concrete, 5"± thick
14-						
16-		S	4	39.5		@15' Dark gray silty fine SAND, trace gravel and shell fragments, loose to medium dense, wet
18-						
20-		R	3	35.0	86.5	
22-						
24-						
26-		S	31	26.0		@25' becoming medium dense to dense
28-						
30-		R	2	44.0	77.1	@30' Dark gray sandy SILT, soft, wet
32-						
34-						
36-		S	2	48.6		
38-						
40-		R	3	21.6	107.3	
42-						
44-						

JOB NO.: 103n-200-00 FIGURE: B-3

BAGAHI ENGINEERING

DATE OBSERVED: 2/1/2000 **LOG OF BORING NO. B-1** LOCATION: See Plot Plan

LOGGED BY: SG METHOD OF DRILLING: 5" Rotary Wash Auger GROUND EL.: 12.5'±

DRILLING CONTRACTOR: A & W HAMMER: 140 lb SPT FALLING: 30 inches
400 lb RING 18 inches

Depth (ft.)	Soil Type	Sample Type		Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-							
			S	11			@45' Dark gray sandy SILT, silty SAND with black organics , loose, moist
46-							
48-							@48' Light brown medium to coarse gravelly SAND, medium dense, wet
50-			R	30	11.0	125.8	
52-							
54-							
			S	60			@55' Light Greenish gray medium SAND, very dense, wet
56-							
58-							
60-			R	25	15.1	113.0	@60' Light greenish gray coarse SAND, dense, wet
62-							
64-							
66-							End of boring @60'
							Ground water @10' after drilling
68-							Cave in @23'
70-							Installed 20' of 2" PVC monitoring well, 10' slotted and 10' solid pipe
72-							
74-							
76-							
78-							
80-							
82-							
84-							
86-							
88-							

JOB NO.: 103n-200-00 FIGURE: B-4

BAGAHI ENGINEERING

DATE OBSERVED: 2/1/2000 **LOG OF BORING NO. B-2** LOCATION: See Plot Plan

LOGGED BY: SG METHOD OF DRILLING: 5" Rotary Wash Auger GROUND EL.: 11'±

DRILLING CONTRACTOR: A & W HAMMER: 140 lb. SPT FALLING: 30 inches
400 lb sampler RING 18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
2-						
4-						Light brown gravelly fine SAND, medium dense, moist
6-		S	16			@5' Light brown fine SAND, loose to medium dense, shell fragments, moist
8-						
10-		R	9	34.8	83.4	@10' Dark gray sandy SILT, soft, shell fragments, very moist to moist
12-						
14-		S	7	30.5		@15' Changing to more fine SAND, less silt
16-						
18-						
20-		R	12	30.6	91.6	@20' Dark gray fine silty SAND, medium dense, wet
22-						
24-		S	2	51.7		@25' Greenish gray sandy SILT, soft , wet
26-						
28-						
30-		R	1	45.0	75.2	
32-						
34-		S	21	29.1		@35' Changing to fine SAND, medium dense, wet
36-						
38-						
40-		R	3	24.1	108.2	
42-						
44-						

JOB NO.: 103n-200-00 FIGURE: B-5

BAGAHI ENGINEERING

DATE OBSERVED: 2/1/2000 **LOG OF BORING NO. B-2** LOCATION: See Plot Plan

LOGGED BY: SG METHOD OF DRILLING: 5" Rotary Wash Auger GROUND EL.: 11'±

DRILLING CONTRACTOR: A & W HAMMER: 140 lb SPT FALLING: 30 inches
400 lb RING 18 inches

Depth (ft.)	Soil Type	Sample Type		Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-			S	20	28.5		Greenish gray fine SAND, medium dense, wet
46-							
48-							
50-			R	14	26.8	102.4	@50' Dark gray silty SAND with trace of clay, medium dense, wet
52-							@52' Dark gray medium SAND with fine gravel, loose, wet
54-			S	33			
56-							
58-							
60-			R	6	19.8	110.0	@60' Dark gray fine silty SAND, loose, wet
62-							
64-							
66-							End of boring @60'
68-							Ground water @12' Cave in @12'
70-							Installed 18' of 2" PVC monitoring well, 10' solid and 8' perforated.
72-							
74-							
76-							
78-							
80-							
82-							
84-							
86-							
88-							

JOB NO.: 103n-200-00 FIGURE: B-6

BAGAHI ENGINEERING

DATE OBSERVED: 2/1/2000

LOG OF BORING NO. B-3

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: 1.2'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb. SPT
400 lb sampler RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type	Blow s/Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
2-						
4-						
		S	10	36.2		Dark gray silty fine SAND, medium dense, moist
6-						
8-						
10-		R	6	29.1	94.4	
12-						
14-						
		S	9	36.9		@15' Greenish gray silty SAND, medium dense, wet
16-						
18-						
20-		R	2	56.5	68.2	@20' Dark gray clayey SILT, soft, wet
22-						
24-						@25' Becoming more sandy, loose, trace of shell fragments
		S	3	42.4		
26-						
28-						
30-		R	3	21.6	106.1	
32-						
34-						
		S	24	27.9		
36-						
38-						
40-		R	17	21.0	120.0	@40' Dark gray silty fine SAND, medium dense, wet
42-						
44-						

JOB NO.: 103n-200-00

FIGURE: B-7

BAGAHI ENGINEERING

DATE OBSERVED: 2/1/2000 **LOG OF BORING NO. B-3** LOCATION: See Plot Plan

LOGGED BY: SG METHOD OF DRILLING: 5" Rotary Wash Auger GROUND EL.: 1.2'±

DRILLING CONTRACTOR: A & W HAMMER: 140 lb SPT FALLING: 30 inches
400 lb RING 18 inches

Depth (ft.)	Soil Type	Sample Type		Blow s/Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-							
			S	36	13.4		
46-							@45' Greenish gray gravelly medium to coarse SAND, medium dense, wet
48-							
50-			R	17	33.9	91.3	
52-							@51' Dark gray silty fine SAND, medium dense, wet
54-							
			S	38	25.5		
56-							@55' Greenish gray medium to coarse SAND, medium dense, wet
58-							
60-			R	30	19.8	106.5	
62-							
64-							
s66-							End of boring @60' Ground water @5' Cave in @10'
68-							
70-							
72-							
74-							
76-							
78-							
80-							
82-							
84-							
86-							
88-							

JOB NO.: 103n-200-00 FIGURE: B-8

BAGAHI ENGINEERING

DATE OBSERVED: 2/2/2000 **LOG OF BORING NO. B-4** LOCATION: See Plot Plan

LOGGED BY: SG METHOD OF DRILLING: 5" Rotary Wash Auger GROUND EL.: 2.6'±

DRILLING CONTRACTOR: A & W HAMMER: 140 lb. SPT FALLING: 30 inches
400 lb sampler RING 18 inches

Depth (ft.)	Soil Type	Sample Type		Blow s/Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
		B					
2-							Light brown fine SAND, medium dense, moist
4-							
			S	2	33.2		@5' Dark gray fine silty SAND, loose, shell fragments, moist
6-							
8-							@7' Dark gray fine silty SAND, loose to medium dense, very moist
10-			R	4	28.9	92.6	
12-							
14-							
			S	20	30.7		
16-							
18-							@18' Dark gray clayey SILT, soft, wet
20-			R	2	59.2	84.9	
22-							
24-							
			SS	2	65.7		
26-							
28-							
30-			R	4	21.3	107.0	@30' Changing to silty fine SAND, loose, wet
32-							
34-							
			S	13	25.3		@35' Greenish gray silty SAND with black organic matter, medium dense, wet
36-							
38-							@38' Light greenish gray gravelly medium to coarse SAND, dense, wet
40-			R	35	20.2	110.8	
42-							
44-							

JOB NO.: 103n-200-00 FIGURE: B-9

 BAGAHI ENGINEERING

DATE OBSERVED: 2/2/2000 **LOG OF BORING NO. B-4** LOCATION: See Plot Plan

LOGGED BY: SG METHOD OF DRILLING: 5" Rotary Wash Auger GROUND EL.: 2.6'±

DRILLING CONTRACTOR: A & W HAMMER: 140 lb SPT FALLING: 30 inches
400 lb RING 18 inches

Depth (ft.)	Soil Type	Sample Type		Blow s/Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-							
			S	72	11.0		Light greenish gray gravelly medium to coarse SAND, dense, wet
46-							
48-							
50-			R	45	20.8	105.9	
							@50' Light greenish gray coarse SAND, dense, wet
52-							
54-							
			S	52	27.7		@55' Changing to fine silty SAND
56-							
58-							
60-			R	35	24.8	104.1	
62-							
							End of boring @60'
64-							Ground water @8'
							Cave in @14'
s66-							
68-							
70-							
72-							
74-							
76-							
78-							
80-							
82-							
84-							
86-							
88-							

JOB NO.:103n-200-00 FIGURE: B-10

BAGAHI ENGINEERING

DATE OBSERVED: 2/2/2000

LOG OF BORING NO. B-5

LOCATION: See Plot Plan

LOGGED BY: SG

METHOD OF DRILLING: 5" Rotary Wash Auger

GROUND EL.: 2.5'±

DRILLING CONTRACTOR: A & W

HAMMER: 140 lb. SPT
400 lb sampler RING

FALLING: 30 inches
18 inches

Depth (ft.)	Soil Type	Sample Type		Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
		B			10.0		
2-							Light brown fine gravelly SAND, medium dense, moist
4-							
			S	2	33.8		@5' Dark gray fine silty SAND, loose, some shell fragments, moist
6-							
8-							
10-			R	3	29.9	94.5	
12-							
14-							
			S	21	28.6		@15' Becoming medium dense to dense, wet
16-							
18-							
20-			R	1	61.3	64.3	@20' Dark gray clayey SILT, soft, wet
22-							
24-							
			S	3	53.7		
26-							
28-							
30-			R	3	23.9	102.8	
32-							
34-							@35' Greenish gray sandy SILT , loose, wet
			S	6	22.7		
36-							@38' Greenish gray gravelly medium to coarse SAND, medium dense, wet
38-							
40-			R	45	12.5	122.4	
42-							
44-							

JOB NO.: 103n-200-00

FIGURE: B-11

BAGAHI ENGINEERING

DATE OBSERVED: 2/2/2000 **LOG OF BORING NO. B-5** LOCATION: See Plot Plan

LOGGED BY: SG METHOD OF DRILLING: 5" Rotary Wash Auger GROUND EL.: 2.5'±

DRILLING CONTRACTOR: A & W HAMMER: 140 lb SPT FALLING: 30 inches
400 lb RING 18 inches

Depth (ft.)	Soil Type	Sample Type	Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
44-						
46-		S	46	25.5		@45' Changing to fine SAND, medium dense to dense, wet
48-						
50-		R	27	29.4	95.6	
52-						
54-						
56-						
58-						
60-		R	45	25.6	97.5	
62-						@60' Greenish gray fine silty SAND, dense, wet
64-						
66-						
68-						
70-		R	30	30.3	93.0	@70' Dark gray silty SAND, medium dense, trace of organic matter, wet
72-						
74-						
76-						
78-						
80-		R	30	34.0	88.8	
82-						
84-						
86-						
88-						

JOB NO.: 103n-200-00 FIGURE: B-12

BAGAHI ENGINEERING

DATE OBSERVED: 2/2/2000 **LOG OF BORING NO. B-5** LOCATION: See Plot Plan

LOGGED BY: SG METHOD OF DRILLING: 5" Rotary Wash Auger GROUND EL.: 2.5'±

DRILLING CONTRACTOR: A & W HAMMER: 140 lb SPT FALLING: 30 inches
400 lb RING 18 inches

Depth (ft.)	Soil Type	Sample Type		Blows/ Foot	Field Moist. (%)	Field Density (pcf)	This log is part of the report prepared by Bagahi Engineering and should be read together with the report for complete interpretation. The summary applies only at the location of this boring and at the time of drilling. The data contained in this log is a simplification of actual conditions encountered.
90-		B	R	37	19.9	108.0	
92-							@90' Dark gray silty SAND, medium dense to dense, trace shell fragments, wet
94-							
96-							
98-							
100-			R	28	28.1	97.3	
102-							
104-							End of boring @100' Ground water @8' Cave in @15'
106-							
108-							Installed 15' of 2-inch PVC pipe monitoring well, 5' slotted, 10' feet solid
110-							
112-							
114-							
116-							
118-							
120-							
122-							
124-							
126-							
128-							
130-							
132-							
134-							

JOB NO.: 103n-200-00 FIGURE: B-13

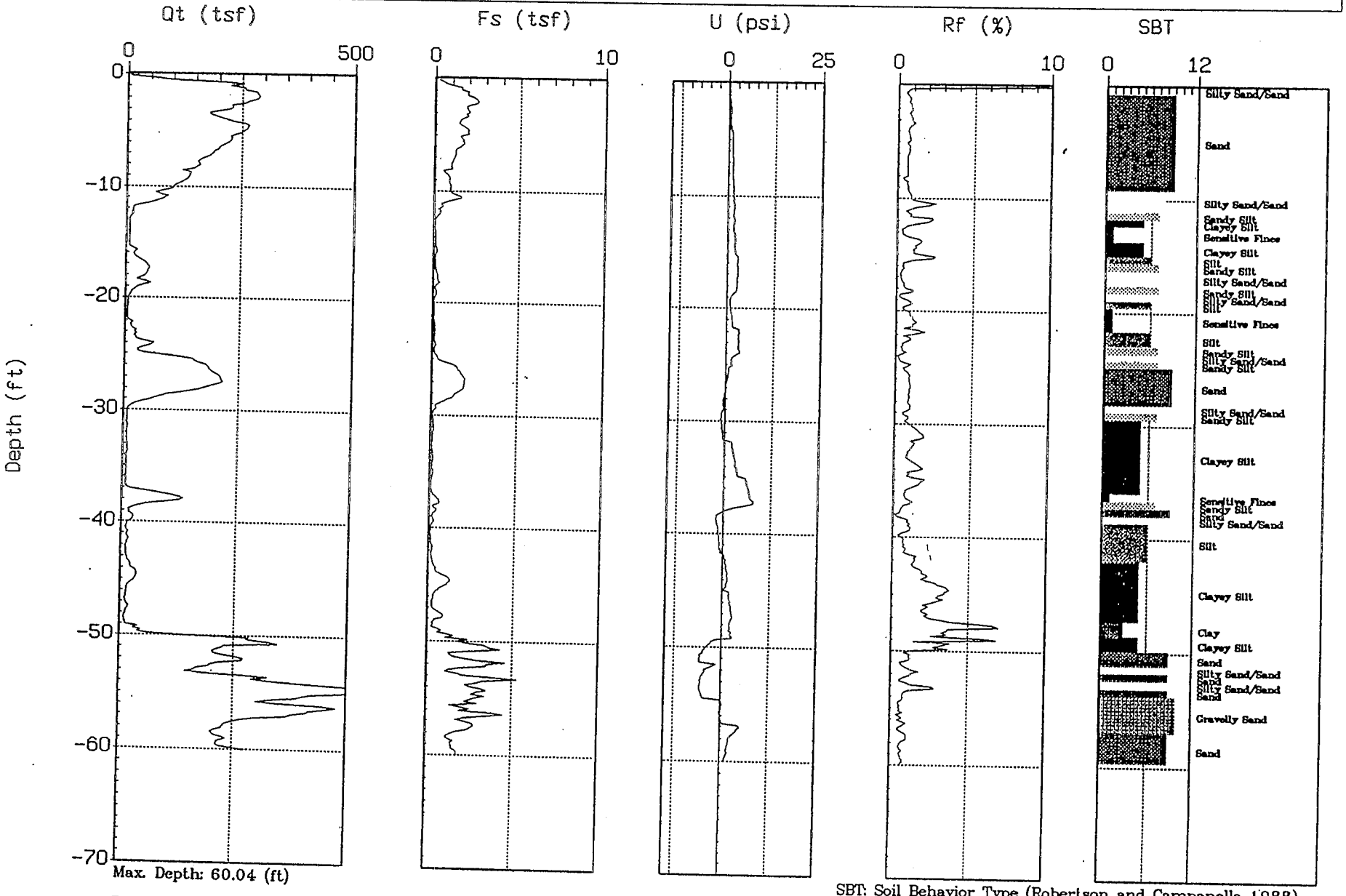
 BAGAHI ENGINEERING

GREGG

BAGAHI ENGINEERING

Site : WOODFIN HOTEL
Location : CPT-1

ENGINEER : KEN BAGAHI
Date : 02:01:00 10:46



Max. Depth: 60.04 (ft)
Depth Inc.: 0.164 (ft)

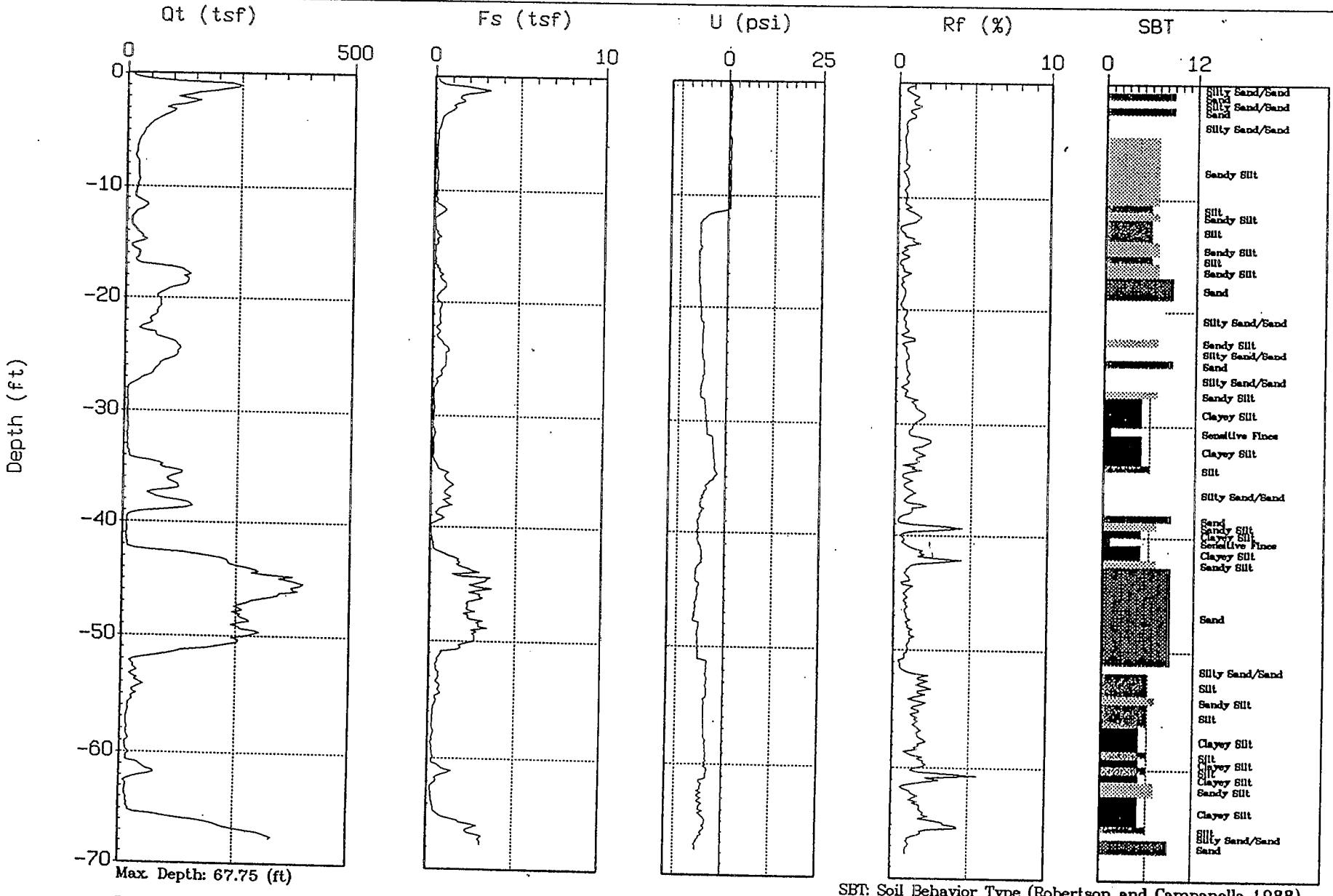
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

BAGAHI ENGINEERING

Site : WOODFIN HOTEL
Location : CPT-2

ENGINEER : KEN BAGAHI
Date : 02:01:00 11:19



Max. Depth: 67.75 (ft)

Depth Inc.: 0.164 (ft)

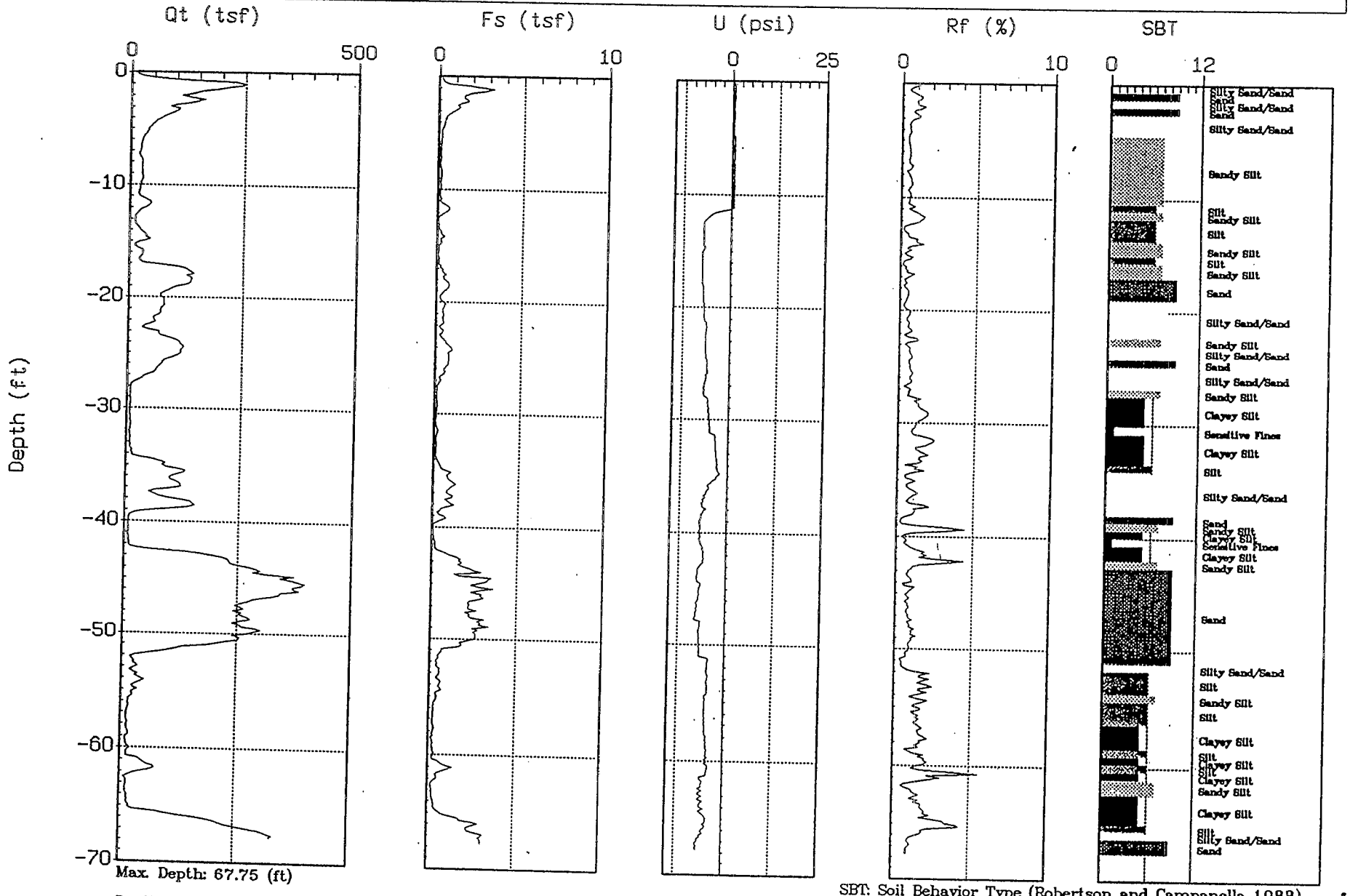
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

BAGAHI ENGINEERING

Site : WOODFIN HOTEL
Location : CPT-2

ENGINEER : KEN BAGAHI
Date : 02:01:00 11:19



Max. Depth: 67.75 (ft)

Depth Inc.: 0.164 (ft)

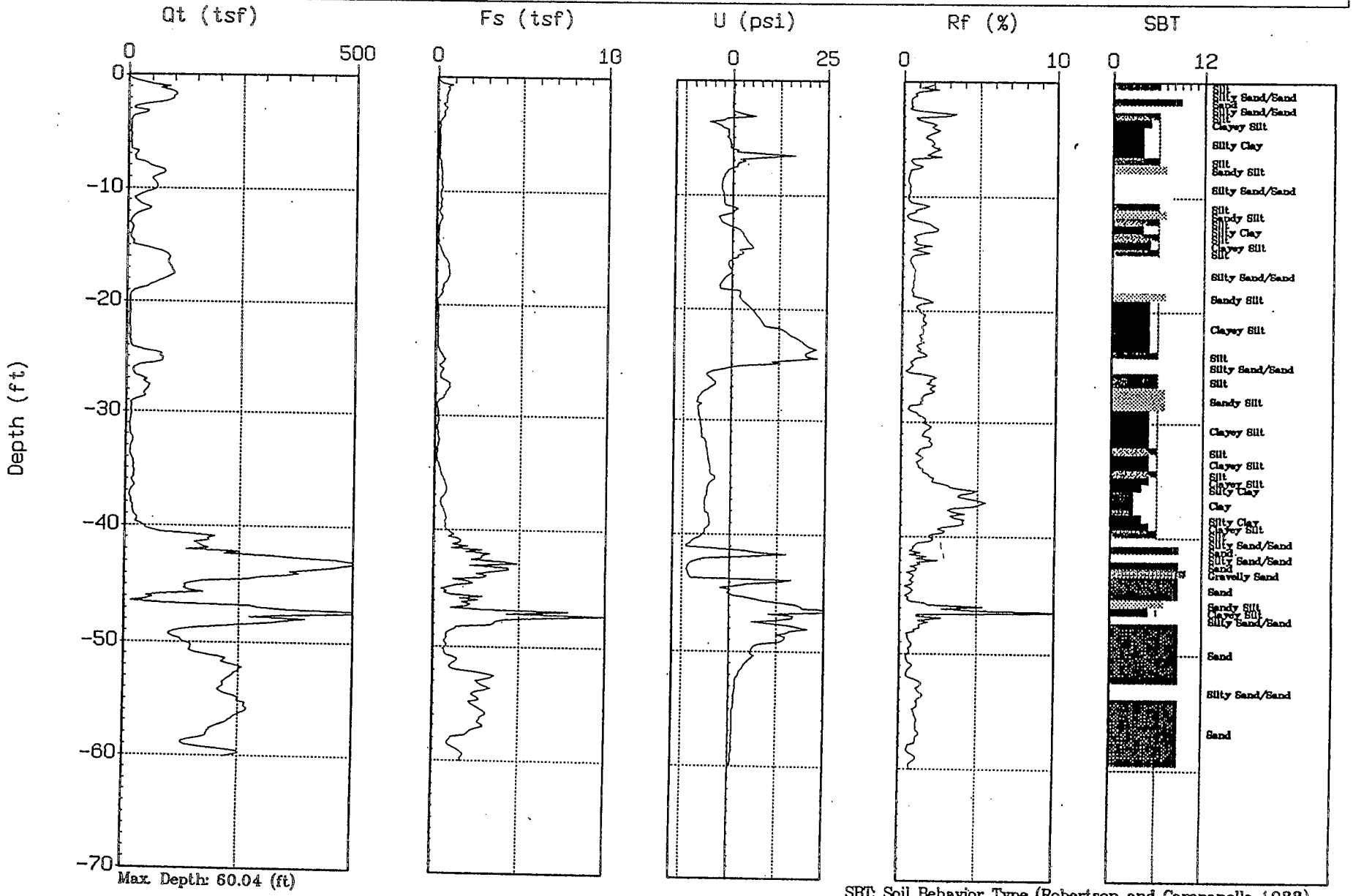
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

BAGAHI ENGINEERING

Site : WOODFIN HOTEL
Location : CPT-3

ENGINEER : KEN BAGAHI
Date : 02:01:00 12:20



Max. Depth: 60.04 (ft)

Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

APPENDIX C

LIQUEFACTION CALCULATION

APPENDIX C
LIQUEFACTION CALCULATION

LIQUEFACTION POTENTIAL AND SEISMIC SETTLEMENT

Evaluation of the liquefaction potential of the soils at the project location was performed using the Liquefaction Analysis Calculation Sheet developed by CivilTech Software. Cone Penetration Test (CPT) data, Standard Penetration Test (SPT) data, and blow count data obtained during sampling were converted to approximate SPT N-values and utilized in our analyses. The liquefaction potential was determined for the ground motion with a 10% probability of exceedence in 50 years, designated the design basis earthquake. This ground motion corresponds to a predominant earthquake magnitude of 7.1 and peak ground acceleration (PGA) of 0.5, as determined by the State Geologist[1] for alluvium conditions. Groundwater was encountered in our borings, and the published historic high groundwater depth is approximately 8 feet. For the liquefaction calculations, it was assumed the groundwater could rise to a depth of 8 feet below the ground surface. The liquefaction calculations for the 5 boring and the 2 CPT explorations are attached, pages 1 to 74.

[1] State of California Seismic Hazard Zone Map, Venice 7.5-Minute Quadrangle, dated March 25, 1999.

****

LIQUEFACTION ANALYSIS CALCULATION SHEET
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www.civiltech.com
(425) 453-6488 Fax (425) 453-5848

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Input File Name: E:\VB&B\Woodfin\Boring 1.liq
Title: Woodfin Suites
Subtitle: B-1

Surface Elev.=13
Hole No.=B-1
Depth of Hole= 50.0 ft
Water Table during Earthquake= 8.0 ft
Water Table during In-Situ Testing= 14.0 ft
Max. Acceleration= 0.5 g
Earthquake Magnitude= 7.1

Input Data:

Surface Elev.=13
Hole No.=B-1
Depth of Hole=50.0 ft
Water Table during Earthquake= 8.0 ft
Water Table during In-Situ Testing= 14.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=7.1

Earthquake Magnitude=7.1
2. Settlement Analysis Method: Ishihara / Yoshimine*
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1
7. Borehole Diameter, Cb= 1.15
8. Sampeling Method, Cs= 1
9. User request factor of safty (apply to CSR) , User= 1.2
Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.0	17.0	100.0	NoLiq
1.0	17.0	100.0	NoLiq
2.0	18.0	100.0	NoLiq
5.0	13.0	100.0	NoLiq
8.0	14.0	100.0	NoLiq
10.0	6.0	100.0	NoLiq
11.0	6.0	100.0	NoLiq
12.0	6.0	100.0	NoLiq
14.0	6.0	100.0	NoLiq
16.0	5.0	110.0	17.0
18.0	11.0	110.0	17.0
20.0	4.0	110.0	17.0
22.0	13.0	110.0	17.0
24.0	29.0	110.0	17.0
26.0	29.0	110.0	NoLiq
29.0	29.0	110.0	NoLiq
32.0	6.0	110.0	22.0
34.0	6.0	110.0	22.0
39.0	28.0	120.0	33.0
44.0	28.0	120.0	33.0
49.0	38.0	120.0	33.0

Output Results:

Settlement of saturated sands=4.31 in.
Settlement of dry sands=0.00 in.
Total settlement of saturated and dry sands=4.31 in.
Differential Settlement=2.157 to 2.848 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.00	0.32	5.00	4.31	0.00	4.31
0.05	2.00	0.32	5.00	4.31	0.00	4.31
0.10	2.00	0.32	5.00	4.31	0.00	4.31
0.15	2.00	0.32	5.00	4.31	0.00	4.31
0.20	2.00	0.32	5.00	4.31	0.00	4.31
0.25	2.00	0.32	5.00	4.31	0.00	4.31
0.30	2.00	0.32	5.00	4.31	0.00	4.31
0.35	2.00	0.32	5.00	4.31	0.00	4.31
0.40	2.00	0.32	5.00	4.31	0.00	4.31
0.45	2.00	0.32	5.00	4.31	0.00	4.31
0.50	2.00	0.32	5.00	4.31	0.00	4.31
0.55	2.00	0.32	5.00	4.31	0.00	4.31
0.60	2.00	0.32	5.00	4.31	0.00	4.31
0.65	2.00	0.32	5.00	4.31	0.00	4.31
0.70	2.00	0.32	5.00	4.31	0.00	4.31
0.75	2.00	0.32	5.00	4.31	0.00	4.31
0.80	2.00	0.32	5.00	4.31	0.00	4.31
0.85	2.00	0.32	5.00	4.31	0.00	4.31
0.90	2.00	0.32	5.00	4.31	0.00	4.31
0.95	2.00	0.32	5.00	4.31	0.00	4.31
1.00	2.00	0.32	5.00	4.31	0.00	4.31
1.05	2.00	0.32	5.00	4.31	0.00	4.31
1.10	2.00	0.32	5.00	4.31	0.00	4.31
1.15	2.00	0.32	5.00	4.31	0.00	4.31
1.20	2.00	0.32	5.00	4.31	0.00	4.31
1.25	2.00	0.32	5.00	4.31	0.00	4.31
1.30	2.00	0.32	5.00	4.31	0.00	4.31
1.35	2.00	0.32	5.00	4.31	0.00	4.31
1.40	2.00	0.32	5.00	4.31	0.00	4.31
1.45	2.00	0.32	5.00	4.31	0.00	4.31
1.50	2.00	0.32	5.00	4.31	0.00	4.31
1.55	2.00	0.32	5.00	4.31	0.00	4.31
1.60	2.00	0.32	5.00	4.31	0.00	4.31
1.65	2.00	0.32	5.00	4.31	0.00	4.31
1.70	2.00	0.32	5.00	4.31	0.00	4.31
1.75	2.00	0.32	5.00	4.31	0.00	4.31
1.80	2.00	0.32	5.00	4.31	0.00	4.31
1.85	2.00	0.32	5.00	4.31	0.00	4.31
1.90	2.00	0.32	5.00	4.31	0.00	4.31
1.95	2.00	0.32	5.00	4.31	0.00	4.31
2.00	2.00	0.32	5.00	4.31	0.00	4.31
2.05	2.00	0.32	5.00	4.31	0.00	4.31
2.10	2.00	0.32	5.00	4.31	0.00	4.31
2.15	2.00	0.32	5.00	4.31	0.00	4.31
2.20	2.00	0.32	5.00	4.31	0.00	4.31
2.25	2.00	0.32	5.00	4.31	0.00	4.31
2.30	2.00	0.32	5.00	4.31	0.00	4.31
2.35	2.00	0.32	5.00	4.31	0.00	4.31
2.40	2.00	0.32	5.00	4.31	0.00	4.31
2.45	2.00	0.32	5.00	4.31	0.00	4.31

2.50	2.00	0.32	5.00	4.31	0.00	4.31
2.55	2.00	0.32	5.00	4.31	0.00	4.31
2.60	2.00	0.32	5.00	4.31	0.00	4.31
2.65	2.00	0.32	5.00	4.31	0.00	4.31
2.70	2.00	0.32	5.00	4.31	0.00	4.31
2.75	2.00	0.32	5.00	4.31	0.00	4.31
2.80	2.00	0.32	5.00	4.31	0.00	4.31
2.85	2.00	0.32	5.00	4.31	0.00	4.31
2.90	2.00	0.32	5.00	4.31	0.00	4.31
2.95	2.00	0.32	5.00	4.31	0.00	4.31
3.00	2.00	0.32	5.00	4.31	0.00	4.31
3.05	2.00	0.32	5.00	4.31	0.00	4.31
3.10	2.00	0.32	5.00	4.31	0.00	4.31
3.15	2.00	0.32	5.00	4.31	0.00	4.31
3.20	2.00	0.32	5.00	4.31	0.00	4.31
3.25	2.00	0.32	5.00	4.31	0.00	4.31
3.30	2.00	0.32	5.00	4.31	0.00	4.31
3.35	2.00	0.32	5.00	4.31	0.00	4.31
3.40	2.00	0.32	5.00	4.31	0.00	4.31
3.45	2.00	0.32	5.00	4.31	0.00	4.31
3.50	2.00	0.32	5.00	4.31	0.00	4.31
3.55	2.00	0.32	5.00	4.31	0.00	4.31
3.60	2.00	0.32	5.00	4.31	0.00	4.31
3.65	2.00	0.32	5.00	4.31	0.00	4.31
3.70	2.00	0.32	5.00	4.31	0.00	4.31
3.75	2.00	0.32	5.00	4.31	0.00	4.31
3.80	2.00	0.32	5.00	4.31	0.00	4.31
3.85	2.00	0.32	5.00	4.31	0.00	4.31
3.90	2.00	0.32	5.00	4.31	0.00	4.31
3.95	2.00	0.32	5.00	4.31	0.00	4.31
4.00	2.00	0.32	5.00	4.31	0.00	4.31
4.05	2.00	0.32	5.00	4.31	0.00	4.31
4.10	2.00	0.32	5.00	4.31	0.00	4.31
4.15	2.00	0.32	5.00	4.31	0.00	4.31
4.20	2.00	0.32	5.00	4.31	0.00	4.31
4.25	2.00	0.32	5.00	4.31	0.00	4.31
4.30	2.00	0.32	5.00	4.31	0.00	4.31
4.35	2.00	0.32	5.00	4.31	0.00	4.31
4.40	2.00	0.32	5.00	4.31	0.00	4.31
4.45	2.00	0.32	5.00	4.31	0.00	4.31
4.50	2.00	0.32	5.00	4.31	0.00	4.31
4.55	2.00	0.32	5.00	4.31	0.00	4.31
4.60	2.00	0.32	5.00	4.31	0.00	4.31
4.65	2.00	0.32	5.00	4.31	0.00	4.31
4.70	2.00	0.32	5.00	4.31	0.00	4.31
4.75	2.00	0.32	5.00	4.31	0.00	4.31
4.80	2.00	0.32	5.00	4.31	0.00	4.31
4.85	2.00	0.32	5.00	4.31	0.00	4.31
4.90	2.00	0.32	5.00	4.31	0.00	4.31
4.95	2.00	0.32	5.00	4.31	0.00	4.31
5.00	2.00	0.32	5.00	4.31	0.00	4.31
5.05	2.00	0.32	5.00	4.31	0.00	4.31
5.10	2.00	0.32	5.00	4.31	0.00	4.31
5.15	2.00	0.32	5.00	4.31	0.00	4.31
5.20	2.00	0.32	5.00	4.31	0.00	4.31
5.25	2.00	0.32	5.00	4.31	0.00	4.31
5.30	2.00	0.32	5.00	4.31	0.00	4.31
5.35	2.00	0.32	5.00	4.31	0.00	4.31
5.40	2.00	0.32	5.00	4.31	0.00	4.31
5.45	2.00	0.32	5.00	4.31	0.00	4.31
5.50	2.00	0.32	5.00	4.31	0.00	4.31
5.55	2.00	0.32	5.00	4.31	0.00	4.31
5.60	2.00	0.32	5.00	4.31	0.00	4.31
5.65	2.00	0.32	5.00	4.31	0.00	4.31
5.70	2.00	0.32	5.00	4.31	0.00	4.31
5.75	2.00	0.32	5.00	4.31	0.00	4.31
5.80	2.00	0.32	5.00	4.31	0.00	4.31
5.85	2.00	0.32	5.00	4.31	0.00	4.31
5.90	2.00	0.32	5.00	4.31	0.00	4.31
5.95	2.00	0.32	5.00	4.31	0.00	4.31
6.00	2.00	0.32	5.00	4.31	0.00	4.31
6.05	2.00	0.32	5.00	4.31	0.00	4.31
6.10	2.00	0.32	5.00	4.31	0.00	4.31
6.15	2.00	0.32	5.00	4.31	0.00	4.31
6.20	2.00	0.32	5.00	4.31	0.00	4.31
6.25	2.00	0.32	5.00	4.31	0.00	4.31
6.30	2.00	0.32	5.00	4.31	0.00	4.31
6.35	2.00	0.32	5.00	4.31	0.00	4.31
6.40	2.00	0.32	5.00	4.31	0.00	4.31
6.45	2.00	0.32	5.00	4.31	0.00	4.31
6.50	2.00	0.32	5.00	4.31	0.00	4.31
6.55	2.00	0.32	5.00	4.31	0.00	4.31
6.60	2.00	0.32	5.00	4.31	0.00	4.31
6.65	2.00	0.32	5.00	4.31	0.00	4.31
6.70	2.00	0.32	5.00	4.31	0.00	4.31
6.75	2.00	0.32	5.00	4.31	0.00	4.31
6.80	2.00	0.32	5.00	4.31	0.00	4.31
6.85	2.00	0.32	5.00	4.31	0.00	4.31
6.90	2.00	0.32	5.00	4.31	0.00	4.31
6.95	2.00	0.32	5.00	4.31	0.00	4.31
7.00	2.00	0.32	5.00	4.31	0.00	4.31
7.05	2.00	0.32	5.00	4.31	0.00	4.31
7.10	2.00	0.32	5.00	4.31	0.00	4.31
7.15	2.00	0.32	5.00	4.31	0.00	4.31
7.20	2.00	0.32	5.00	4.31	0.00	4.31
7.25	2.00	0.32	5.00	4.31	0.00	4.31
7.30	2.00	0.32	5.00	4.31	0.00	4.31
7.35	2.00	0.32	5.00	4.31	0.00	4.31
7.40	2.00	0.32	5.00	4.31	0.00	4.31
7.45	2.00	0.32	5.00	4.31	0.00	4.31
7.50	2.00	0.32	5.00	4.31	0.00	4.31
7.55	2.00	0.32	5.00	4.31	0.00	4.31
7.60	2.00	0.32	5.00	4.31	0.00	4.31
7.65	2.00	0.32	5.00	4.31	0.00	4.31
7.70	2.00	0.32	5.00	4.31	0.00	4.31
7.75	2.00	0.32	5.00	4.31	0.00	4.31
7.80	2.00	0.32	5.00	4.31	0.00	4.31
7.85	2.00	0.32	5.00	4.31	0.00	4.31
7.90	2.00	0.32	5.00	4.31	0.00	4.31
7.95	2.00	0.32	5.00	4.31	0.00	4.31
8.00	2.00	0.32	5.00	4.31	0.00	4.31
8.05	2.00	0.32	5.00	4.31	0.00	4.31
8.10	2.00	0.32	5.00	4.31	0.00	4.31
8.15	2.00	0.32	5.00	4.31	0.00	4.31
8.20	2.00	0.32	5.00	4.31	0.00	4.31
8.25	2.00	0.32	5.00	4.31	0.00	4.31
8.30	2.00	0.33	5.00	4.31	0.00	4.31
8.35	2.00	0.33	5.00	4.31	0.00	4.31
8.40	2.00	0.33	5.00	4.31	0.00	4.31
8.45	2.00	0.33	5.00	4.31	0.00	4.31
8.50	2.00	0.33	5.00	4.31	0.00	4.31
8.55	2.00	0.33	5.00	4.31	0.00	4.31
8.60	2.00	0.33	5.00	4.31	0.00	4.31
8.65	2.00	0.33	5.00	4.31	0.00	4.31
8.70	2.00	0.34	5.00	4.31	0.00	4.31
8.75	2.00	0.34	5.00	4.31	0.00	4.31
8.80	2.00	0.34	5.00	4.31	0.00	4.31
8.85	2.00	0.34	5.00	4.31	0.00	4.31
8.90	2.00	0.34	5.00	4.31	0.00	4.31
8.95	2.00	0.34	5.00	4.31	0.00	4.31
9.00	2.00	0.34	5.00	4.31	0.00	4.31
9.05	2.00	0.34	5.00	4.31	0.00	4.31
9.10	2.00	0.34	5.00	4.31	0.00	4.31
9.15	2.00	0.35	5.00	4.31	0.00	4.31
9.20	2.00	0.35	5.00	4.31	0.00	4.31
9.25	2.00	0.35	5.00	4.31	0.00	4.31
9.30	2.00	0.35	5.00	4.31	0.00	4.31
9.35	2.00	0.35	5.00	4.31	0.00	4.31

9.40	2.00	0.35	5.00	4.31	0.00	4.31
9.45	2.00	0.35	5.00	4.31	0.00	4.31
9.50	2.00	0.35	5.00	4.31	0.00	4.31
9.55	2.00	0.35	5.00	4.31	0.00	4.31
9.60	2.00	0.35	5.00	4.31	0.00	4.31
9.65	2.00	0.36	5.00	4.31	0.00	4.31
9.70	2.00	0.36	5.00	4.31	0.00	4.31
9.75	2.00	0.36	5.00	4.31	0.00	4.31
9.80	2.00	0.36	5.00	4.31	0.00	4.31
9.85	2.00	0.36	5.00	4.31	0.00	4.31
9.90	2.00	0.36	5.00	4.31	0.00	4.31
9.95	2.00	0.36	5.00	4.31	0.00	4.31
10.00	2.00	0.36	5.00	4.31	0.00	4.31
10.05	2.00	0.36	5.00	4.31	0.00	4.31
10.10	2.00	0.36	5.00	4.31	0.00	4.31
10.15	2.00	0.37	5.00	4.31	0.00	4.31
10.20	2.00	0.37	5.00	4.31	0.00	4.31
10.25	2.00	0.37	5.00	4.31	0.00	4.31
10.30	2.00	0.37	5.00	4.31	0.00	4.31
10.35	2.00	0.37	5.00	4.31	0.00	4.31
10.40	2.00	0.37	5.00	4.31	0.00	4.31
10.45	2.00	0.37	5.00	4.31	0.00	4.31
10.50	2.00	0.37	5.00	4.31	0.00	4.31
10.55	2.00	0.37	5.00	4.31	0.00	4.31
10.60	2.00	0.37	5.00	4.31	0.00	4.31
10.65	2.00	0.38	5.00	4.31	0.00	4.31
10.70	2.00	0.38	5.00	4.31	0.00	4.31
10.75	2.00	0.38	5.00	4.31	0.00	4.31
10.80	2.00	0.38	5.00	4.31	0.00	4.31
10.85	2.00	0.38	5.00	4.31	0.00	4.31
10.90	2.00	0.38	5.00	4.31	0.00	4.31
10.95	2.00	0.38	5.00	4.31	0.00	4.31
11.00	2.00	0.38	5.00	4.31	0.00	4.31
11.05	2.00	0.38	5.00	4.31	0.00	4.31
11.10	2.00	0.38	5.00	4.31	0.00	4.31
11.15	2.00	0.38	5.00	4.31	0.00	4.31
11.20	2.00	0.39	5.00	4.31	0.00	4.31
11.25	2.00	0.39	5.00	4.31	0.00	4.31
11.30	2.00	0.39	5.00	4.31	0.00	4.31
11.35	2.00	0.39	5.00	4.31	0.00	4.31
11.40	2.00	0.39	5.00	4.31	0.00	4.31
11.45	2.00	0.39	5.00	4.31	0.00	4.31
11.50	2.00	0.39	5.00	4.31	0.00	4.31
11.55	2.00	0.39	5.00	4.31	0.00	4.31
11.60	2.00	0.39	5.00	4.31	0.00	4.31
11.65	2.00	0.39	5.00	4.31	0.00	4.31
11.70	2.00	0.39	5.00	4.31	0.00	4.31
11.75	2.00	0.39	5.00	4.31	0.00	4.31
11.80	2.00	0.40	5.00	4.31	0.00	4.31
11.85	2.00	0.40	5.00	4.31	0.00	4.31
11.90	2.00	0.40	5.00	4.31	0.00	4.31
11.95	2.00	0.40	5.00	4.31	0.00	4.31
12.00	2.00	0.40	5.00	4.31	0.00	4.31
12.05	2.00	0.40	5.00	4.31	0.00	4.31
12.10	2.00	0.40	5.00	4.31	0.00	4.31
12.15	2.00	0.40	5.00	4.31	0.00	4.31
12.20	2.00	0.40	5.00	4.31	0.00	4.31
12.25	2.00	0.40	5.00	4.31	0.00	4.31
12.30	2.00	0.40	5.00	4.31	0.00	4.31
12.35	2.00	0.40	5.00	4.31	0.00	4.31
12.40	2.00	0.41	5.00	4.31	0.00	4.31
12.45	2.00	0.41	5.00	4.31	0.00	4.31
12.50	2.00	0.41	5.00	4.31	0.00	4.31
12.55	2.00	0.41	5.00	4.31	0.00	4.31
12.60	2.00	0.41	5.00	4.31	0.00	4.31
12.65	2.00	0.41	5.00	4.31	0.00	4.31
12.70	2.00	0.41	5.00	4.31	0.00	4.31
12.75	2.00	0.41	5.00	4.31	0.00	4.31
12.80	2.00	0.41	5.00	4.31	0.00	4.31
12.85	2.00	0.41	5.00	4.31	0.00	4.31
12.90	2.00	0.41	5.00	4.31	0.00	4.31
12.95	2.00	0.41	5.00	4.31	0.00	4.31
13.00	2.00	0.41	5.00	4.31	0.00	4.31
13.05	2.00	0.42	5.00	4.31	0.00	4.31
13.10	2.00	0.42	5.00	4.31	0.00	4.31
13.15	2.00	0.42	5.00	4.31	0.00	4.31
13.20	2.00	0.42	5.00	4.31	0.00	4.31
13.25	2.00	0.42	5.00	4.31	0.00	4.31
13.30	2.00	0.42	5.00	4.31	0.00	4.31
13.35	2.00	0.42	5.00	4.31	0.00	4.31
13.40	2.00	0.42	5.00	4.31	0.00	4.31
13.45	2.00	0.42	5.00	4.31	0.00	4.31
13.50	2.00	0.42	5.00	4.31	0.00	4.31
13.55	2.00	0.42	5.00	4.31	0.00	4.31
13.60	2.00	0.42	5.00	4.31	0.00	4.31
13.65	2.00	0.42	5.00	4.31	0.00	4.31
13.70	2.00	0.42	5.00	4.31	0.00	4.31
13.75	2.00	0.43	5.00	4.31	0.00	4.31
13.80	2.00	0.43	5.00	4.31	0.00	4.31
13.85	2.00	0.43	5.00	4.31	0.00	4.31
13.90	2.00	0.43	5.00	4.31	0.00	4.31
13.95	2.00	0.43	5.00	4.31	0.00	4.31
14.00	2.00	0.43	5.00	4.31	0.00	4.31
14.05	2.00	0.43	5.00	4.31	0.00	4.31
14.10	2.00	0.43	5.00	4.31	0.00	4.31
14.15	2.00	0.43	5.00	4.31	0.00	4.31
14.20	2.00	0.43	5.00	4.31	0.00	4.31
14.25	2.00	0.43	5.00	4.31	0.00	4.31
14.30	2.00	0.43	5.00	4.31	0.00	4.31
14.35	2.00	0.43	5.00	4.31	0.00	4.31
14.40	2.00	0.43	5.00	4.31	0.00	4.31
14.45	2.00	0.44	5.00	4.31	0.00	4.31
14.50	2.00	0.44	5.00	4.31	0.00	4.31
14.55	2.00	0.44	5.00	4.31	0.00	4.31
14.60	2.00	0.44	5.00	4.31	0.00	4.31
14.65	2.00	0.44	5.00	4.31	0.00	4.31
14.70	2.00	0.44	5.00	4.31	0.00	4.31
14.75	2.00	0.44	5.00	4.31	0.00	4.31
14.80	2.00	0.44	5.00	4.31	0.00	4.31
14.85	2.00	0.44	5.00	4.31	0.00	4.31
14.90	2.00	0.44	5.00	4.31	0.00	4.31
14.95	2.00	0.44	5.00	4.31	0.00	4.31
15.00	2.00	0.44	5.00	4.31	0.00	4.31
15.05	2.00	0.44	5.00	4.31	0.00	4.31
15.10	2.00	0.44	5.00	4.31	0.00	4.31
15.15	2.00	0.44	5.00	4.31	0.00	4.31
15.20	2.00	0.44	5.00	4.31	0.00	4.31
15.25	2.00	0.45	5.00	4.31	0.00	4.31
15.30	2.00	0.45	5.00	4.31	0.00	4.31
15.35	2.00	0.45	5.00	4.31	0.00	4.31
15.40	2.00	0.45	5.00	4.31	0.00	4.31
15.45	2.00	0.45	5.00	4.31	0.00	4.31
15.50	2.00	0.45	5.00	4.31	0.00	4.31
15.55	2.00	0.45	5.00	4.31	0.00	4.31
15.60	2.00	0.45	5.00	4.31	0.00	4.31
15.65	2.00	0.45	5.00	4.31	0.00	4.31
15.70	2.00	0.45	5.00	4.31	0.00	4.31
15.75	2.00	0.45	5.00	4.31	0.00	4.31
15.80	2.00	0.45	5.00	4.31	0.00	4.31
15.85	2.00	0.45	5.00	4.31	0.00	4.31
15.90	2.00	0.45	5.00	4.31	0.00	4.31
15.95	2.00	0.45	5.00	4.31	0.00	4.31
16.00	0.12	0.45	0.25*	4.31	0.00	4.31
16.05	0.12	0.45	0.26*	4.29	0.00	4.29
16.10	0.12	0.45	0.26*	4.27	0.00	4.27
16.15	0.12	0.46	0.27*	4.25	0.00	4.25
16.20	0.12	0.46	0.27*	4.23	0.00	4.23
16.25	0.13	0.46	0.28*	4.21	0.00	4.21

16.30	0.13	0.46	0.28*	4.19	0.00	4.19
16.35	0.13	0.46	0.29*	4.17	0.00	4.17
16.40	0.13	0.46	0.29*	4.15	0.00	4.15
16.45	0.14	0.46	0.30*	4.13	0.00	4.13
16.50	0.14	0.46	0.30*	4.11	0.00	4.11
16.55	0.14	0.46	0.30*	4.09	0.00	4.09
16.60	0.14	0.46	0.31*	4.07	0.00	4.07
16.65	0.14	0.46	0.31*	4.05	0.00	4.05
16.70	0.15	0.46	0.32*	4.03	0.00	4.03
16.75	0.15	0.46	0.32*	4.01	0.00	4.01
16.80	0.15	0.46	0.33*	3.99	0.00	3.99
16.85	0.15	0.46	0.33*	3.97	0.00	3.97
16.90	0.16	0.46	0.34*	3.95	0.00	3.95
16.95	0.16	0.46	0.34*	3.93	0.00	3.93
17.00	0.16	0.46	0.35*	3.92	0.00	3.92
17.05	0.16	0.46	0.35*	3.90	0.00	3.90
17.10	0.16	0.46	0.35*	3.88	0.00	3.88
17.15	0.17	0.46	0.36*	3.86	0.00	3.86
17.20	0.17	0.47	0.36*	3.84	0.00	3.84
17.25	0.17	0.47	0.37*	3.83	0.00	3.83
17.30	0.17	0.47	0.37*	3.81	0.00	3.81
17.35	0.18	0.47	0.38*	3.79	0.00	3.79
17.40	0.18	0.47	0.38*	3.77	0.00	3.77
17.45	0.18	0.47	0.39*	3.76	0.00	3.76
17.50	0.18	0.47	0.39*	3.74	0.00	3.74
17.55	0.18	0.47	0.39*	3.72	0.00	3.72
17.60	0.19	0.47	0.40*	3.71	0.00	3.71
17.65	0.19	0.47	0.40*	3.69	0.00	3.69
17.70	0.19	0.47	0.41*	3.68	0.00	3.68
17.75	0.19	0.47	0.41*	3.66	0.00	3.66
17.80	0.20	0.47	0.41*	3.64	0.00	3.64
17.85	0.20	0.47	0.42*	3.63	0.00	3.63
17.90	0.20	0.47	0.42*	3.61	0.00	3.61
17.95	0.20	0.47	0.43*	3.60	0.00	3.60
18.00	0.20	0.47	0.43*	3.58	0.00	3.58
18.05	0.20	0.47	0.42*	3.57	0.00	3.57
18.10	0.20	0.47	0.42*	3.55	0.00	3.55
18.15	0.20	0.47	0.41*	3.53	0.00	3.53
18.20	0.19	0.47	0.41*	3.52	0.00	3.52
18.25	0.19	0.47	0.40*	3.50	0.00	3.50
18.30	0.19	0.48	0.39*	3.49	0.00	3.49
18.35	0.18	0.48	0.39*	3.47	0.00	3.47
18.40	0.18	0.48	0.38*	3.45	0.00	3.45
18.45	0.18	0.48	0.38*	3.44	0.00	3.44
18.50	0.18	0.48	0.37*	3.42	0.00	3.42
18.55	0.17	0.48	0.36*	3.40	0.00	3.40
18.60	0.17	0.48	0.36*	3.39	0.00	3.39
18.65	0.17	0.48	0.35*	3.37	0.00	3.37
18.70	0.17	0.48	0.35*	3.35	0.00	3.35
18.75	0.16	0.48	0.34*	3.33	0.00	3.33
18.80	0.16	0.48	0.33*	3.32	0.00	3.32
18.85	0.16	0.48	0.33*	3.30	0.00	3.30
18.90	0.15	0.48	0.32*	3.28	0.00	3.28
18.95	0.15	0.48	0.32*	3.26	0.00	3.26
19.00	0.15	0.48	0.31*	3.24	0.00	3.24
19.05	0.15	0.48	0.30*	3.22	0.00	3.22
19.10	0.14	0.48	0.30*	3.20	0.00	3.20
19.15	0.14	0.48	0.29*	3.18	0.00	3.18
19.20	0.14	0.48	0.29*	3.16	0.00	3.16
19.25	0.14	0.48	0.28*	3.14	0.00	3.14
19.30	0.13	0.48	0.27*	3.12	0.00	3.12
19.35	0.13	0.48	0.27*	3.10	0.00	3.10
19.40	0.13	0.48	0.26*	3.08	0.00	3.08
19.45	0.12	0.48	0.26*	3.06	0.00	3.06
19.50	0.12	0.48	0.25*	3.04	0.00	3.04
19.55	0.12	0.48	0.25*	3.02	0.00	3.02
19.60	0.12	0.49	0.24*	3.00	0.00	3.00
19.65	0.11	0.49	0.24*	2.98	0.00	2.98
19.70	0.11	0.49	0.23*	2.96	0.00	2.96
19.75	0.11	0.49	0.23*	2.93	0.00	2.93
19.80	0.11	0.49	0.22*	2.91	0.00	2.91
19.85	0.11	0.49	0.22*	2.89	0.00	2.89
19.90	0.10	0.49	0.21*	2.86	0.00	2.86
19.95	0.10	0.49	0.21*	2.84	0.00	2.84
20.00	0.10	0.49	0.20*	2.82	0.00	2.82
20.05	0.10	0.49	0.21*	2.79	0.00	2.79
20.10	0.10	0.49	0.21*	2.77	0.00	2.77
20.15	0.11	0.49	0.22*	2.74	0.00	2.74
20.20	0.11	0.49	0.22*	2.72	0.00	2.72
20.25	0.11	0.49	0.23*	2.70	0.00	2.70
20.30	0.12	0.49	0.24*	2.68	0.00	2.68
20.35	0.12	0.49	0.24*	2.65	0.00	2.65
20.40	0.12	0.49	0.25*	2.63	0.00	2.63
20.45	0.13	0.49	0.25*	2.61	0.00	2.61
20.50	0.13	0.49	0.26*	2.59	0.00	2.59
20.55	0.13	0.49	0.27*	2.57	0.00	2.57
20.60	0.13	0.49	0.27*	2.55	0.00	2.55
20.65	0.14	0.49	0.28*	2.53	0.00	2.53
20.70	0.14	0.49	0.29*	2.51	0.00	2.51
20.75	0.14	0.49	0.29*	2.49	0.00	2.49
20.80	0.15	0.49	0.30*	2.47	0.00	2.47
20.85	0.15	0.49	0.31*	2.45	0.00	2.45
20.90	0.15	0.49	0.31*	2.43	0.00	2.43
20.95	0.16	0.49	0.32*	2.42	0.00	2.42
21.00	0.16	0.50	0.32*	2.40	0.00	2.40
21.05	0.16	0.50	0.33*	2.38	0.00	2.38
21.10	0.17	0.50	0.34*	2.36	0.00	2.36
21.15	0.17	0.50	0.34*	2.34	0.00	2.34
21.20	0.17	0.50	0.35*	2.33	0.00	2.33
21.25	0.18	0.50	0.36*	2.31	0.00	2.31
21.30	0.18	0.50	0.36*	2.29	0.00	2.29
21.35	0.18	0.50	0.37*	2.27	0.00	2.27
21.40	0.19	0.50	0.37*	2.26	0.00	2.26
21.45	0.19	0.50	0.38*	2.24	0.00	2.24
21.50	0.19	0.50	0.39*	2.23	0.00	2.23
21.55	0.20	0.50	0.39*	2.21	0.00	2.21
21.60	0.20	0.50	0.40*	2.19	0.00	2.19
21.65	0.20	0.50	0.40*	2.18	0.00	2.18
21.70	0.20	0.50	0.41*	2.16	0.00	2.16
21.75	0.21	0.50	0.42*	2.15	0.00	2.15
21.80	0.21	0.50	0.42*	2.13	0.00	2.13
21.85	0.21	0.50	0.43*	2.12	0.00	2.12
21.90	0.22	0.50	0.43*	2.10	0.00	2.10
21.95	0.22	0.50	0.44*	2.09	0.00	2.09
22.00	0.22	0.50	0.44*	2.07	0.00	2.07
22.05	0.23	0.50	0.46*	2.06	0.00	2.06
22.10	0.23	0.50	0.47*	2.04	0.00	2.04
22.15	0.24	0.50	0.48*	2.03	0.00	2.03
22.20	0.25	0.50	0.49*	2.02	0.00	2.02
22.25	0.25	0.50	0.50*	2.00	0.00	2.00
22.30	0.26	0.50	0.51*	1.99	0.00	1.99
22.35	0.26	0.50	0.52*	1.98	0.00	1.98
22.40	0.27	0.50	0.54*	1.97	0.00	1.97
22.45	0.28	0.50	0.55*	1.95	0.00	1.95
22.50	0.28	0.50	0.56*	1.94	0.00	1.94
22.55	0.29	0.50	0.58*	1.93	0.00	1.93
22.60	0.30	0.50	0.59*	1.92	0.00	1.92
22.65	0.30	0.51	0.60*	1.91	0.00	1.91
22.70	0.31	0.51	0.62*	1.90	0.00	1.90
22.75	0.32	0.51	0.63*	1.89	0.00	1.89
22.80	0.33	0.51	0.65*	1.88	0.00	1.88
22.85	0.34	0.51	0.67*	1.87	0.00	1.87
22.90	0.35	0.51	0.68*	1.86	0.00	1.86
22.95	0.36	0.51	0.70*	1.85	0.00	1.85
23.00	0.37	0.51	0.72*	1.84	0.00	1.84
23.05	0.38	0.51	0.74*	1.84	0.00	1.84
23.10	0.39	0.51	0.77*	1.83	0.00	1.83
23.15	0.40	0.51	0.79*	1.82	0.00	1.82

23.20	0.42	0.51	0.82*	1.82	0.00	1.82
23.25	0.44	0.51	0.86*	1.81	0.00	1.81
23.30	0.47	0.51	0.92*	1.81	0.00	1.81
23.35	0.53	0.51	1.05	1.80	0.00	1.80
23.40	2.30	0.51	4.52	1.80	0.00	1.80
23.45	2.30	0.51	4.52	1.80	0.00	1.80
23.50	2.30	0.51	4.51	1.80	0.00	1.80
23.55	2.30	0.51	4.51	1.80	0.00	1.80
23.60	2.30	0.51	4.51	1.80	0.00	1.80
23.65	2.30	0.51	4.51	1.80	0.00	1.80
23.70	2.30	0.51	4.50	1.80	0.00	1.80
23.75	2.30	0.51	4.50	1.80	0.00	1.80
23.80	2.30	0.51	4.50	1.80	0.00	1.80
23.85	2.30	0.51	4.50	1.80	0.00	1.80
23.90	2.30	0.51	4.50	1.80	0.00	1.80
23.95	2.30	0.51	4.49	1.80	0.00	1.80
24.00	2.30	0.51	4.49	1.80	0.00	1.80
24.05	2.30	0.51	4.49	1.80	0.00	1.80
24.10	2.30	0.51	4.49	1.80	0.00	1.80
24.15	2.30	0.51	4.48	1.80	0.00	1.80
24.20	2.30	0.51	4.48	1.80	0.00	1.80
24.25	2.30	0.51	4.48	1.80	0.00	1.80
24.30	2.30	0.51	4.48	1.80	0.00	1.80
24.35	2.30	0.51	4.48	1.80	0.00	1.80
24.40	2.30	0.51	4.47	1.80	0.00	1.80
24.45	2.30	0.51	4.47	1.80	0.00	1.80
24.50	2.30	0.51	4.47	1.80	0.00	1.80
24.55	2.30	0.51	4.47	1.80	0.00	1.80
24.60	2.30	0.52	4.47	1.80	0.00	1.80
24.65	2.30	0.52	4.46	1.80	0.00	1.80
24.70	2.30	0.52	4.46	1.80	0.00	1.80
24.75	2.30	0.52	4.46	1.80	0.00	1.80
24.80	2.30	0.52	4.46	1.80	0.00	1.80
24.85	2.30	0.52	4.46	1.80	0.00	1.80
24.90	2.30	0.52	4.45	1.80	0.00	1.80
24.95	2.30	0.52	4.45	1.80	0.00	1.80
25.00	2.30	0.52	4.45	1.80	0.00	1.80
25.05	2.30	0.52	4.45	1.80	0.00	1.80
25.10	2.30	0.52	4.45	1.80	0.00	1.80
25.15	2.30	0.52	4.44	1.80	0.00	1.80
25.20	2.30	0.52	4.44	1.80	0.00	1.80
25.25	2.30	0.52	4.44	1.80	0.00	1.80
25.30	2.30	0.52	4.44	1.80	0.00	1.80
25.35	2.30	0.52	4.44	1.80	0.00	1.80
25.40	2.30	0.52	4.43	1.80	0.00	1.80
25.45	2.30	0.52	4.43	1.80	0.00	1.80
25.50	2.30	0.52	4.43	1.80	0.00	1.80
25.55	2.30	0.52	4.43	1.80	0.00	1.80
25.60	2.30	0.52	4.43	1.80	0.00	1.80
25.65	2.30	0.52	4.42	1.80	0.00	1.80
25.70	2.30	0.52	4.42	1.80	0.00	1.80
25.75	2.30	0.52	4.42	1.80	0.00	1.80
25.80	2.30	0.52	4.42	1.80	0.00	1.80
25.85	2.30	0.52	4.42	1.80	0.00	1.80
25.90	2.30	0.52	4.42	1.80	0.00	1.80
25.95	2.30	0.52	4.41	1.80	0.00	1.80
26.00	2.30	0.52	4.41	1.80	0.00	1.80
26.05	2.00	0.52	5.00	1.80	0.00	1.80
26.10	2.00	0.52	5.00	1.80	0.00	1.80
26.15	2.00	0.52	5.00	1.80	0.00	1.80
26.20	2.00	0.52	5.00	1.80	0.00	1.80
26.25	2.00	0.52	5.00	1.80	0.00	1.80
26.30	2.00	0.52	5.00	1.80	0.00	1.80
26.35	2.00	0.52	5.00	1.80	0.00	1.80
26.40	2.00	0.52	5.00	1.80	0.00	1.80
26.45	2.00	0.52	5.00	1.80	0.00	1.80
26.50	2.00	0.52	5.00	1.80	0.00	1.80
26.55	2.00	0.52	5.00	1.80	0.00	1.80
26.60	2.00	0.52	5.00	1.80	0.00	-1.80

26.65	2.00	0.52	5.00	1.80	0.00	1.80
26.70	2.00	0.52	5.00	1.80	0.00	1.80
26.75	2.00	0.52	5.00	1.80	0.00	1.80
26.80	2.00	0.52	5.00	1.80	0.00	1.80
26.85	2.00	0.52	5.00	1.80	0.00	1.80
26.90	2.00	0.53	5.00	1.80	0.00	1.80
26.95	2.00	0.53	5.00	1.80	0.00	1.80
27.00	2.00	0.53	5.00	1.80	0.00	1.80
27.05	2.00	0.53	5.00	1.80	0.00	1.80
27.10	2.00	0.53	5.00	1.80	0.00	1.80
27.15	2.00	0.53	5.00	1.80	0.00	1.80
27.20	2.00	0.53	5.00	1.80	0.00	1.80
27.25	2.00	0.53	5.00	1.80	0.00	1.80
27.30	2.00	0.53	5.00	1.80	0.00	1.80
27.35	2.00	0.53	5.00	1.80	0.00	1.80
27.40	2.00	0.53	5.00	1.80	0.00	1.80
27.45	2.00	0.53	5.00	1.80	0.00	1.80
27.50	2.00	0.53	5.00	1.80	0.00	1.80
27.55	2.00	0.53	5.00	1.80	0.00	1.80
27.60	2.00	0.53	5.00	1.80	0.00	1.80
27.65	2.00	0.53	5.00	1.80	0.00	1.80
27.70	2.00	0.53	5.00	1.80	0.00	1.80
27.75	2.00	0.53	5.00	1.80	0.00	1.80
27.80	2.00	0.53	5.00	1.80	0.00	1.80
27.85	2.00	0.53	5.00	1.80	0.00	1.80
27.90	2.00	0.53	5.00	1.80	0.00	1.80
27.95	2.00	0.53	5.00	1.80	0.00	1.80
28.00	2.00	0.53	5.00	1.80	0.00	1.80
28.05	2.00	0.53	5.00	1.80	0.00	1.80
28.10	2.00	0.53	5.00	1.80	0.00	1.80
28.15	2.00	0.53	5.00	1.80	0.00	1.80
28.20	2.00	0.53	5.00	1.80	0.00	1.80
28.25	2.00	0.53	5.00	1.80	0.00	1.80
28.30	2.00	0.53	5.00	1.80	0.00	1.80
28.35	2.00	0.53	5.00	1.80	0.00	1.80
28.40	2.00	0.53	5.00	1.80	0.00	1.80
28.45	2.00	0.53	5.00	1.80	0.00	1.80
28.50	2.00	0.53	5.00	1.80	0.00	1.80
28.55	2.00	0.53	5.00	1.80	0.00	1.80
28.60	2.00	0.53	5.00	1.80	0.00	1.80
28.65	2.00	0.53	5.00	1.80	0.00	1.80
28.70	2.00	0.53	5.00	1.80	0.00	1.80
28.75	2.00	0.53	5.00	1.80	0.00	1.80
28.80	2.00	0.53	5.00	1.80	0.00	1.80
28.85	2.00	0.53	5.00	1.80	0.00	1.80
28.90	2.00	0.53	5.00	1.80	0.00	1.80
28.95	2.00	0.53	5.00	1.80	0.00	1.80
29.00	2.00	0.53	5.00	1.80	0.00	1.80
29.05	2.00	0.53	5.00	1.80	0.00	1.80
29.10	2.00	0.53	5.00	1.80	0.00	1.80
29.15	2.00	0.53	5.00	1.80	0.00	1.80
29.20	2.00	0.53	5.00	1.80	0.00	1.80
29.25	2.00	0.53	5.00	1.80	0.00	1.80
29.30	2.00	0.53	5.00	1.80	0.00	1.80
29.35	2.00	0.53	5.00	1.80	0.00	1.80
29.40	2.00	0.53	5.00	1.80	0.00	1.80
29.45	2.00	0.53	5.00	1.80	0.00	1.80
29.50	2.00	0.53	5.00	1.80	0.00	1.80
29.55	2.00	0.53	5.00	1.80	0.00	1.80
29.60	2.00	0.53	5.00	1.80	0.00	1.80
29.65	2.00	0.53	5.00	1.80	0.00	1.80
29.70	2.00	0.53	5.00	1.80	0.00	1.80
29.75	2.00	0.54	5.00	1.80	0.00	1.80
29.80	2.00	0.54	5.00	1.80	0.00	1.80
29.85	2.00	0.54	5.00	1.80	0.00	1.80
29.90	2.00	0.54	5.00	1.80	0.00	1.80
29.95	2.00	0.54	5.00	1.80	0.00	1.80
30.00	2.00	0.54	5.00	1.80	0.00	1.80
30.05	2.00	0.54	5.00	1.80	0.00	1.80

30.10	2.00	0.54	5.00	1.80	0.00	1.80
30.15	2.00	0.54	5.00	1.80	0.00	1.80
30.20	2.00	0.54	5.00	1.80	0.00	1.80
30.25	2.00	0.54	5.00	1.80	0.00	1.80
30.30	2.00	0.54	5.00	1.80	0.00	1.80
30.35	2.00	0.54	5.00	1.80	0.00	1.80
30.40	2.00	0.54	5.00	1.80	0.00	1.80
30.45	2.00	0.54	5.00	1.80	0.00	1.80
30.50	2.00	0.54	5.00	1.80	0.00	1.80
30.55	2.00	0.54	5.00	1.80	0.00	1.80
30.60	2.00	0.54	5.00	1.80	0.00	1.80
30.65	2.00	0.54	5.00	1.80	0.00	1.80
30.70	2.00	0.54	5.00	1.80	0.00	1.80
30.75	2.00	0.54	5.00	1.80	0.00	1.80
30.80	2.00	0.54	5.00	1.80	0.00	1.80
30.85	2.00	0.54	5.00	1.80	0.00	1.80
30.90	2.00	0.54	5.00	1.80	0.00	1.80
30.95	2.00	0.54	5.00	1.80	0.00	1.80
31.00	2.00	0.54	5.00	1.80	0.00	1.80
31.05	2.00	0.54	5.00	1.80	0.00	1.80
31.10	2.00	0.54	5.00	1.80	0.00	1.80
31.15	2.00	0.54	5.00	1.80	0.00	1.80
31.20	2.00	0.54	5.00	1.80	0.00	1.80
31.25	2.00	0.54	5.00	1.80	0.00	1.80
31.30	2.00	0.53	5.00	1.80	0.00	1.80
31.35	2.00	0.53	5.00	1.80	0.00	1.80
31.40	2.00	0.53	5.00	1.80	0.00	1.80
31.45	2.00	0.53	5.00	1.80	0.00	1.80
31.50	2.00	0.53	5.00	1.80	0.00	1.80
31.55	2.00	0.53	5.00	1.80	0.00	1.80
31.60	2.00	0.53	5.00	1.80	0.00	1.80
31.65	2.00	0.53	5.00	1.80	0.00	1.80
31.70	2.00	0.53	5.00	1.80	0.00	1.80
31.75	2.00	0.53	5.00	1.80	0.00	1.80
31.80	2.00	0.53	5.00	1.80	0.00	1.80
31.85	2.00	0.53	5.00	1.80	0.00	1.80
31.90	2.00	0.53	5.00	1.80	0.00	1.80
31.95	2.00	0.53	5.00	1.80	0.00	1.80
32.00	2.00	0.53	5.00	1.80	0.00	1.80
32.05	0.13	0.53	0.25*	1.80	0.00	1.80
32.10	0.13	0.53	0.25*	1.78	0.00	1.78
32.15	0.13	0.53	0.25*	1.76	0.00	1.76
32.20	0.13	0.53	0.25*	1.74	0.00	1.74
32.25	0.13	0.53	0.25*	1.72	0.00	1.72
32.30	0.13	0.53	0.25*	1.70	0.00	1.70
32.35	0.13	0.53	0.25*	1.68	0.00	1.68
32.40	0.13	0.53	0.25*	1.66	0.00	1.66
32.45	0.13	0.53	0.25*	1.64	0.00	1.64
32.50	0.13	0.53	0.25*	1.62	0.00	1.62
32.55	0.13	0.53	0.25*	1.60	0.00	1.60
32.60	0.13	0.53	0.25*	1.58	0.00	1.58
32.65	0.13	0.53	0.25*	1.56	0.00	1.56
32.70	0.13	0.53	0.25*	1.54	0.00	1.54
32.75	0.13	0.53	0.25*	1.52	0.00	1.52
32.80	0.13	0.53	0.25*	1.50	0.00	1.50
32.85	0.13	0.53	0.25*	1.48	0.00	1.48
32.90	0.13	0.53	0.25*	1.46	0.00	1.46
32.95	0.13	0.53	0.25*	1.44	0.00	1.44
33.00	0.13	0.53	0.25*	1.42	0.00	1.42
33.05	0.13	0.53	0.25*	1.40	0.00	1.40
33.10	0.13	0.53	0.25*	1.38	0.00	1.38
33.15	0.13	0.53	0.25*	1.35	0.00	1.35
33.20	0.13	0.53	0.25*	1.33	0.00	1.33
33.25	0.13	0.53	0.25*	1.31	0.00	1.31
33.30	0.13	0.53	0.25*	1.29	0.00	1.29
33.35	0.13	0.53	0.25*	1.27	0.00	1.27
33.40	0.13	0.53	0.25*	1.25	0.00	1.25
33.45	0.13	0.53	0.25*	1.23	0.00	1.23
33.50	0.13	0.53	0.25*	1.21	0.00	1.21
33.55	0.13	0.53	0.25*	1.19	0.00	1.19
33.60	0.13	0.53	0.25*	1.17	0.00	1.17
33.65	0.13	0.53	0.25*	1.15	0.00	1.15
33.70	0.13	0.53	0.25*	1.13	0.00	1.13
33.75	0.13	0.53	0.25*	1.11	0.00	1.11
33.80	0.13	0.53	0.25*	1.09	0.00	1.09
33.85	0.13	0.53	0.25*	1.07	0.00	1.07
33.90	0.13	0.53	0.25*	1.05	0.00	1.05
33.95	0.13	0.53	0.25*	1.03	0.00	1.03
34.00	0.13	0.53	0.25*	1.01	0.00	1.01
34.05	0.13	0.53	0.25*	0.99	0.00	0.99
34.10	0.14	0.53	0.26*	0.97	0.00	0.97
34.15	0.14	0.53	0.26*	0.95	0.00	0.95
34.20	0.14	0.53	0.27*	0.93	0.00	0.93
34.25	0.15	0.53	0.27*	0.91	0.00	0.91
34.30	0.15	0.53	0.28*	0.89	0.00	0.89
34.35	0.15	0.53	0.29*	0.87	0.00	0.87
34.40	0.16	0.53	0.29*	0.85	0.00	0.85
34.45	0.16	0.53	0.30*	0.83	0.00	0.83
34.50	0.16	0.53	0.30*	0.82	0.00	0.82
34.55	0.17	0.53	0.31*	0.80	0.00	0.80
34.60	0.17	0.53	0.32*	0.78	0.00	0.78
34.65	0.17	0.53	0.32*	0.76	0.00	0.76
34.70	0.17	0.53	0.33*	0.74	0.00	0.74
34.75	0.18	0.53	0.33*	0.73	0.00	0.73
34.80	0.18	0.53	0.34*	0.71	0.00	0.71
34.85	0.18	0.53	0.35*	0.69	0.00	0.69
34.90	0.19	0.53	0.35*	0.68	0.00	0.68
34.95	0.19	0.53	0.36*	0.66	0.00	0.66
35.00	0.19	0.53	0.36*	0.64	0.00	0.64
35.05	0.20	0.53	0.37*	0.63	0.00	0.63
35.10	0.20	0.53	0.38*	0.61	0.00	0.61
35.15	0.20	0.53	0.38*	0.60	0.00	0.60
35.20	0.21	0.53	0.39*	0.58	0.00	0.58
35.25	0.21	0.53	0.39*	0.57	0.00	0.57
35.30	0.21	0.53	0.40*	0.55	0.00	0.55
35.35	0.21	0.53	0.41*	0.54	0.00	0.54
35.40	0.22	0.53	0.41*	0.52	0.00	0.52
35.45	0.22	0.53	0.42*	0.51	0.00	0.51
35.50	0.22	0.53	0.42*	0.49	0.00	0.49
35.55	0.23	0.53	0.43*	0.48	0.00	0.48
35.60	0.23	0.53	0.43*	0.46	0.00	0.46
35.65	0.23	0.53	0.44*	0.45	0.00	0.45
35.70	0.24	0.53	0.45*	0.44	0.00	0.44
35.75	0.24	0.53	0.45*	0.42	0.00	0.42
35.80	0.24	0.53	0.46*	0.41	0.00	0.41
35.85	0.25	0.53	0.47*	0.40	0.00	0.40
35.90	0.25	0.53	0.47*	0.38	0.00	0.38
35.95	0.25	0.53	0.48*	0.37	0.00	0.37
36.00	0.26	0.53	0.48*	0.36	0.00	0.36
36.05	0.26	0.53	0.49*	0.34	0.00	0.34
36.10	0.26	0.53	0.50*	0.33	0.00	0.33
36.15	0.27	0.53	0.50*	0.32	0.00	0.32
36.20	0.27	0.53	0.51*	0.31	0.00	0.31
36.25	0.27	0.53	0.52*	0.29	0.00	0.29
36.30	0.28	0.53	0.52*	0.28	0.00	0.28
36.35	0.28	0.53	0.53*	0.27	0.00	0.27
36.40	0.28	0.53	0.54*	0.26	0.00	0.26
36.45	0.29	0.53	0.54*	0.25	0.00	0.25
36.50	0.29	0.53	0.55*	0.24	0.00	0.24
36.55	0.30	0.53	0.56*	0.22	0.00	0.22
36.60	0.30	0.53	0.57*	0.21	0.00	0.21
36.65	0.30	0.53	0.57*	0.20	0.00	0.20
36.70	0.31	0.53	0.58*	0.19	0.00	0.19
36.75	0.31	0.53	0.59*	0.18	0.00	0.18
36.80	0.32	0.53	0.60*	0.17	0.00	0.17
36.85	0.32	0.53	0.61*	0.16	0.00	0.16
36.90	0.32	0.53	0.62*	0.15	0.00	0.15
36.95	0.33	0.53	0.62*	0.14	0.00	0.14

37.00	0.33	0.53	0.63*	0.13	0.00	0.13
37.05	0.34	0.53	0.64*	0.12	0.00	0.12
37.10	0.34	0.53	0.65*	0.11	0.00	0.11
37.15	0.35	0.53	0.66*	0.10	0.00	0.10
37.20	0.35	0.53	0.67*	0.09	0.00	0.09
37.25	0.36	0.53	0.68*	0.09	0.00	0.09
37.30	0.36	0.53	0.69*	0.08	0.00	0.08
37.35	0.37	0.53	0.71*	0.07	0.00	0.07
37.40	0.38	0.52	0.72*	0.06	0.00	0.06
37.45	0.38	0.52	0.73*	0.06	0.00	0.06
37.50	0.39	0.52	0.74*	0.05	0.00	0.05
37.55	0.40	0.52	0.76*	0.04	0.00	0.04
37.60	0.40	0.52	0.77*	0.04	0.00	0.04
37.65	0.41	0.52	0.79*	0.03	0.00	0.03
37.70	0.42	0.52	0.81*	0.02	0.00	0.02
37.75	0.43	0.52	0.83*	0.02	0.00	0.02
37.80	0.45	0.52	0.85*	0.01	0.00	0.01
37.85	0.46	0.52	0.88*	0.01	0.00	0.01
37.90	0.49	0.52	0.93*	0.01	0.00	0.01
37.95	0.53	0.52	1.01	0.00	0.00	0.00
38.00	2.30	0.52	4.40	0.00	0.00	0.00
38.05	2.30	0.52	4.40	0.00	0.00	0.00
38.10	2.30	0.52	4.40	0.00	0.00	0.00
38.15	2.30	0.52	4.40	0.00	0.00	0.00
38.20	2.30	0.52	4.40	0.00	0.00	0.00
38.25	2.30	0.52	4.40	0.00	0.00	0.00
38.30	2.30	0.52	4.41	0.00	0.00	0.00
38.35	2.30	0.52	4.41	0.00	0.00	0.00
38.40	2.30	0.52	4.41	0.00	0.00	0.00
38.45	2.30	0.52	4.41	0.00	0.00	0.00
38.50	2.30	0.52	4.41	0.00	0.00	0.00
38.55	2.30	0.52	4.41	0.00	0.00	0.00
38.60	2.30	0.52	4.41	0.00	0.00	0.00
38.65	2.30	0.52	4.41	0.00	0.00	0.00
38.70	2.30	0.52	4.42	0.00	0.00	0.00
38.75	2.30	0.52	4.42	0.00	0.00	0.00
38.80	2.30	0.52	4.42	0.00	0.00	0.00
38.85	2.30	0.52	4.42	0.00	0.00	0.00
38.90	2.30	0.52	4.42	0.00	0.00	0.00
38.95	2.30	0.52	4.42	0.00	0.00	0.00
39.00	2.30	0.52	4.42	0.00	0.00	0.00
39.05	2.30	0.52	4.43	0.00	0.00	0.00
39.10	2.30	0.52	4.43	0.00	0.00	0.00
39.15	2.30	0.52	4.43	0.00	0.00	0.00
39.20	2.30	0.52	4.43	0.00	0.00	0.00
39.25	2.30	0.52	4.43	0.00	0.00	0.00
39.30	2.30	0.52	4.43	0.00	0.00	0.00
39.35	2.30	0.52	4.43	0.00	0.00	0.00
39.40	2.30	0.52	4.44	0.00	0.00	0.00
39.45	2.30	0.52	4.44	0.00	0.00	0.00
39.50	2.30	0.52	4.44	0.00	0.00	0.00
39.55	2.30	0.52	4.44	0.00	0.00	0.00
39.60	2.30	0.52	4.44	0.00	0.00	0.00
39.65	2.30	0.52	4.44	0.00	0.00	0.00
39.70	2.30	0.52	4.45	0.00	0.00	0.00
39.75	2.30	0.52	4.45	0.00	0.00	0.00
39.80	2.30	0.52	4.45	0.00	0.00	0.00
39.85	2.30	0.52	4.45	0.00	0.00	0.00
39.90	2.30	0.52	4.45	0.00	0.00	0.00
39.95	2.30	0.52	4.45	0.00	0.00	0.00
40.00	2.30	0.52	4.45	0.00	0.00	0.00
40.05	2.30	0.52	4.46	0.00	0.00	0.00
40.10	2.30	0.52	4.46	0.00	0.00	0.00
40.15	2.30	0.52	4.46	0.00	0.00	0.00
40.20	2.30	0.52	4.46	0.00	0.00	0.00
40.25	2.30	0.52	4.46	0.00	0.00	0.00
40.30	2.30	0.52	4.46	0.00	0.00	0.00
40.35	2.30	0.52	4.46	0.00	0.00	0.00
40.40	2.30	0.52	4.47	0.00	0.00	0.00
40.45	2.30	0.51	4.47	0.00	0.00	0.00
40.50	2.30	0.51	4.47	0.00	0.00	0.00
40.55	2.30	0.51	4.47	0.00	0.00	0.00
40.60	2.30	0.51	4.47	0.00	0.00	0.00
40.65	2.30	0.51	4.47	0.00	0.00	0.00
40.70	2.30	0.51	4.48	0.00	0.00	0.00
40.75	2.30	0.51	4.48	0.00	0.00	0.00
40.80	2.30	0.51	4.48	0.00	0.00	0.00
40.85	2.30	0.51	4.48	0.00	0.00	0.00
40.90	2.30	0.51	4.48	0.00	0.00	0.00
40.95	2.30	0.51	4.48	0.00	0.00	0.00
41.00	2.30	0.51	4.49	0.00	0.00	0.00
41.05	2.30	0.51	4.49	0.00	0.00	0.00
41.10	2.30	0.51	4.49	0.00	0.00	0.00
41.15	2.30	0.51	4.49	0.00	0.00	0.00
41.20	2.30	0.51	4.49	0.00	0.00	0.00
41.25	2.30	0.51	4.49	0.00	0.00	0.00
41.30	2.30	0.51	4.49	0.00	0.00	0.00
41.35	2.30	0.51	4.50	0.00	0.00	0.00
41.40	2.30	0.51	4.50	0.00	0.00	0.00
41.45	2.30	0.51	4.50	0.00	0.00	0.00
41.50	2.30	0.51	4.50	0.00	0.00	0.00
41.55	2.30	0.51	4.50	0.00	0.00	0.00
41.60	2.30	0.51	4.50	0.00	0.00	0.00
41.65	2.30	0.51	4.51	0.00	0.00	0.00
41.70	2.30	0.51	4.51	0.00	0.00	0.00
41.75	2.30	0.51	4.51	0.00	0.00	0.00
41.80	2.30	0.51	4.51	0.00	0.00	0.00
41.85	2.30	0.51	4.51	0.00	0.00	0.00
41.90	2.30	0.51	4.51	0.00	0.00	0.00
41.95	2.30	0.51	4.52	0.00	0.00	0.00
42.00	2.30	0.51	4.52	0.00	0.00	0.00
42.05	2.30	0.51	4.52	0.00	0.00	0.00
42.10	2.30	0.51	4.52	0.00	0.00	0.00
42.15	2.30	0.51	4.52	0.00	0.00	0.00
42.20	2.30	0.51	4.52	0.00	0.00	0.00
42.25	2.30	0.51	4.53	0.00	0.00	0.00
42.30	2.30	0.51	4.53	0.00	0.00	0.00
42.35	2.30	0.51	4.53	0.00	0.00	0.00
42.40	2.30	0.51	4.53	0.00	0.00	0.00
42.45	2.30	0.51	4.53	0.00	0.00	0.00
42.50	2.30	0.51	4.53	0.00	0.00	0.00
42.55	2.30	0.51	4.54	0.00	0.00	0.00
42.60	2.30	0.51	4.54	0.00	0.00	0.00
42.65	2.30	0.51	4.54	0.00	0.00	0.00
42.70	2.30	0.51	4.54	0.00	0.00	0.00
42.75	2.30	0.51	4.54	0.00	0.00	0.00
42.80	2.30	0.51	4.54	0.00	0.00	0.00
42.85	2.30	0.51	4.55	0.00	0.00	0.00
42.90	2.30	0.51	4.55	0.00	0.00	0.00
42.95	2.30	0.51	4.55	0.00	0.00	0.00
43.00	2.30	0.51	4.55	0.00	0.00	0.00
43.05	2.30	0.51	4.55	0.00	0.00	0.00
43.10	2.30	0.51	4.55	0.00	0.00	0.00
43.15	2.30	0.50	4.56	0.00	0.00	0.00
43.20	2.30	0.50	4.56	0.00	0.00	0.00
43.25	2.30	0.50	4.56	0.00	0.00	0.00
43.30	2.30	0.50	4.56	0.00	0.00	0.00
43.35	2.30	0.50	4.56	0.00	0.00	0.00
43.40	2.30	0.50	4.56	0.00	0.00	0.00
43.45	2.30	0.50	4.57	0.00	0.00	0.00
43.50	2.30	0.50	4.57	0.00	0.00	0.00
43.55	2.30	0.50	4.57	0.00	0.00	0.00
43.60	2.30	0.50	4.57	0.00	0.00	0.00
43.65	2.30	0.50	4.57	0.00	0.00	0.00
43.70	2.30	0.50	4.57	0.00	0.00	0.00
43.75	2.30	0.50	4.58	0.00	0.00	0.00
43.80	2.30	0.50	4.58	0.00	0.00	0.00
43.85	2.30	0.50	4.58	0.00	0.00	0.00

43.90	2.30	0.50	4.58	0.00	0.00	0.00
43.95	2.30	0.50	4.58	0.00	0.00	0.00
44.00	2.30	0.50	4.58	0.00	0.00	0.00
44.05	2.30	0.50	4.59	0.00	0.00	0.00
44.10	2.30	0.50	4.59	0.00	0.00	0.00
44.15	2.30	0.50	4.59	0.00	0.00	0.00
44.20	2.30	0.50	4.59	0.00	0.00	0.00
44.25	2.30	0.50	4.59	0.00	0.00	0.00
44.30	2.30	0.50	4.60	0.00	0.00	0.00
44.35	2.30	0.50	4.60	0.00	0.00	0.00
44.40	2.30	0.50	4.60	0.00	0.00	0.00
44.45	2.30	0.50	4.60	0.00	0.00	0.00
44.50	2.30	0.50	4.60	0.00	0.00	0.00
44.55	2.30	0.50	4.60	0.00	0.00	0.00
44.60	2.30	0.50	4.61	0.00	0.00	0.00
44.65	2.30	0.50	4.61	0.00	0.00	0.00
44.70	2.30	0.50	4.61	0.00	0.00	0.00
44.75	2.30	0.50	4.61	0.00	0.00	0.00
44.80	2.30	0.50	4.61	0.00	0.00	0.00
44.85	2.30	0.50	4.62	0.00	0.00	0.00
44.90	2.30	0.50	4.62	0.00	0.00	0.00
44.95	2.30	0.50	4.62	0.00	0.00	0.00
45.00	2.30	0.50	4.62	0.00	0.00	0.00
45.05	2.30	0.50	4.62	0.00	0.00	0.00
45.10	2.30	0.50	4.62	0.00	0.00	0.00
45.15	2.30	0.50	4.63	0.00	0.00	0.00
45.20	2.30	0.50	4.63	0.00	0.00	0.00
45.25	2.30	0.50	4.63	0.00	0.00	0.00
45.30	2.30	0.50	4.63	0.00	0.00	0.00
45.35	2.30	0.50	4.63	0.00	0.00	0.00
45.40	2.30	0.50	4.64	0.00	0.00	0.00
45.45	2.30	0.50	4.64	0.00	0.00	0.00
45.50	2.30	0.50	4.64	0.00	0.00	0.00
45.55	2.30	0.50	4.64	0.00	0.00	0.00
45.60	2.30	0.50	4.64	0.00	0.00	0.00
45.65	2.30	0.50	4.64	0.00	0.00	0.00
45.70	2.30	0.50	4.65	0.00	0.00	0.00
45.75	2.30	0.49	4.65	0.00	0.00	0.00
45.80	2.30	0.49	4.65	0.00	0.00	0.00
45.85	2.30	0.49	4.65	0.00	0.00	0.00
45.90	2.30	0.49	4.65	0.00	0.00	0.00
45.95	2.30	0.49	4.66	0.00	0.00	0.00
46.00	2.30	0.49	4.66	0.00	0.00	0.00
46.05	2.30	0.49	4.66	0.00	0.00	0.00
46.10	2.30	0.49	4.66	0.00	0.00	0.00
46.15	2.30	0.49	4.66	0.00	0.00	0.00
46.20	2.30	0.49	4.67	0.00	0.00	0.00
46.25	2.30	0.49	4.67	0.00	0.00	0.00
46.30	2.30	0.49	4.67	0.00	0.00	0.00
46.35	2.30	0.49	4.67	0.00	0.00	0.00
46.40	2.30	0.49	4.67	0.00	0.00	0.00
46.45	2.30	0.49	4.67	0.00	0.00	0.00
46.50	2.30	0.49	4.68	0.00	0.00	0.00
46.55	2.30	0.49	4.68	0.00	0.00	0.00
46.60	2.30	0.49	4.68	0.00	0.00	0.00
46.65	2.30	0.49	4.68	0.00	0.00	0.00
46.70	2.30	0.49	4.68	0.00	0.00	0.00
46.75	2.30	0.49	4.69	0.00	0.00	0.00
46.80	2.30	0.49	4.69	0.00	0.00	0.00
46.85	2.30	0.49	4.69	0.00	0.00	0.00
46.90	2.30	0.49	4.69	0.00	0.00	0.00
46.95	2.30	0.49	4.69	0.00	0.00	0.00
47.00	2.30	0.49	4.70	0.00	0.00	0.00
47.05	2.30	0.49	4.70	0.00	0.00	0.00
47.10	2.30	0.49	4.70	0.00	0.00	0.00
47.15	2.30	0.49	4.70	0.00	0.00	0.00
47.20	2.30	0.49	4.70	0.00	0.00	0.00
47.25	2.31	0.49	4.73	0.00	0.00	0.00
47.30	2.31	0.49	4.74	0.00	0.00	0.00
47.35	2.31	0.49	4.74	0.00	0.00	0.00
47.40	2.31	0.49	4.74	0.00	0.00	0.00
47.45	2.31	0.49	4.74	0.00	0.00	0.00
47.50	2.31	0.49	4.74	0.00	0.00	0.00
47.55	2.31	0.49	4.74	0.00	0.00	0.00
47.60	2.31	0.49	4.74	0.00	0.00	0.00
47.65	2.31	0.49	4.74	0.00	0.00	0.00
47.70	2.31	0.49	4.75	0.00	0.00	0.00
47.75	2.31	0.49	4.75	0.00	0.00	0.00
47.80	2.31	0.49	4.75	0.00	0.00	0.00
47.85	2.31	0.49	4.75	0.00	0.00	0.00
47.90	2.31	0.49	4.75	0.00	0.00	0.00
47.95	2.31	0.49	4.75	0.00	0.00	0.00
48.00	2.31	0.49	4.75	0.00	0.00	0.00
48.05	2.31	0.49	4.75	0.00	0.00	0.00
48.10	2.31	0.49	4.76	0.00	0.00	0.00
48.15	2.31	0.49	4.76	0.00	0.00	0.00
48.20	2.31	0.48	4.76	0.00	0.00	0.00
48.25	2.31	0.48	4.76	0.00	0.00	0.00
48.30	2.31	0.48	4.76	0.00	0.00	0.00
48.35	2.31	0.48	4.76	0.00	0.00	0.00
48.40	2.31	0.48	4.76	0.00	0.00	0.00
48.45	2.31	0.48	4.77	0.00	0.00	0.00
48.50	2.31	0.48	4.77	0.00	0.00	0.00
48.55	2.31	0.48	4.77	0.00	0.00	0.00
48.60	2.31	0.48	4.77	0.00	0.00	0.00
48.65	2.30	0.48	4.77	0.00	0.00	0.00
48.70	2.30	0.48	4.77	0.00	0.00	0.00
48.75	2.30	0.48	4.77	0.00	0.00	0.00
48.80	2.30	0.48	4.77	0.00	0.00	0.00
48.85	2.30	0.48	4.78	0.00	0.00	0.00
48.90	2.30	0.48	4.78	0.00	0.00	0.00
48.95	2.30	0.48	4.78	0.00	0.00	0.00
49.00	2.30	0.48	4.78	0.00	0.00	0.00
49.05	2.30	0.48	4.78	0.00	0.00	0.00
49.10	2.30	0.48	4.78	0.00	0.00	0.00
49.15	2.30	0.48	4.78	0.00	0.00	0.00
49.20	2.30	0.48	4.79	0.00	0.00	0.00
49.25	2.30	0.48	4.79	0.00	0.00	0.00
49.30	2.30	0.48	4.79	0.00	0.00	0.00
49.35	2.30	0.48	4.79	0.00	0.00	0.00
49.40	2.30	0.48	4.79	0.00	0.00	0.00
49.45	2.30	0.48	4.79	0.00	0.00	0.00
49.50	2.30	0.48	4.79	0.00	0.00	0.00
49.55	2.30	0.48	4.80	0.00	0.00	0.00
49.60	2.30	0.48	4.80	0.00	0.00	0.00
49.65	2.30	0.48	4.80	0.00	0.00	0.00
49.70	2.30	0.48	4.80	0.00	0.00	0.00
49.75	2.30	0.48	4.80	0.00	0.00	0.00
49.80	2.30	0.48	4.80	0.00	0.00	0.00
49.85	2.30	0.48	4.80	0.00	0.00	0.00
49.90	2.30	0.48	4.80	0.00	0.00	0.00
49.95	2.30	0.48	4.81	0.00	0.00	0.00
50.00	2.30	0.48	4.81	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Depth = ft, Stress or Pressure = tsf (atm), Unit Weight = pcf, Settlement = in.

CRRm	Cyclic resistance ratio from soils
CSRfs	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRfs
S_sat	Settlement from saturated sands
S_dry	Settlement from dry sands
S_all	Total settlement from saturated and dry sands
NoLiq	No-Liquefy Soils

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Input File Name: E:\VB&B\Woodfin\Boring 2.liq
Title: Woodfin Suites
Subtitle: B-2

Surface Elev.=11
Hole No.=B-2
Depth of Hole= 75.0 ft
Water Table during Earthquake= 6.0 ft
Water Table during In-Situ Testing= 11.0 ft
Max. Acceleration= 0.5 g
Earthquake Magnitude= 7.1

Input Data:

Surface Elev.=11
Hole No.=B-2
Depth of Hole=75.0 ft
Water Table during Earthquake= 6.0 ft
Water Table during In-Situ Testing= 11.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=7.1

Earthquake Magnitude=7.1
2. Settlement Analysis Method: Ishihara / Yoshimine*
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1
7. Borehole Diameter, Cb= 1.15
8. Sampeling Method, Cs= 1
9. User request factor of safty (apply to CSR) , User= 1.2
Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.0	15.0	100.0	NoLiq
3.0	15.0	100.0	NoLiq
6.0	11.0	100.0	NoLiq
7.0	10.0	100.0	NoLiq
9.0	10.0	100.0	NoLiq
10.0	10.0	100.0	NoLiq
12.0	10.0	100.0	NoLiq
14.0	10.0	100.0	NoLiq
15.0	10.0	110.0	16.0
17.0	8.0	110.0	16.0
18.0	8.0	110.0	16.0
19.0	25.0	110.0	5.0
21.0	17.0	110.0	9.0
23.0	20.0	110.0	9.0
25.0	14.0	110.0	9.0
27.0	14.0	110.0	NoLiq
31.0	14.0	110.0	NoLiq
34.0	6.0	110.0	48.0
36.0	6.0	110.0	48.0
41.0	7.0	110.0	45.0
43.0	38.0	120.0	10.0
46.0	38.0	120.0	10.0
51.0	63.0	120.0	10.0
56.0	42.0	120.0	10.0
61.0	38.0	120.0	10.0
65.0	32.0	110.0	16.0
68.0	27.0	110.0	16.0
71.0	27.0	110.0	10.0
74.0	63.0	110.0	45.0

Output Results:

Settlement of saturated sands=6.71 in.
Settlement of dry sands=0.00 in.
Total settlement of saturated and dry sands=6.71 in.
Differential Settlement=3.355 to 4.428 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.00	0.32	5.00	6.71	0.00	6.71
0.05	2.00	0.32	5.00	6.71	0.00	6.71
0.10	2.00	0.32	5.00	6.71	0.00	6.71
0.15	2.00	0.32	5.00	6.71	0.00	6.71
0.20	2.00	0.32	5.00	6.71	0.00	6.71
0.25	2.00	0.32	5.00	6.71	0.00	6.71
0.30	2.00	0.32	5.00	6.71	0.00	6.71
0.35	2.00	0.32	5.00	6.71	0.00	6.71
0.40	2.00	0.32	5.00	6.71	0.00	6.71
0.45	2.00	0.32	5.00	6.71	0.00	6.71
0.50	2.00	0.32	5.00	6.71	0.00	6.71
0.55	2.00	0.32	5.00	6.71	0.00	6.71
0.60	2.00	0.32	5.00	6.71	0.00	6.71
0.65	2.00	0.32	5.00	6.71	0.00	6.71
0.70	2.00	0.32	5.00	6.71	0.00	6.71
0.75	2.00	0.32	5.00	6.71	0.00	6.71
0.80	2.00	0.32	5.00	6.71	0.00	6.71
0.85	2.00	0.32	5.00	6.71	0.00	6.71
0.90	2.00	0.32	5.00	6.71	0.00	6.71
0.95	2.00	0.32	5.00	6.71	0.00	6.71
1.00	2.00	0.32	5.00	6.71	0.00	6.71
1.05	2.00	0.32	5.00	6.71	0.00	6.71
1.10	2.00	0.32	5.00	6.71	0.00	6.71
1.15	2.00	0.32	5.00	6.71	0.00	6.71
1.20	2.00	0.32	5.00	6.71	0.00	6.71
1.25	2.00	0.32	5.00	6.71	0.00	6.71
1.30	2.00	0.32	5.00	6.71	0.00	6.71
1.35	2.00	0.32	5.00	6.71	0.00	6.71
1.40	2.00	0.32	5.00	6.71	0.00	6.71
1.45	2.00	0.32	5.00	6.71	0.00	6.71
1.50	2.00	0.32	5.00	6.71	0.00	6.71
1.55	2.00	0.32	5.00	6.71	0.00	6.71
1.60	2.00	0.32	5.00	6.71	0.00	6.71
1.65	2.00	0.32	5.00	6.71	0.00	6.71
1.70	2.00	0.32	5.00	6.71	0.00	6.71
1.75	2.00	0.32	5.00	6.71	0.00	6.71
1.80	2.00	0.32	5.00	6.71	0.00	6.71
1.85	2.00	0.32	5.00	6.71	0.00	6.71
1.90	2.00	0.32	5.00	6.71	0.00	6.71
1.95	2.00	0.32	5.00	6.71	0.00	6.71
2.00	2.00	0.32	5.00	6.71	0.00	6.71
2.05	2.00	0.32	5.00	6.71	0.00	6.71
2.10	2.00	0.32	5.00	6.71	0.00	6.71
2.15	2.00	0.32	5.00	6.71	0.00	6.71
2.20	2.00	0.32	5.00	6.71	0.00	6.71
2.25	2.00	0.32	5.00	6.71	0.00	6.71

2.30	2.00	0.32	5.00	6.71	0.00	6.71
2.35	2.00	0.32	5.00	6.71	0.00	6.71
2.40	2.00	0.32	5.00	6.71	0.00	6.71
2.45	2.00	0.32	5.00	6.71	0.00	6.71
2.50	2.00	0.32	5.00	6.71	0.00	6.71
2.55	2.00	0.32	5.00	6.71	0.00	6.71
2.60	2.00	0.32	5.00	6.71	0.00	6.71
2.65	2.00	0.32	5.00	6.71	0.00	6.71
2.70	2.00	0.32	5.00	6.71	0.00	6.71
2.75	2.00	0.32	5.00	6.71	0.00	6.71
2.80	2.00	0.32	5.00	6.71	0.00	6.71
2.85	2.00	0.32	5.00	6.71	0.00	6.71
2.90	2.00	0.32	5.00	6.71	0.00	6.71
2.95	2.00	0.32	5.00	6.71	0.00	6.71
3.00	2.00	0.32	5.00	6.71	0.00	6.71
3.05	2.00	0.32	5.00	6.71	0.00	6.71
3.10	2.00	0.32	5.00	6.71	0.00	6.71
3.15	2.00	0.32	5.00	6.71	0.00	6.71
3.20	2.00	0.32	5.00	6.71	0.00	6.71
3.25	2.00	0.32	5.00	6.71	0.00	6.71
3.30	2.00	0.32	5.00	6.71	0.00	6.71
3.35	2.00	0.32	5.00	6.71	0.00	6.71
3.40	2.00	0.32	5.00	6.71	0.00	6.71
3.45	2.00	0.32	5.00	6.71	0.00	6.71
3.50	2.00	0.32	5.00	6.71	0.00	6.71
3.55	2.00	0.32	5.00	6.71	0.00	6.71
3.60	2.00	0.32	5.00	6.71	0.00	6.71
3.65	2.00	0.32	5.00	6.71	0.00	6.71
3.70	2.00	0.32	5.00	6.71	0.00	6.71
3.75	2.00	0.32	5.00	6.71	0.00	6.71
3.80	2.00	0.32	5.00	6.71	0.00	6.71
3.85	2.00	0.32	5.00	6.71	0.00	6.71
3.90	2.00	0.32	5.00	6.71	0.00	6.71
3.95	2.00	0.32	5.00	6.71	0.00	6.71
4.00	2.00	0.32	5.00	6.71	0.00	6.71
4.05	2.00	0.32	5.00	6.71	0.00	6.71
4.10	2.00	0.32	5.00	6.71	0.00	6.71
4.15	2.00	0.32	5.00	6.71	0.00	6.71
4.20	2.00	0.32	5.00	6.71	0.00	6.71
4.25	2.00	0.32	5.00	6.71	0.00	6.71
4.30	2.00	0.32	5.00	6.71	0.00	6.71
4.35	2.00	0.32	5.00	6.71	0.00	6.71
4.40	2.00	0.32	5.00	6.71	0.00	6.71
4.45	2.00	0.32	5.00	6.71	0.00	6.71
4.50	2.00	0.32	5.00	6.71	0.00	6.71
4.55	2.00	0.32	5.00	6.71	0.00	6.71
4.60	2.00	0.32	5.00	6.71	0.00	6.71
4.65	2.00	0.32	5.00	6.71	0.00	6.71
4.70	2.00	0.32	5.00	6.71	0.00	6.71
4.75	2.00	0.32	5.00	6.71	0.00	6.71
4.80	2.00	0.32	5.00	6.71	0.00	6.71
4.85	2.00	0.32	5.00	6.71	0.00	6.71
4.90	2.00	0.32	5.00	6.71	0.00	6.71
4.95	2.00	0.32	5.00	6.71	0.00	6.71
5.00	2.00	0.32	5.00	6.71	0.00	6.71
5.05	2.00	0.32	5.00	6.71	0.00	6.71
5.10	2.00	0.32	5.00	6.71	0.00	6.71
5.15	2.00	0.32	5.00	6.71	0.00	6.71
5.20	2.00	0.32	5.00	6.71	0.00	6.71
5.25	2.00	0.32	5.00	6.71	0.00	6.71
5.30	2.00	0.32	5.00	6.71	0.00	6.71
5.35	2.00	0.32	5.00	6.71	0.00	6.71
5.40	2.00	0.32	5.00	6.71	0.00	6.71
5.45	2.00	0.32	5.00	6.71	0.00	6.71
5.50	2.00	0.32	5.00	6.71	0.00	6.71
5.55	2.00	0.32	5.00	6.71	0.00	6.71
5.60	2.00	0.32	5.00	6.71	0.00	6.71
5.65	2.00	0.32	5.00	6.71	0.00	6.71
5.70	2.00	0.32	5.00	6.71	0.00	6.71
5.75	2.00	0.32	5.00	6.71	0.00	6.71
5.80	2.00	0.32	5.00	6.71	0.00	6.71
5.85	2.00	0.32	5.00	6.71	0.00	6.71
5.90	2.00	0.32	5.00	6.71	0.00	6.71
5.95	2.00	0.32	5.00	6.71	0.00	6.71
6.00	2.00	0.32	5.00	6.71	0.00	6.71
6.05	2.00	0.32	5.00	6.71	0.00	6.71
6.10	2.00	0.32	5.00	6.71	0.00	6.71
6.15	2.00	0.33	5.00	6.71	0.00	6.71
6.20	2.00	0.33	5.00	6.71	0.00	6.71
6.25	2.00	0.33	5.00	6.71	0.00	6.71
6.30	2.00	0.33	5.00	6.71	0.00	6.71
6.35	2.00	0.33	5.00	6.71	0.00	6.71
6.40	2.00	0.33	5.00	6.71	0.00	6.71
6.45	2.00	0.33	5.00	6.71	0.00	6.71
6.50	2.00	0.34	5.00	6.71	0.00	6.71
6.55	2.00	0.34	5.00	6.71	0.00	6.71
6.60	2.00	0.34	5.00	6.71	0.00	6.71
6.65	2.00	0.34	5.00	6.71	0.00	6.71
6.70	2.00	0.34	5.00	6.71	0.00	6.71
6.75	2.00	0.34	5.00	6.71	0.00	6.71
6.80	2.00	0.35	5.00	6.71	0.00	6.71
6.85	2.00	0.35	5.00	6.71	0.00	6.71
6.90	2.00	0.35	5.00	6.71	0.00	6.71
6.95	2.00	0.35	5.00	6.71	0.00	6.71
7.00	2.00	0.35	5.00	6.71	0.00	6.71
7.05	2.00	0.35	5.00	6.71	0.00	6.71
7.10	2.00	0.35	5.00	6.71	0.00	6.71
7.15	2.00	0.36	5.00	6.71	0.00	6.71
7.20	2.00	0.36	5.00	6.71	0.00	6.71
7.25	2.00	0.36	5.00	6.71	0.00	6.71
7.30	2.00	0.36	5.00	6.71	0.00	6.71
7.35	2.00	0.36	5.00	6.71	0.00	6.71
7.40	2.00	0.36	5.00	6.71	0.00	6.71
7.45	2.00	0.36	5.00	6.71	0.00	6.71
7.50	2.00	0.36	5.00	6.71	0.00	6.71
7.55	2.00	0.37	5.00	6.71	0.00	6.71
7.60	2.00	0.37	5.00	6.71	0.00	6.71
7.65	2.00	0.37	5.00	6.71	0.00	6.71
7.70	2.00	0.37	5.00	6.71	0.00	6.71
7.75	2.00	0.37	5.00	6.71	0.00	6.71
7.80	2.00	0.37	5.00	6.71	0.00	6.71
7.85	2.00	0.37	5.00	6.71	0.00	6.71
7.90	2.00	0.38	5.00	6.71	0.00	6.71
7.95	2.00	0.38	5.00	6.71	0.00	6.71
8.00	2.00	0.38	5.00	6.71	0.00	6.71
8.05	2.00	0.38	5.00	6.71	0.00	6.71
8.10	2.00	0.38	5.00	6.71	0.00	6.71
8.15	2.00	0.38	5.00	6.71	0.00	6.71
8.20	2.00	0.38	5.00	6.71	0.00	6.71
8.25	2.00	0.38	5.00	6.71	0.00	6.71
8.30	2.00	0.39	5.00	6.71	0.00	6.71
8.35	2.00	0.39	5.00	6.71	0.00	6.71
8.40	2.00	0.39	5.00	6.71	0.00	6.71
8.45	2.00	0.39	5.00	6.71	0.00	6.71
8.50	2.00	0.39	5.00	6.71	0.00	6.71
8.55	2.00	0.39	5.00	6.71	0.00	6.71
8.60	2.00	0.39	5.00	6.71	0.00	6.71
8.65	2.00	0.39	5.00	6.71	0.00	6.71
8.70	2.00	0.39	5.00	6.71	0.00	6.71
8.75	2.00	0.40	5.00	6.71	0.00	6.71
8.80	2.00	0.40	5.00	6.71	0.00	6.71
8.85	2.00	0.40	5.00	6.71	0.00	6.71
8.90	2.00	0.40	5.00	6.71	0.00	6.71
8.95	2.00	0.40	5.00	6.71	0.00	6.71
9.00	2.00	0.40	5.00	6.71	0.00	6.71
9.05	2.00	0.40	5.00	6.71	0.00	6.71
9.10	2.00	0.40	5.00	6.71	0.00	6.71
9.15	2.00	0.41	5.00	6.71	0.00	6.71

9.20	2.00	0.41	5.00	6.71	0.00	6.71
9.25	2.00	0.41	5.00	6.71	0.00	6.71
9.30	2.00	0.41	5.00	6.71	0.00	6.71
9.35	2.00	0.41	5.00	6.71	0.00	6.71
9.40	2.00	0.41	5.00	6.71	0.00	6.71
9.45	2.00	0.41	5.00	6.71	0.00	6.71
9.50	2.00	0.41	5.00	6.71	0.00	6.71
9.55	2.00	0.41	5.00	6.71	0.00	6.71
9.60	2.00	0.41	5.00	6.71	0.00	6.71
9.65	2.00	0.42	5.00	6.71	0.00	6.71
9.70	2.00	0.42	5.00	6.71	0.00	6.71
9.75	2.00	0.42	5.00	6.71	0.00	6.71
9.80	2.00	0.42	5.00	6.71	0.00	6.71
9.85	2.00	0.42	5.00	6.71	0.00	6.71
9.90	2.00	0.42	5.00	6.71	0.00	6.71
9.95	2.00	0.42	5.00	6.71	0.00	6.71
10.00	2.00	0.42	5.00	6.71	0.00	6.71
10.05	2.00	0.42	5.00	6.71	0.00	6.71
10.10	2.00	0.43	5.00	6.71	0.00	6.71
10.15	2.00	0.43	5.00	6.71	0.00	6.71
10.20	2.00	0.43	5.00	6.71	0.00	6.71
10.25	2.00	0.43	5.00	6.71	0.00	6.71
10.30	2.00	0.43	5.00	6.71	0.00	6.71
10.35	2.00	0.43	5.00	6.71	0.00	6.71
10.40	2.00	0.43	5.00	6.71	0.00	6.71
10.45	2.00	0.43	5.00	6.71	0.00	6.71
10.50	2.00	0.43	5.00	6.71	0.00	6.71
10.55	2.00	0.43	5.00	6.71	0.00	6.71
10.60	2.00	0.43	5.00	6.71	0.00	6.71
10.65	2.00	0.44	5.00	6.71	0.00	6.71
10.70	2.00	0.44	5.00	6.71	0.00	6.71
10.75	2.00	0.44	5.00	6.71	0.00	6.71
10.80	2.00	0.44	5.00	6.71	0.00	6.71
10.85	2.00	0.44	5.00	6.71	0.00	6.71
10.90	2.00	0.44	5.00	6.71	0.00	6.71
10.95	2.00	0.44	5.00	6.71	0.00	6.71
11.00	2.00	0.44	5.00	6.71	0.00	6.71
11.05	2.00	0.44	5.00	6.71	0.00	6.71
11.10	2.00	0.44	5.00	6.71	0.00	6.71
11.15	2.00	0.44	5.00	6.71	0.00	6.71
11.20	2.00	0.45	5.00	6.71	0.00	6.71
11.25	2.00	0.45	5.00	6.71	0.00	6.71
11.30	2.00	0.45	5.00	6.71	0.00	6.71
11.35	2.00	0.45	5.00	6.71	0.00	6.71
11.40	2.00	0.45	5.00	6.71	0.00	6.71
11.45	2.00	0.45	5.00	6.71	0.00	6.71
11.50	2.00	0.45	5.00	6.71	0.00	6.71
11.55	2.00	0.45	5.00	6.71	0.00	6.71
11.60	2.00	0.45	5.00	6.71	0.00	6.71
11.65	2.00	0.45	5.00	6.71	0.00	6.71
11.70	2.00	0.45	5.00	6.71	0.00	6.71
11.75	2.00	0.46	5.00	6.71	0.00	6.71
11.80	2.00	0.46	5.00	6.71	0.00	6.71
11.85	2.00	0.46	5.00	6.71	0.00	6.71
11.90	2.00	0.46	5.00	6.71	0.00	6.71
11.95	2.00	0.46	5.00	6.71	0.00	6.71
12.00	2.00	0.46	5.00	6.71	0.00	6.71
12.05	2.00	0.46	5.00	6.71	0.00	6.71
12.10	2.00	0.46	5.00	6.71	0.00	6.71
12.15	2.00	0.46	5.00	6.71	0.00	6.71
12.20	2.00	0.46	5.00	6.71	0.00	6.71
12.25	2.00	0.46	5.00	6.71	0.00	6.71
12.30	2.00	0.46	5.00	6.71	0.00	6.71
12.35	2.00	0.46	5.00	6.71	0.00	6.71
12.40	2.00	0.47	5.00	6.71	0.00	6.71
12.45	2.00	0.47	5.00	6.71	0.00	6.71
12.50	2.00	0.47	5.00	6.71	0.00	6.71
12.55	2.00	0.47	5.00	6.71	0.00	6.71
12.60	2.00	0.47	5.00	6.71	0.00	6.71
12.65	2.00	0.47	5.00	6.71	0.00	6.71
12.70	2.00	0.47	5.00	6.71	0.00	6.71
12.75	2.00	0.47	5.00	6.71	0.00	6.71
12.80	2.00	0.47	5.00	6.71	0.00	6.71
12.85	2.00	0.47	5.00	6.71	0.00	6.71
12.90	2.00	0.47	5.00	6.71	0.00	6.71
12.95	2.00	0.47	5.00	6.71	0.00	6.71
13.00	2.00	0.47	5.00	6.71	0.00	6.71
13.05	2.00	0.48	5.00	6.71	0.00	6.71
13.10	2.00	0.48	5.00	6.71	0.00	6.71
13.15	2.00	0.48	5.00	6.71	0.00	6.71
13.20	2.00	0.48	5.00	6.71	0.00	6.71
13.25	2.00	0.48	5.00	6.71	0.00	6.71
13.30	2.00	0.48	5.00	6.71	0.00	6.71
13.35	2.00	0.48	5.00	6.71	0.00	6.71
13.40	2.00	0.48	5.00	6.71	0.00	6.71
13.45	2.00	0.48	5.00	6.71	0.00	6.71
13.50	2.00	0.48	5.00	6.71	0.00	6.71
13.55	2.00	0.48	5.00	6.71	0.00	6.71
13.60	2.00	0.48	5.00	6.71	0.00	6.71
13.65	2.00	0.48	5.00	6.71	0.00	6.71
13.70	2.00	0.48	5.00	6.71	0.00	6.71
13.75	2.00	0.49	5.00	6.71	0.00	6.71
13.80	2.00	0.49	5.00	6.71	0.00	6.71
13.85	2.00	0.49	5.00	6.71	0.00	6.71
13.90	2.00	0.49	5.00	6.71	0.00	6.71
13.95	2.00	0.49	5.00	6.71	0.00	6.71
14.00	2.00	0.49	5.00	6.71	0.00	6.71
14.05	2.00	0.49	5.00	6.71	0.00	6.71
14.10	2.00	0.49	5.00	6.71	0.00	6.71
14.15	2.00	0.49	5.00	6.71	0.00	6.71
14.20	2.00	0.49	5.00	6.71	0.00	6.71
14.25	2.00	0.49	5.00	6.71	0.00	6.71
14.30	2.00	0.49	5.00	6.71	0.00	6.71
14.35	2.00	0.49	5.00	6.71	0.00	6.71
14.40	2.00	0.49	5.00	6.71	0.00	6.71
14.45	2.00	0.49	5.00	6.71	0.00	6.71
14.50	2.00	0.49	5.00	6.71	0.00	6.71
14.55	2.00	0.50	5.00	6.71	0.00	6.71
14.60	2.00	0.50	5.00	6.71	0.00	6.71
14.65	2.00	0.50	5.00	6.71	0.00	6.71
14.70	2.00	0.50	5.00	6.71	0.00	6.71
14.75	2.00	0.50	5.00	6.71	0.00	6.71
14.80	2.00	0.50	5.00	6.71	0.00	6.71
14.85	2.00	0.50	5.00	6.71	0.00	6.71
14.90	2.00	0.50	5.00	6.71	0.00	6.71
14.95	2.00	0.50	5.00	6.71	0.00	6.71
15.00	0.20	0.50	0.41*	6.71	0.00	6.71
15.05	0.20	0.50	0.41*	6.69	0.00	6.69
15.10	0.20	0.50	0.40*	6.68	0.00	6.68
15.15	0.20	0.50	0.40*	6.66	0.00	6.66
15.20	0.20	0.50	0.40*	6.65	0.00	6.65
15.25	0.20	0.50	0.40*	6.63	0.00	6.63
15.30	0.20	0.50	0.39*	6.62	0.00	6.62
15.35	0.20	0.50	0.39*	6.60	0.00	6.60
15.40	0.20	0.50	0.39*	6.59	0.00	6.59
15.45	0.20	0.50	0.39*	6.57	0.00	6.57
15.50	0.19	0.51	0.38*	6.55	0.00	6.55
15.55	0.19	0.51	0.38*	6.54	0.00	6.54
15.60	0.19	0.51	0.38*	6.52	0.00	6.52
15.65	0.19	0.51	0.38*	6.51	0.00	6.51
15.70	0.19	0.51	0.38*	6.49	0.00	6.49
15.75	0.19	0.51	0.37*	6.47	0.00	6.47
15.80	0.19	0.51	0.37*	6.46	0.00	6.46
15.85	0.19	0.51	0.37*	6.44	0.00	6.44
15.90	0.19	0.51	0.37*	6.42	0.00	6.42
15.95	0.19	0.51	0.36*	6.41	0.00	6.41
16.00	0.18	0.51	0.36*	6.39	0.00	6.39
16.05	0.18	0.51	0.36*	6.38	0.00	6.38

16.10	0.18	0.51	0.36*	6.36	0.00	6.36
16.15	0.18	0.51	0.36*	6.34	0.00	6.34
16.20	0.18	0.51	0.35*	6.33	0.00	6.33
16.25	0.18	0.51	0.35*	6.31	0.00	6.31
16.30	0.18	0.51	0.35*	6.29	0.00	6.29
16.35	0.18	0.51	0.35*	6.28	0.00	6.28
16.40	0.18	0.51	0.34*	6.26	0.00	6.26
16.45	0.18	0.51	0.34*	6.24	0.00	6.24
16.50	0.17	0.51	0.34*	6.22	0.00	6.22
16.55	0.17	0.51	0.34*	6.21	0.00	6.21
16.60	0.17	0.52	0.34*	6.19	0.00	6.19
16.65	0.17	0.52	0.33*	6.17	0.00	6.17
16.70	0.17	0.52	0.33*	6.16	0.00	6.16
16.75	0.17	0.52	0.33*	6.14	0.00	6.14
16.80	0.17	0.52	0.33*	6.12	0.00	6.12
16.85	0.17	0.52	0.33*	6.10	0.00	6.10
16.90	0.17	0.52	0.32*	6.09	0.00	6.09
16.95	0.17	0.52	0.32*	6.07	0.00	6.07
17.00	0.17	0.52	0.32*	6.05	0.00	6.05
17.05	0.17	0.52	0.32*	6.03	0.00	6.03
17.10	0.17	0.52	0.32*	6.01	0.00	6.01
17.15	0.16	0.52	0.32*	6.00	0.00	6.00
17.20	0.16	0.52	0.32*	5.98	0.00	5.98
17.25	0.16	0.52	0.32*	5.96	0.00	5.96
17.30	0.16	0.52	0.32*	5.94	0.00	5.94
17.35	0.16	0.52	0.32*	5.93	0.00	5.93
17.40	0.16	0.52	0.32*	5.91	0.00	5.91
17.45	0.16	0.52	0.31*	5.89	0.00	5.89
17.50	0.16	0.52	0.31*	5.87	0.00	5.87
17.55	0.16	0.52	0.31*	5.85	0.00	5.85
17.60	0.16	0.52	0.31*	5.84	0.00	5.84
17.65	0.16	0.52	0.31*	5.82	0.00	5.82
17.70	0.16	0.52	0.31*	5.80	0.00	5.80
17.75	0.16	0.52	0.31*	5.78	0.00	5.78
17.80	0.16	0.52	0.31*	5.77	0.00	5.77
17.85	0.16	0.52	0.31*	5.75	0.00	5.75
17.90	0.16	0.53	0.31*	5.73	0.00	5.73
17.95	0.16	0.53	0.31*	5.71	0.00	5.71
18.00	0.16	0.53	0.31*	5.69	0.00	5.69
18.05	0.18	0.53	0.33*	5.68	0.00	5.68
18.10	0.19	0.53	0.35*	5.66	0.00	5.66
18.15	0.20	0.53	0.38*	5.64	0.00	5.64
18.20	0.21	0.53	0.40*	5.63	0.00	5.63
18.25	0.22	0.53	0.42*	5.61	0.00	5.61
18.30	0.23	0.53	0.44*	5.60	0.00	5.60
18.35	0.25	0.53	0.47*	5.58	0.00	5.58
18.40	0.26	0.53	0.49*	5.57	0.00	5.57
18.45	0.27	0.53	0.51*	5.56	0.00	5.56
18.50	0.29	0.53	0.54*	5.55	0.00	5.55
18.55	0.30	0.53	0.57*	5.53	0.00	5.53
18.60	0.32	0.53	0.60*	5.52	0.00	5.52
18.65	0.34	0.53	0.63*	5.51	0.00	5.51
18.70	0.36	0.53	0.67*	5.50	0.00	5.50
18.75	0.38	0.53	0.71*	5.50	0.00	5.50
18.80	0.41	0.53	0.76*	5.49	0.00	5.49
18.85	0.45	0.53	0.84*	5.48	0.00	5.48
18.90	2.30	0.53	4.32	5.48	0.00	5.48
18.95	2.30	0.53	4.32	5.48	0.00	5.48
19.00	2.30	0.53	4.32	5.48	0.00	5.48
19.05	2.30	0.53	4.31	5.48	0.00	5.48
19.10	2.30	0.53	4.31	5.48	0.00	5.48
19.15	2.30	0.53	4.31	5.48	0.00	5.48
19.20	2.30	0.53	4.31	5.48	0.00	5.48
19.25	2.30	0.53	4.30	5.48	0.00	5.48
19.30	2.30	0.53	4.30	5.48	0.00	5.48
19.35	2.30	0.54	4.30	5.48	0.00	5.48
19.40	0.55	0.54	1.02	5.48	0.00	5.48
19.45	0.49	0.54	0.92*	5.48	0.00	5.48
19.50	0.46	0.54	0.87*	5.47	0.00	5.47
19.55	0.45	0.54	0.83*	5.47	0.00	5.47
19.60	0.43	0.54	0.81*	5.46	0.00	5.46
19.65	0.42	0.54	0.79*	5.46	0.00	5.46
19.70	0.41	0.54	0.77*	5.45	0.00	5.45
19.75	0.40	0.54	0.75*	5.45	0.00	5.45
19.80	0.40	0.54	0.74*	5.44	0.00	5.44
19.85	0.39	0.54	0.72*	5.43	0.00	5.43
19.90	0.38	0.54	0.71*	5.43	0.00	5.43
19.95	0.37	0.54	0.70*	5.42	0.00	5.42
20.00	0.37	0.54	0.68*	5.41	0.00	5.41
20.05	0.36	0.54	0.67*	5.40	0.00	5.40
20.10	0.36	0.54	0.66*	5.40	0.00	5.40
20.15	0.35	0.54	0.65*	5.39	0.00	5.39
20.20	0.35	0.54	0.64*	5.38	0.00	5.38
20.25	0.34	0.54	0.63*	5.37	0.00	5.37
20.30	0.34	0.54	0.62*	5.36	0.00	5.36
20.35	0.33	0.54	0.61*	5.35	0.00	5.35
20.40	0.33	0.54	0.60*	5.34	0.00	5.34
20.45	0.32	0.54	0.59*	5.33	0.00	5.33
20.50	0.32	0.54	0.59*	5.32	0.00	5.32
20.55	0.31	0.54	0.58*	5.31	0.00	5.31
20.60	0.31	0.54	0.57*	5.30	0.00	5.30
20.65	0.30	0.54	0.56*	5.29	0.00	5.29
20.70	0.30	0.54	0.55*	5.28	0.00	5.28
20.75	0.30	0.54	0.55*	5.27	0.00	5.27
20.80	0.29	0.54	0.54*	5.26	0.00	5.26
20.85	0.29	0.54	0.53*	5.25	0.00	5.25
20.90	0.29	0.54	0.52*	5.23	0.00	5.23
20.95	0.28	0.54	0.52*	5.22	0.00	5.22
21.00	0.28	0.54	0.51*	5.21	0.00	5.21
21.05	0.28	0.54	0.51*	5.20	0.00	5.20
21.10	0.28	0.55	0.51*	5.19	0.00	5.19
21.15	0.28	0.55	0.52*	5.17	0.00	5.17
21.20	0.28	0.55	0.52*	5.16	0.00	5.16
21.25	0.28	0.55	0.52*	5.15	0.00	5.15
21.30	0.28	0.55	0.52*	5.14	0.00	5.14
21.35	0.29	0.55	0.52*	5.13	0.00	5.13
21.40	0.29	0.55	0.53*	5.12	0.00	5.12
21.45	0.29	0.55	0.53*	5.10	0.00	5.10
21.50	0.29	0.55	0.53*	5.09	0.00	5.09
21.55	0.29	0.55	0.53*	5.08	0.00	5.08
21.60	0.29	0.55	0.53*	5.07	0.00	5.07
21.65	0.29	0.55	0.53*	5.06	0.00	5.06
21.70	0.29	0.55	0.54*	5.05	0.00	5.05
21.75	0.30	0.55	0.54*	5.04	0.00	5.04
21.80	0.30	0.55	0.54*	5.02	0.00	5.02
21.85	0.30	0.55	0.54*	5.01	0.00	5.01
21.90	0.30	0.55	0.54*	5.00	0.00	5.00
21.95	0.30	0.55	0.55*	4.99	0.00	4.99
22.00	0.30	0.55	0.55*	4.98	0.00	4.98
22.05	0.30	0.55	0.55*	4.97	0.00	4.97
22.10	0.30	0.55	0.55*	4.96	0.00	4.96
22.15	0.31	0.55	0.55*	4.95	0.00	4.95
22.20	0.31	0.55	0.56*	4.94	0.00	4.94
22.25	0.31	0.55	0.56*	4.92	0.00	4.92
22.30	0.31	0.55	0.56*	4.91	0.00	4.91
22.35	0.31	0.55	0.56*	4.90	0.00	4.90
22.40	0.31	0.55	0.56*	4.89	0.00	4.89
22.45	0.31	0.55	0.57*	4.88	0.00	4.88
22.50	0.31	0.55	0.57*	4.87	0.00	4.87
22.55	0.32	0.55	0.57*	4.86	0.00	4.86
22.60	0.32	0.55	0.57*	4.85	0.00	4.85
22.65	0.32	0.55	0.58*	4.84	0.00	4.84
22.70	0.32	0.55	0.58*	4.83	0.00	4.83
22.75	0.32	0.55	0.58*	4.82	0.00	4.82
22.80	0.32	0.55	0.58*	4.81	0.00	4.81
22.85	0.32	0.55	0.58*	4.80	0.00	4.80
22.90	0.32	0.55	0.59*	4.79	0.00	4.79
22.95	0.33	0.55	0.59*	4.78	0.00	4.78

23.00	0.33	0.55	0.59*	4.77	0.00	4.77
23.05	0.32	0.55	0.58*	4.76	0.00	4.76
23.10	0.32	0.55	0.58*	4.75	0.00	4.75
23.15	0.32	0.55	0.57*	4.74	0.00	4.74
23.20	0.31	0.55	0.56*	4.73	0.00	4.73
23.25	0.31	0.56	0.56*	4.72	0.00	4.72
23.30	0.31	0.56	0.55*	4.70	0.00	4.70
23.35	0.30	0.56	0.55*	4.69	0.00	4.69
23.40	0.30	0.56	0.54*	4.68	0.00	4.68
23.45	0.30	0.56	0.53*	4.67	0.00	4.67
23.50	0.29	0.56	0.53*	4.66	0.00	4.66
23.55	0.29	0.56	0.52*	4.65	0.00	4.65
23.60	0.29	0.56	0.52*	4.64	0.00	4.64
23.65	0.28	0.56	0.51*	4.63	0.00	4.63
23.70	0.28	0.56	0.51*	4.61	0.00	4.61
23.75	0.28	0.56	0.50*	4.60	0.00	4.60
23.80	0.28	0.56	0.49*	4.59	0.00	4.59
23.85	0.27	0.56	0.49*	4.58	0.00	4.58
23.90	0.27	0.56	0.48*	4.57	0.00	4.57
23.95	0.27	0.56	0.48*	4.55	0.00	4.55
24.00	0.26	0.56	0.47*	4.54	0.00	4.54
24.05	0.26	0.56	0.47*	4.53	0.00	4.53
24.10	0.26	0.56	0.46*	4.52	0.00	4.52
24.15	0.26	0.56	0.46*	4.50	0.00	4.50
24.20	0.25	0.56	0.46*	4.49	0.00	4.49
24.25	0.25	0.56	0.45*	4.48	0.00	4.48
24.30	0.25	0.56	0.45*	4.47	0.00	4.47
24.35	0.25	0.56	0.44*	4.45	0.00	4.45
24.40	0.24	0.56	0.44*	4.44	0.00	4.44
24.45	0.24	0.56	0.43*	4.43	0.00	4.43
24.50	0.24	0.56	0.43*	4.41	0.00	4.41
24.55	0.24	0.56	0.42*	4.40	0.00	4.40
24.60	0.23	0.56	0.42*	4.39	0.00	4.39
24.65	0.23	0.56	0.41*	4.37	0.00	4.37
24.70	0.23	0.56	0.41*	4.36	0.00	4.36
24.75	0.23	0.56	0.41*	4.34	0.00	4.34
24.80	0.23	0.56	0.40*	4.33	0.00	4.33
24.85	0.22	0.56	0.40*	4.32	0.00	4.32
24.90	0.22	0.56	0.39*	4.30	0.00	4.30
24.95	0.22	0.56	0.39*	4.29	0.00	4.29
25.00	0.22	0.56	0.38*	4.27	0.00	4.27
25.05	0.22	0.56	0.38*	4.26	0.00	4.26
25.10	0.22	0.56	0.38*	4.24	0.00	4.24
25.15	0.22	0.56	0.38*	4.23	0.00	4.23
25.20	0.22	0.56	0.38*	4.21	0.00	4.21
25.25	0.22	0.56	0.38*	4.20	0.00	4.20
25.30	0.22	0.56	0.38*	4.18	0.00	4.18
25.35	0.21	0.56	0.38*	4.17	0.00	4.17
25.40	0.21	0.56	0.38*	4.15	0.00	4.15
25.45	0.21	0.56	0.38*	4.14	0.00	4.14
25.50	0.21	0.56	0.38*	4.13	0.00	4.13
25.55	0.21	0.56	0.38*	4.11	0.00	4.11
25.60	0.21	0.56	0.38*	4.10	0.00	4.10
25.65	0.21	0.56	0.38*	4.08	0.00	4.08
25.70	0.21	0.56	0.38*	4.07	0.00	4.07
25.75	0.21	0.56	0.38*	4.05	0.00	4.05
25.80	0.21	0.56	0.38*	4.04	0.00	4.04
25.85	0.21	0.56	0.38*	4.02	0.00	4.02
25.90	0.21	0.56	0.38*	4.01	0.00	4.01
25.95	0.21	0.56	0.38*	3.99	0.00	3.99
26.00	0.21	0.57	0.38*	3.98	0.00	3.98
26.05	0.21	0.57	0.38*	3.96	0.00	3.96
26.10	0.21	0.57	0.38*	3.95	0.00	3.95
26.15	0.21	0.57	0.38*	3.93	0.00	3.93
26.20	0.21	0.57	0.38*	3.92	0.00	3.92
26.25	0.21	0.57	0.38*	3.90	0.00	3.90
26.30	0.21	0.57	0.38*	3.89	0.00	3.89
26.35	0.21	0.57	0.37*	3.87	0.00	3.87
26.40	0.21	0.57	0.37*	3.86	0.00	3.86
26.45	0.21	0.57	0.37*	3.84	0.00	3.84
26.50	0.21	0.57	0.37*	3.83	0.00	3.83
26.55	0.21	0.57	0.37*	3.81	0.00	3.81
26.60	0.21	0.57	0.37*	3.80	0.00	3.80
26.65	0.21	0.57	0.37*	3.78	0.00	3.78
26.70	0.21	0.57	0.37*	3.77	0.00	3.77
26.75	0.21	0.57	0.37*	3.75	0.00	3.75
26.80	0.21	0.57	0.37*	3.74	0.00	3.74
26.85	0.21	0.57	0.37*	3.72	0.00	3.72
26.90	0.21	0.57	0.37*	3.71	0.00	3.71
26.95	0.21	0.57	0.37*	3.69	0.00	3.69
27.00	0.21	0.57	0.37*	3.68	0.00	3.68
27.05	2.00	0.57	5.00	3.66	0.00	3.66
27.10	2.00	0.57	5.00	3.66	0.00	3.66
27.15	2.00	0.57	5.00	3.66	0.00	3.66
27.20	2.00	0.57	5.00	3.66	0.00	3.66
27.25	2.00	0.57	5.00	3.66	0.00	3.66
27.30	2.00	0.57	5.00	3.66	0.00	3.66
27.35	2.00	0.57	5.00	3.66	0.00	3.66
27.40	2.00	0.57	5.00	3.66	0.00	3.66
27.45	2.00	0.57	5.00	3.66	0.00	3.66
27.50	2.00	0.57	5.00	3.66	0.00	3.66
27.55	2.00	0.57	5.00	3.66	0.00	3.66
27.60	2.00	0.57	5.00	3.66	0.00	3.66
27.65	2.00	0.57	5.00	3.66	0.00	3.66
27.70	2.00	0.57	5.00	3.66	0.00	3.66
27.75	2.00	0.57	5.00	3.66	0.00	3.66
27.80	2.00	0.57	5.00	3.66	0.00	3.66
27.85	2.00	0.57	5.00	3.66	0.00	3.66
27.90	2.00	0.57	5.00	3.66	0.00	3.66
27.95	2.00	0.57	5.00	3.66	0.00	3.66
28.00	2.00	0.57	5.00	3.66	0.00	3.66
28.05	2.00	0.57	5.00	3.66	0.00	3.66
28.10	2.00	0.57	5.00	3.66	0.00	3.66
28.15	2.00	0.57	5.00	3.66	0.00	3.66
28.20	2.00	0.57	5.00	3.66	0.00	3.66
28.25	2.00	0.57	5.00	3.66	0.00	3.66
28.30	2.00	0.57	5.00	3.66	0.00	3.66
28.35	2.00	0.57	5.00	3.66	0.00	3.66
28.40	2.00	0.57	5.00	3.66	0.00	3.66
28.45	2.00	0.57	5.00	3.66	0.00	3.66
28.50	2.00	0.57	5.00	3.66	0.00	3.66
28.55	2.00	0.57	5.00	3.66	0.00	3.66
28.60	2.00	0.57	5.00	3.66	0.00	3.66
28.65	2.00	0.57	5.00	3.66	0.00	3.66
28.70	2.00	0.57	5.00	3.66	0.00	3.66
28.75	2.00	0.57	5.00	3.66	0.00	3.66
28.80	2.00	0.57	5.00	3.66	0.00	3.66
28.85	2.00	0.57	5.00	3.66	0.00	3.66
28.90	2.00	0.57	5.00	3.66	0.00	3.66
28.95	2.00	0.57	5.00	3.66	0.00	3.66
29.00	2.00	0.57	5.00	3.66	0.00	3.66
29.05	2.00	0.57	5.00	3.66	0.00	3.66
29.10	2.00	0.57	5.00	3.66	0.00	3.66
29.15	2.00	0.57	5.00	3.66	0.00	3.66
29.20	2.00	0.57	5.00	3.66	0.00	3.66
29.25	2.00	0.57	5.00	3.66	0.00	3.66
29.30	2.00	0.57	5.00	3.66	0.00	3.66
29.35	2.00	0.57	5.00	3.66	0.00	3.66
29.40	2.00	0.57	5.00	3.66	0.00	3.66
29.45	2.00	0.57	5.00	3.66	0.00	3.66
29.50	2.00	0.57	5.00	3.66	0.00	3.66
29.55	2.00	0.57	5.00	3.66	0.00	3.66
29.60	2.00	0.57	5.00	3.66	0.00	3.66
29.65	2.00	0.57	5.00	3.66	0.00	3.66
29.70	2.00	0.57	5.00	3.66	0.00	3.66
29.75	2.00	0.57	5.00	3.66	0.00	3.66
29.80	2.00	0.58	5.00	3.66	0.00	3.66
29.85	2.00	0.58	5.00	3.66	0.00	3.66

29.90	2.00	0.58	5.00	3.66	0.00	3.66
29.95	2.00	0.58	5.00	3.66	0.00	3.66
30.00	2.00	0.58	5.00	3.66	0.00	3.66
30.05	2.00	0.58	5.00	3.66	0.00	3.66
30.10	2.00	0.58	5.00	3.66	0.00	3.66
30.15	2.00	0.58	5.00	3.66	0.00	3.66
30.20	2.00	0.58	5.00	3.66	0.00	3.66
30.25	2.00	0.57	5.00	3.66	0.00	3.66
30.30	2.00	0.57	5.00	3.66	0.00	3.66
30.35	2.00	0.57	5.00	3.66	0.00	3.66
30.40	2.00	0.57	5.00	3.66	0.00	3.66
30.45	2.00	0.57	5.00	3.66	0.00	3.66
30.50	2.00	0.57	5.00	3.66	0.00	3.66
30.55	2.00	0.57	5.00	3.66	0.00	3.66
30.60	2.00	0.57	5.00	3.66	0.00	3.66
30.65	2.00	0.57	5.00	3.66	0.00	3.66
30.70	2.00	0.57	5.00	3.66	0.00	3.66
30.75	2.00	0.57	5.00	3.66	0.00	3.66
30.80	2.00	0.57	5.00	3.66	0.00	3.66
30.85	2.00	0.57	5.00	3.66	0.00	3.66
30.90	2.00	0.57	5.00	3.66	0.00	3.66
30.95	2.00	0.57	5.00	3.66	0.00	3.66
31.00	2.00	0.57	5.00	3.66	0.00	3.66
31.05	2.00	0.57	5.00	3.66	0.00	3.66
31.10	2.00	0.57	5.00	3.66	0.00	3.66
31.15	2.00	0.57	5.00	3.66	0.00	3.66
31.20	2.00	0.57	5.00	3.66	0.00	3.66
31.25	2.00	0.57	5.00	3.66	0.00	3.66
31.30	2.00	0.57	5.00	3.66	0.00	3.66
31.35	2.00	0.57	5.00	3.66	0.00	3.66
31.40	2.00	0.57	5.00	3.66	0.00	3.66
31.45	2.00	0.57	5.00	3.66	0.00	3.66
31.50	2.00	0.57	5.00	3.66	0.00	3.66
31.55	2.00	0.57	5.00	3.66	0.00	3.66
31.60	2.00	0.57	5.00	3.66	0.00	3.66
31.65	2.00	0.57	5.00	3.66	0.00	3.66
31.70	2.00	0.57	5.00	3.66	0.00	3.66
31.75	2.00	0.57	5.00	3.66	0.00	3.66
31.80	2.00	0.57	5.00	3.66	0.00	3.66
31.85	2.00	0.57	5.00	3.66	0.00	3.66
31.90	2.00	0.57	5.00	3.66	0.00	3.66
31.95	2.00	0.57	5.00	3.66	0.00	3.66
32.00	2.00	0.57	5.00	3.66	0.00	3.66
32.05	2.00	0.57	5.00	3.66	0.00	3.66
32.10	2.00	0.57	5.00	3.66	0.00	3.66
32.15	2.00	0.57	5.00	3.66	0.00	3.66
32.20	2.00	0.57	5.00	3.66	0.00	3.66
32.25	2.00	0.57	5.00	3.66	0.00	3.66
32.30	2.00	0.57	5.00	3.66	0.00	3.66
32.35	2.00	0.57	5.00	3.66	0.00	3.66
32.40	2.00	0.57	5.00	3.66	0.00	3.66
32.45	2.00	0.57	5.00	3.66	0.00	3.66
32.50	2.00	0.57	5.00	3.66	0.00	3.66
32.55	2.00	0.57	5.00	3.66	0.00	3.66
32.60	2.00	0.57	5.00	3.66	0.00	3.66
32.65	2.00	0.57	5.00	3.66	0.00	3.66
32.70	2.00	0.57	5.00	3.66	0.00	3.66
32.75	2.00	0.57	5.00	3.66	0.00	3.66
32.80	2.00	0.57	5.00	3.66	0.00	3.66
32.85	2.00	0.57	5.00	3.66	0.00	3.66
32.90	2.00	0.57	5.00	3.66	0.00	3.66
32.95	2.00	0.57	5.00	3.66	0.00	3.66
33.00	2.00	0.57	5.00	3.66	0.00	3.66
33.05	2.00	0.57	5.00	3.66	0.00	3.66
33.10	2.00	0.57	5.00	3.66	0.00	3.66
33.15	2.00	0.57	5.00	3.66	0.00	3.66
33.20	2.00	0.57	5.00	3.66	0.00	3.66
33.25	2.00	0.57	5.00	3.66	0.00	3.66
33.30	2.00	0.57	5.00	3.66	0.00	3.66
33.35	2.00	0.57	5.00	3.66	0.00	3.66
33.40	2.00	0.57	5.00	3.66	0.00	3.66
33.45	2.00	0.57	5.00	3.66	0.00	3.66
33.50	2.00	0.57	5.00	3.66	0.00	3.66
33.55	2.00	0.57	5.00	3.66	0.00	3.66
33.60	2.00	0.57	5.00	3.66	0.00	3.66
33.65	2.00	0.57	5.00	3.66	0.00	3.66
33.70	2.00	0.57	5.00	3.66	0.00	3.66
33.75	2.00	0.57	5.00	3.66	0.00	3.66
33.80	2.00	0.57	5.00	3.66	0.00	3.66
33.85	2.00	0.57	5.00	3.66	0.00	3.66
33.90	2.00	0.57	5.00	3.66	0.00	3.66
33.95	2.00	0.57	5.00	3.66	0.00	3.66
34.00	2.00	0.57	5.00	3.66	0.00	3.66
34.05	0.17	0.57	0.30*	3.66	0.00	3.66
34.10	0.17	0.57	0.30*	3.65	0.00	3.65
34.15	0.17	0.57	0.30*	3.63	0.00	3.63
34.20	0.17	0.57	0.30*	3.61	0.00	3.61
34.25	0.17	0.57	0.30*	3.59	0.00	3.59
34.30	0.17	0.57	0.30*	3.58	0.00	3.58
34.35	0.17	0.57	0.30*	3.56	0.00	3.56
34.40	0.17	0.57	0.30*	3.54	0.00	3.54
34.45	0.17	0.57	0.30*	3.53	0.00	3.53
34.50	0.17	0.57	0.30*	3.51	0.00	3.51
34.55	0.17	0.57	0.30*	3.49	0.00	3.49
34.60	0.17	0.57	0.30*	3.47	0.00	3.47
34.65	0.17	0.57	0.30*	3.46	0.00	3.46
34.70	0.17	0.57	0.30*	3.44	0.00	3.44
34.75	0.17	0.57	0.30*	3.42	0.00	3.42
34.80	0.17	0.57	0.30*	3.40	0.00	3.40
34.85	0.17	0.57	0.30*	3.39	0.00	3.39
34.90	0.17	0.57	0.30*	3.37	0.00	3.37
34.95	0.17	0.57	0.30*	3.35	0.00	3.35
35.00	0.17	0.56	0.30*	3.34	0.00	3.34
35.05	0.17	0.56	0.30*	3.32	0.00	3.32
35.10	0.17	0.56	0.30*	3.30	0.00	3.30
35.15	0.17	0.56	0.30*	3.28	0.00	3.28
35.20	0.17	0.56	0.30*	3.27	0.00	3.27
35.25	0.17	0.56	0.30*	3.25	0.00	3.25
35.30	0.17	0.56	0.30*	3.23	0.00	3.23
35.35	0.17	0.56	0.30*	3.21	0.00	3.21
35.40	0.17	0.56	0.30*	3.20	0.00	3.20
35.45	0.17	0.56	0.30*	3.18	0.00	3.18
35.50	0.17	0.56	0.30*	3.16	0.00	3.16
35.55	0.17	0.56	0.30*	3.14	0.00	3.14
35.60	0.17	0.56	0.30*	3.13	0.00	3.13
35.65	0.17	0.56	0.30*	3.11	0.00	3.11
35.70	0.17	0.56	0.30*	3.09	0.00	3.09
35.75	0.17	0.56	0.30*	3.07	0.00	3.07
35.80	0.17	0.56	0.30*	3.06	0.00	3.06
35.85	0.17	0.56	0.30*	3.04	0.00	3.04
35.90	0.17	0.56	0.30*	3.02	0.00	3.02
35.95	0.17	0.56	0.30*	3.01	0.00	3.01
36.00	0.17	0.56	0.30*	2.99	0.00	2.99
36.05	0.17	0.56	0.30*	2.97	0.00	2.97
36.10	0.17	0.56	0.30*	2.95	0.00	2.95
36.15	0.17	0.56	0.30*	2.94	0.00	2.94
36.20	0.17	0.56	0.30*	2.92	0.00	2.92
36.25	0.17	0.56	0.30*	2.90	0.00	2.90
36.30	0.17	0.56	0.30*	2.88	0.00	2.88
36.35	0.17	0.56	0.30*	2.87	0.00	2.87
36.40	0.17	0.56	0.31*	2.85	0.00	2.85
36.45	0.17	0.56	0.31*	2.83	0.00	2.83
36.50	0.17	0.56	0.31*	2.81	0.00	2.81
36.55	0.17	0.56	0.31*	2.80	0.00	2.80
36.60	0.17	0.56	0.31*	2.78	0.00	2.78
36.65	0.17	0.56	0.31*	2.76	0.00	2.76
36.70	0.17	0.56	0.31*	2.75	0.00	2.75
36.75	0.17	0.56	0.31*	2.73	0.00	2.73

36.80	0.17	0.56	0.31*	2.71	0.00	2.71
36.85	0.17	0.56	0.31*	2.69	0.00	2.69
36.90	0.17	0.56	0.31*	2.68	0.00	2.68
36.95	0.17	0.56	0.31*	2.66	0.00	2.66
37.00	0.17	0.56	0.31*	2.64	0.00	2.64
37.05	0.17	0.56	0.31*	2.62	0.00	2.62
37.10	0.17	0.56	0.31*	2.61	0.00	2.61
37.15	0.17	0.56	0.31*	2.59	0.00	2.59
37.20	0.17	0.56	0.31*	2.57	0.00	2.57
37.25	0.17	0.56	0.31*	2.56	0.00	2.56
37.30	0.17	0.56	0.31*	2.54	0.00	2.54
37.35	0.17	0.56	0.31*	2.52	0.00	2.52
37.40	0.17	0.56	0.31*	2.50	0.00	2.50
37.45	0.17	0.56	0.31*	2.49	0.00	2.49
37.50	0.17	0.56	0.31*	2.47	0.00	2.47
37.55	0.17	0.56	0.31*	2.45	0.00	2.45
37.60	0.17	0.56	0.31*	2.43	0.00	2.43
37.65	0.17	0.56	0.31*	2.42	0.00	2.42
37.70	0.17	0.56	0.31*	2.40	0.00	2.40
37.75	0.17	0.56	0.31*	2.38	0.00	2.38
37.80	0.17	0.56	0.31*	2.37	0.00	2.37
37.85	0.17	0.56	0.31*	2.35	0.00	2.35
37.90	0.17	0.56	0.31*	2.33	0.00	2.33
37.95	0.17	0.56	0.31*	2.31	0.00	2.31
38.00	0.17	0.56	0.31*	2.30	0.00	2.30
38.05	0.17	0.56	0.31*	2.28	0.00	2.28
38.10	0.17	0.56	0.31*	2.26	0.00	2.26
38.15	0.17	0.56	0.31*	2.25	0.00	2.25
38.20	0.17	0.56	0.31*	2.23	0.00	2.23
38.25	0.17	0.56	0.31*	2.21	0.00	2.21
38.30	0.17	0.56	0.31*	2.19	0.00	2.19
38.35	0.17	0.56	0.31*	2.18	0.00	2.18
38.40	0.17	0.56	0.31*	2.16	0.00	2.16
38.45	0.17	0.56	0.32*	2.14	0.00	2.14
38.50	0.18	0.55	0.32*	2.13	0.00	2.13
38.55	0.18	0.55	0.32*	2.11	0.00	2.11
38.60	0.18	0.55	0.32*	2.09	0.00	2.09
38.65	0.18	0.55	0.32*	2.08	0.00	2.08
38.70	0.18	0.55	0.32*	2.06	0.00	2.06
38.75	0.18	0.55	0.32*	2.04	0.00	2.04
38.80	0.18	0.55	0.32*	2.02	0.00	2.02
38.85	0.18	0.55	0.32*	2.01	0.00	2.01
38.90	0.18	0.55	0.32*	1.99	0.00	1.99
38.95	0.18	0.55	0.32*	1.97	0.00	1.97
39.00	0.18	0.55	0.32*	1.96	0.00	1.96
39.05	0.18	0.55	0.32*	1.94	0.00	1.94
39.10	0.18	0.55	0.32*	1.92	0.00	1.92
39.15	0.18	0.55	0.32*	1.90	0.00	1.90
39.20	0.18	0.55	0.32*	1.89	0.00	1.89
39.25	0.18	0.55	0.32*	1.87	0.00	1.87
39.30	0.18	0.55	0.32*	1.85	0.00	1.85
39.35	0.18	0.55	0.32*	1.84	0.00	1.84
39.40	0.18	0.55	0.32*	1.82	0.00	1.82
39.45	0.18	0.55	0.32*	1.80	0.00	1.80
39.50	0.18	0.55	0.32*	1.79	0.00	1.79
39.55	0.18	0.55	0.32*	1.77	0.00	1.77
39.60	0.18	0.55	0.32*	1.75	0.00	1.75
39.65	0.18	0.55	0.32*	1.74	0.00	1.74
39.70	0.18	0.55	0.32*	1.72	0.00	1.72
39.75	0.18	0.55	0.32*	1.70	0.00	1.70
39.80	0.18	0.55	0.32*	1.68	0.00	1.68
39.85	0.18	0.55	0.32*	1.67	0.00	1.67
39.90	0.18	0.55	0.32*	1.65	0.00	1.65
39.95	0.18	0.55	0.32*	1.63	0.00	1.63
40.00	0.18	0.55	0.32*	1.62	0.00	1.62
40.05	0.18	0.55	0.32*	1.60	0.00	1.60
40.10	0.18	0.55	0.32*	1.58	0.00	1.58
40.15	0.18	0.55	0.32*	1.57	0.00	1.57
40.20	0.18	0.55	0.32*	1.55	0.00	1.55
40.25	0.18	0.55	0.32*	1.53	0.00	1.53
40.30	0.18	0.55	0.32*	1.52	0.00	1.52
40.35	0.18	0.55	0.32*	1.50	0.00	1.50
40.40	0.18	0.55	0.32*	1.48	0.00	1.48
40.45	0.18	0.55	0.33*	1.46	0.00	1.46
40.50	0.18	0.55	0.33*	1.45	0.00	1.45
40.55	0.18	0.55	0.33*	1.43	0.00	1.43
40.60	0.18	0.55	0.33*	1.41	0.00	1.41
40.65	0.18	0.55	0.33*	1.40	0.00	1.40
40.70	0.18	0.55	0.33*	1.38	0.00	1.38
40.75	0.18	0.55	0.33*	1.36	0.00	1.36
40.80	0.18	0.55	0.33*	1.35	0.00	1.35
40.85	0.18	0.55	0.33*	1.33	0.00	1.33
40.90	0.18	0.55	0.33*	1.31	0.00	1.31
40.95	0.18	0.55	0.33*	1.30	0.00	1.30
41.00	0.18	0.55	0.33*	1.28	0.00	1.28
41.05	0.19	0.55	0.35*	1.26	0.00	1.26
41.10	0.20	0.55	0.36*	1.25	0.00	1.25
41.15	0.21	0.55	0.38*	1.23	0.00	1.23
41.20	0.22	0.55	0.40*	1.22	0.00	1.22
41.25	0.23	0.55	0.42*	1.20	0.00	1.20
41.30	0.24	0.55	0.44*	1.19	0.00	1.19
41.35	0.25	0.55	0.45*	1.17	0.00	1.17
41.40	0.26	0.55	0.47*	1.16	0.00	1.16
41.45	0.27	0.55	0.49*	1.15	0.00	1.15
41.50	0.28	0.54	0.52*	1.14	0.00	1.14
41.55	0.29	0.54	0.54*	1.12	0.00	1.12
41.60	0.30	0.54	0.56*	1.11	0.00	1.11
41.65	0.31	0.54	0.58*	1.10	0.00	1.10
41.70	0.32	0.54	0.59*	1.09	0.00	1.09
41.75	0.33	0.54	0.62*	1.08	0.00	1.08
41.80	0.35	0.54	0.64*	1.07	0.00	1.07
41.85	0.36	0.54	0.66*	1.06	0.00	1.06
41.90	0.37	0.54	0.69*	1.05	0.00	1.05
41.95	0.39	0.54	0.71*	1.05	0.00	1.05
42.00	0.41	0.54	0.75*	1.04	0.00	1.04
42.05	0.43	0.54	0.79*	1.03	0.00	1.03
42.10	0.46	0.54	0.85*	1.03	0.00	1.03
42.15	0.54	0.54	1.00*	1.02	0.00	1.02
42.20	2.30	0.54	4.24	1.02	0.00	1.02
42.25	2.30	0.54	4.25	1.02	0.00	1.02
42.30	2.30	0.54	4.25	1.02	0.00	1.02
42.35	2.30	0.54	4.25	1.02	0.00	1.02
42.40	2.30	0.54	4.25	1.02	0.00	1.02
42.45	2.30	0.54	4.25	1.02	0.00	1.02
42.50	2.30	0.54	4.25	1.02	0.00	1.02
42.55	2.30	0.54	4.26	1.02	0.00	1.02
42.60	2.30	0.54	4.26	1.02	0.00	1.02
42.65	2.30	0.54	4.26	1.02	0.00	1.02
42.70	2.30	0.54	4.26	1.02	0.00	1.02
42.75	2.30	0.54	4.26	1.02	0.00	1.02
42.80	2.30	0.54	4.27	1.02	0.00	1.02
42.85	2.30	0.54	4.27	1.02	0.00	1.02
42.90	2.30	0.54	4.27	1.02	0.00	1.02
42.95	2.30	0.54	4.27	1.02	0.00	1.02
43.00	2.30	0.54	4.27	1.02	0.00	1.02
43.05	2.30	0.54	4.27	1.02	0.00	1.02
43.10	2.30	0.54	4.28	1.02	0.00	1.02
43.15	2.30	0.54	4.28	1.02	0.00	1.02
43.20	2.30	0.54	4.28	1.02	0.00	1.02
43.25	2.30	0.54	4.28	1.02	0.00	1.02
43.30	2.30	0.54	4.28	1.02	0.00	1.02
43.35	2.30	0.54	4.29	1.02	0.00	1.02
43.40	2.30	0.54	4.29	1.02	0.00	1.02
43.45	2.30	0.54	4.29	1.02	0.00	1.02
43.50	2.30	0.54	4.29	1.02	0.00	1.02
43.55	2.30	0.54	4.29	1.02	0.00	1.02
43.60	2.30	0.54	4.30	1.02	0.00	1.02
43.65	2.30	0.54	4.30	1.02	0.00	1.02

43.70	2.30	0.53	4.30	1.02	0.00	1.02
43.75	2.30	0.53	4.30	1.02	0.00	1.02
43.80	2.30	0.53	4.30	1.02	0.00	1.02
43.85	2.30	0.53	4.31	1.02	0.00	1.02
43.90	2.30	0.53	4.31	1.02	0.00	1.02
43.95	2.30	0.53	4.31	1.02	0.00	1.02
44.00	2.30	0.53	4.31	1.02	0.00	1.02
44.05	2.30	0.53	4.31	1.02	0.00	1.02
44.10	2.30	0.53	4.32	1.02	0.00	1.02
44.15	2.30	0.53	4.32	1.02	0.00	1.02
44.20	2.30	0.53	4.32	1.02	0.00	1.02
44.25	2.30	0.53	4.32	1.02	0.00	1.02
44.30	2.30	0.53	4.32	1.02	0.00	1.02
44.35	2.30	0.53	4.33	1.02	0.00	1.02
44.40	2.30	0.53	4.33	1.02	0.00	1.02
44.45	2.30	0.53	4.33	1.02	0.00	1.02
44.50	2.30	0.53	4.33	1.02	0.00	1.02
44.55	2.30	0.53	4.33	1.02	0.00	1.02
44.60	2.30	0.53	4.34	1.02	0.00	1.02
44.65	2.30	0.53	4.34	1.02	0.00	1.02
44.70	2.30	0.53	4.34	1.02	0.00	1.02
44.75	2.30	0.53	4.34	1.02	0.00	1.02
44.80	2.30	0.53	4.34	1.02	0.00	1.02
44.85	2.30	0.53	4.35	1.02	0.00	1.02
44.90	2.30	0.53	4.35	1.02	0.00	1.02
44.95	2.30	0.53	4.35	1.02	0.00	1.02
45.00	2.30	0.53	4.35	1.02	0.00	1.02
45.05	2.30	0.53	4.35	1.02	0.00	1.02
45.10	2.30	0.53	4.36	1.02	0.00	1.02
45.15	2.30	0.53	4.36	1.02	0.00	1.02
45.20	2.30	0.53	4.36	1.02	0.00	1.02
45.25	2.30	0.53	4.36	1.02	0.00	1.02
45.30	2.30	0.53	4.36	1.02	0.00	1.02
45.35	2.30	0.53	4.37	1.02	0.00	1.02
45.40	2.30	0.53	4.37	1.02	0.00	1.02
45.45	2.30	0.53	4.37	1.02	0.00	1.02
45.50	2.30	0.53	4.37	1.02	0.00	1.02
45.55	2.30	0.53	4.37	1.02	0.00	1.02
45.60	2.30	0.53	4.38	1.02	0.00	1.02
45.65	2.30	0.53	4.38	1.02	0.00	1.02
45.70	2.30	0.53	4.38	1.02	0.00	1.02
45.75	2.30	0.52	4.38	1.02	0.00	1.02
45.80	2.30	0.52	4.38	1.02	0.00	1.02
45.85	2.30	0.52	4.39	1.02	0.00	1.02
45.90	2.30	0.52	4.39	1.02	0.00	1.02
45.95	2.30	0.52	4.39	1.02	0.00	1.02
46.00	2.30	0.52	4.39	1.02	0.00	1.02
46.05	2.30	0.52	4.39	1.02	0.00	1.02
46.10	2.30	0.52	4.40	1.02	0.00	1.02
46.15	2.30	0.52	4.40	1.02	0.00	1.02
46.20	2.30	0.52	4.40	1.02	0.00	1.02
46.25	2.30	0.52	4.40	1.02	0.00	1.02
46.30	2.30	0.52	4.40	1.02	0.00	1.02
46.35	2.30	0.52	4.41	1.02	0.00	1.02
46.40	2.30	0.52	4.41	1.02	0.00	1.02
46.45	2.30	0.52	4.41	1.02	0.00	1.02
46.50	2.30	0.52	4.41	1.02	0.00	1.02
46.55	2.30	0.52	4.42	1.02	0.00	1.02
46.60	2.30	0.52	4.42	1.02	0.00	1.02
46.65	2.30	0.52	4.42	1.02	0.00	1.02
46.70	2.30	0.52	4.42	1.02	0.00	1.02
46.75	2.30	0.52	4.42	1.02	0.00	1.02
46.80	2.30	0.52	4.43	1.02	0.00	1.02
46.85	2.30	0.52	4.43	1.02	0.00	1.02
46.90	2.30	0.52	4.43	1.02	0.00	1.02
46.95	2.30	0.52	4.43	1.02	0.00	1.02
47.00	2.30	0.52	4.43	1.02	0.00	1.02
47.05	2.30	0.52	4.44	1.02	0.00	1.02
47.10	2.30	0.52	4.44	1.02	0.00	1.02
47.15	2.30	0.52	4.44	1.02	0.00	1.02
47.20	2.30	0.52	4.44	1.02	0.00	1.02
47.25	2.30	0.52	4.44	1.02	0.00	1.02
47.30	2.30	0.52	4.45	1.02	0.00	1.02
47.35	2.30	0.52	4.45	1.02	0.00	1.02
47.40	2.30	0.52	4.45	1.02	0.00	1.02
47.45	2.30	0.52	4.45	1.02	0.00	1.02
47.50	2.30	0.52	4.46	1.02	0.00	1.02
47.55	2.30	0.52	4.46	1.02	0.00	1.02
47.60	2.30	0.52	4.46	1.02	0.00	1.02
47.65	2.30	0.52	4.46	1.02	0.00	1.02
47.70	2.30	0.52	4.46	1.02	0.00	1.02
47.75	2.30	0.52	4.47	1.02	0.00	1.02
47.80	2.30	0.51	4.47	1.02	0.00	1.02
47.85	2.30	0.51	4.47	1.02	0.00	1.02
47.90	2.30	0.51	4.47	1.02	0.00	1.02
47.95	2.30	0.51	4.47	1.02	0.00	1.02
48.00	2.30	0.51	4.48	1.02	0.00	1.02
48.05	2.30	0.51	4.48	1.02	0.00	1.02
48.10	2.30	0.51	4.48	1.02	0.00	1.02
48.15	2.30	0.51	4.48	1.02	0.00	1.02
48.20	2.30	0.51	4.49	1.02	0.00	1.02
48.25	2.30	0.51	4.49	1.02	0.00	1.02
48.30	2.30	0.51	4.49	1.02	0.00	1.02
48.35	2.30	0.51	4.49	1.02	0.00	1.02
48.40	2.30	0.51	4.49	1.02	0.00	1.02
48.45	2.30	0.51	4.50	1.02	0.00	1.02
48.50	2.30	0.51	4.50	1.02	0.00	1.02
48.55	2.30	0.51	4.50	1.02	0.00	1.02
48.60	2.30	0.51	4.50	1.02	0.00	1.02
48.65	2.30	0.51	4.51	1.02	0.00	1.02
48.70	2.30	0.51	4.51	1.02	0.00	1.02
48.75	2.30	0.51	4.51	1.02	0.00	1.02
48.80	2.30	0.51	4.51	1.02	0.00	1.02
48.85	2.30	0.51	4.51	1.02	0.00	1.02
48.90	2.30	0.51	4.52	1.02	0.00	1.02
48.95	2.30	0.51	4.52	1.02	0.00	1.02
49.00	2.30	0.51	4.52	1.02	0.00	1.02
49.05	2.30	0.51	4.52	1.02	0.00	1.02
49.10	2.30	0.51	4.52	1.02	0.00	1.02
49.15	2.30	0.51	4.53	1.02	0.00	1.02
49.20	2.30	0.51	4.53	1.02	0.00	1.02
49.25	2.30	0.51	4.53	1.02	0.00	1.02
49.30	2.30	0.51	4.53	1.02	0.00	1.02
49.35	2.30	0.51	4.54	1.02	0.00	1.02
49.40	2.30	0.51	4.54	1.02	0.00	1.02
49.45	2.30	0.51	4.54	1.02	0.00	1.02
49.50	2.30	0.51	4.54	1.02	0.00	1.02
49.55	2.30	0.51	4.55	1.02	0.00	1.02
49.60	2.30	0.51	4.55	1.02	0.00	1.02
49.65	2.30	0.51	4.55	1.02	0.00	1.02
49.70	2.30	0.51	4.55	1.02	0.00	1.02
49.75	2.30	0.51	4.55	1.02	0.00	1.02
49.80	2.30	0.50	4.56	1.02	0.00	1.02
49.85	2.30	0.50	4.56	1.02	0.00	1.02
49.90	2.30	0.50	4.56	1.02	0.00	1.02
49.95	2.30	0.50	4.56	1.02	0.00	1.02
50.00	2.30	0.50	4.57	1.02	0.00	1.02
50.05	2.30	0.50	4.57	1.02	0.00	1.02
50.10	2.30	0.50	4.57	1.02	0.00	1.02
50.15	2.30	0.50	4.57	1.02	0.00	1.02
50.20	2.30	0.50	4.57	1.02	0.00	1.02
50.25	2.30	0.50	4.58	1.02	0.00	1.02
50.30	2.30	0.50	4.58	1.02	0.00	1.02
50.35	2.30	0.50	4.58	1.02	0.00	1.02
50.40	2.30	0.50	4.58	1.02	0.00	1.02
50.45	2.30	0.50	4.59	1.02	0.00	1.02
50.50	2.30	0.50	4.59	1.02	0.00	1.02
50.55	2.30	0.50	4.59	1.02	0.00	1.02

50.60	2.30	0.50	4.59	1.02	0.00	1.02
50.65	2.30	0.50	4.60	1.02	0.00	1.02
50.70	2.30	0.50	4.60	1.02	0.00	1.02
50.75	2.30	0.50	4.60	1.02	0.00	1.02
50.80	2.30	0.50	4.60	1.02	0.00	1.02
50.85	2.30	0.50	4.60	1.02	0.00	1.02
50.90	2.30	0.50	4.61	1.02	0.00	1.02
50.95	2.30	0.50	4.61	1.02	0.00	1.02
51.00	2.30	0.50	4.61	1.02	0.00	1.02
51.05	2.30	0.50	4.61	1.02	0.00	1.02
51.10	2.30	0.50	4.62	1.02	0.00	1.02
51.15	2.30	0.50	4.62	1.02	0.00	1.02
51.20	2.30	0.50	4.62	1.02	0.00	1.02
51.25	2.30	0.50	4.62	1.02	0.00	1.02
51.30	2.30	0.50	4.63	1.02	0.00	1.02
51.35	2.31	0.50	4.66	1.02	0.00	1.02
51.40	2.31	0.50	4.66	1.02	0.00	1.02
51.45	2.31	0.50	4.66	1.02	0.00	1.02
51.50	2.31	0.50	4.66	1.02	0.00	1.02
51.55	2.31	0.50	4.66	1.02	0.00	1.02
51.60	2.31	0.50	4.66	1.02	0.00	1.02
51.65	2.31	0.50	4.67	1.02	0.00	1.02
51.70	2.31	0.50	4.67	1.02	0.00	1.02
51.75	2.31	0.50	4.67	1.02	0.00	1.02
51.80	2.31	0.49	4.67	1.02	0.00	1.02
51.85	2.31	0.49	4.67	1.02	0.00	1.02
51.90	2.31	0.49	4.67	1.02	0.00	1.02
51.95	2.31	0.49	4.68	1.02	0.00	1.02
52.00	2.31	0.49	4.68	1.02	0.00	1.02
52.05	2.31	0.49	4.68	1.02	0.00	1.02
52.10	2.31	0.49	4.68	1.02	0.00	1.02
52.15	2.31	0.49	4.68	1.02	0.00	1.02
52.20	2.31	0.49	4.68	1.02	0.00	1.02
52.25	2.31	0.49	4.69	1.02	0.00	1.02
52.30	2.31	0.49	4.69	1.02	0.00	1.02
52.35	2.31	0.49	4.69	1.02	0.00	1.02
52.40	2.31	0.49	4.69	1.02	0.00	1.02
52.45	2.31	0.49	4.69	1.02	0.00	1.02
52.50	2.31	0.49	4.70	1.02	0.00	1.02
52.55	2.31	0.49	4.70	1.02	0.00	1.02
52.60	2.31	0.49	4.70	1.02	0.00	1.02
52.65	2.31	0.49	4.70	1.02	0.00	1.02
52.70	2.31	0.49	4.70	1.02	0.00	1.02
52.75	2.30	0.49	4.70	1.02	0.00	1.02
52.80	2.30	0.49	4.71	1.02	0.00	1.02
52.85	2.30	0.49	4.71	1.02	0.00	1.02
52.90	2.30	0.49	4.71	1.02	0.00	1.02
52.95	2.30	0.49	4.71	1.02	0.00	1.02
53.00	2.30	0.49	4.71	1.02	0.00	1.02
53.05	2.30	0.49	4.71	1.02	0.00	1.02
53.10	2.30	0.49	4.72	1.02	0.00	1.02
53.15	2.30	0.49	4.72	1.02	0.00	1.02
53.20	2.30	0.49	4.72	1.02	0.00	1.02
53.25	2.30	0.49	4.72	1.02	0.00	1.02
53.30	2.30	0.49	4.72	1.02	0.00	1.02
53.35	2.30	0.49	4.72	1.02	0.00	1.02
53.40	2.30	0.49	4.73	1.02	0.00	1.02
53.45	2.30	0.49	4.73	1.02	0.00	1.02
53.50	2.30	0.49	4.73	1.02	0.00	1.02
53.55	2.30	0.49	4.73	1.02	0.00	1.02
53.60	2.30	0.49	4.73	1.02	0.00	1.02
53.65	2.30	0.49	4.74	1.02	0.00	1.02
53.70	2.30	0.49	4.74	1.02	0.00	1.02
53.75	2.30	0.48	4.74	1.02	0.00	1.02
53.80	2.30	0.48	4.74	1.02	0.00	1.02
53.85	2.30	0.48	4.74	1.02	0.00	1.02
53.90	2.30	0.48	4.74	1.02	0.00	1.02
53.95	2.30	0.48	4.75	1.02	0.00	1.02
54.00	2.30	0.48	4.75	1.02	0.00	1.02

54.05	2.30	0.48	4.75	1.02	0.00	1.02
54.10	2.30	0.48	4.75	1.02	0.00	1.02
54.15	2.30	0.48	4.75	1.02	0.00	1.02
54.20	2.30	0.48	4.76	1.02	0.00	1.02
54.25	2.29	0.48	4.76	1.02	0.00	1.02
54.30	2.29	0.48	4.76	1.02	0.00	1.02
54.35	2.29	0.48	4.76	1.02	0.00	1.02
54.40	2.29	0.48	4.76	1.02	0.00	1.02
54.45	2.29	0.48	4.76	1.02	0.00	1.02
54.50	2.29	0.48	4.77	1.02	0.00	1.02
54.55	2.29	0.48	4.77	1.02	0.00	1.02
54.60	2.29	0.48	4.77	1.02	0.00	1.02
54.65	2.29	0.48	4.77	1.02	0.00	1.02
54.70	2.29	0.48	4.77	1.02	0.00	1.02
54.75	2.29	0.48	4.78	1.02	0.00	1.02
54.80	2.29	0.48	4.78	1.02	0.00	1.02
54.85	2.29	0.48	4.78	1.02	0.00	1.02
54.90	2.29	0.48	4.78	1.02	0.00	1.02
54.95	2.29	0.48	4.78	1.02	0.00	1.02
55.00	2.29	0.48	4.78	1.02	0.00	1.02
55.05	2.29	0.48	4.79	1.02	0.00	1.02
55.10	2.29	0.48	4.79	1.02	0.00	1.02
55.15	2.29	0.48	4.79	1.02	0.00	1.02
55.20	2.29	0.48	4.79	1.02	0.00	1.02
55.25	2.29	0.48	4.79	1.02	0.00	1.02
55.30	2.29	0.48	4.80	1.02	0.00	1.02
55.35	2.29	0.48	4.80	1.02	0.00	1.02
55.40	2.29	0.48	4.80	1.02	0.00	1.02
55.45	2.29	0.48	4.80	1.02	0.00	1.02
55.50	2.29	0.48	4.80	1.02	0.00	1.02
55.55	2.29	0.48	4.80	1.02	0.00	1.02
55.60	2.29	0.48	4.81	1.02	0.00	1.02
55.65	2.29	0.48	4.81	1.02	0.00	1.02
55.70	2.28	0.47	4.81	1.02	0.00	1.02
55.75	2.28	0.47	4.81	1.02	0.00	1.02
55.80	2.28	0.47	4.81	1.02	0.00	1.02
55.85	2.28	0.47	4.82	1.02	0.00	1.02
55.90	2.28	0.47	4.82	1.02	0.00	1.02
55.95	2.28	0.47	4.82	1.02	0.00	1.02
56.00	2.28	0.47	4.82	1.02	0.00	1.02
56.05	2.28	0.47	4.82	1.02	0.00	1.02
56.10	2.28	0.47	4.83	1.02	0.00	1.02
56.15	2.28	0.47	4.83	1.02	0.00	1.02
56.20	2.28	0.47	4.83	1.02	0.00	1.02
56.25	2.28	0.47	4.83	1.02	0.00	1.02
56.30	2.28	0.47	4.83	1.02	0.00	1.02
56.35	2.28	0.47	4.84	1.02	0.00	1.02
56.40	2.28	0.47	4.84	1.02	0.00	1.02
56.45	2.28	0.47	4.84	1.02	0.00	1.02
56.50	2.28	0.47	4.84	1.02	0.00	1.02
56.55	2.28	0.47	4.84	1.02	0.00	1.02
56.60	2.28	0.47	4.84	1.02	0.00	1.02
56.65	2.28	0.47	4.85	1.02	0.00	1.02
56.70	2.28	0.47	4.85	1.02	0.00	1.02
56.75	2.28	0.47	4.85	1.02	0.00	1.02
56.80	2.28	0.47	4.85	1.02	0.00	1.02
56.85	2.28	0.47	4.85	1.02	0.00	1.02
56.90	2.28	0.47	4.86	1.02	0.00	1.02
56.95	2.28	0.47	4.86	1.02	0.00	1.02
57.00	2.28	0.47	4.86	1.02	0.00	1.02
57.05	2.28	0.47	4.86	1.02	0.00	1.02
57.10	2.28	0.47	4.86	1.02	0.00	1.02
57.15	2.28	0.47	4.87	1.02	0.00	1.02
57.20	2.27	0.47	4.87	1.02	0.00	1.02
57.25	2.27	0.47	4.87	1.02	0.00	1.02
57.30	2.27	0.47	4.87	1.02	0.00	1.02
57.35	2.27	0.47	4.87	1.02	0.00	1.02
57.40	2.27	0.47	4.88	1.02	0.00	1.02
57.45	2.27	0.47	4.88	1.02	0.00	1.02

57.50	2.27	0.47	4.88	1.02	0.00	1.02
57.55	2.27	0.47	4.88	1.02	0.00	1.02
57.60	2.27	0.47	4.88	1.02	0.00	1.02
57.65	2.27	0.46	4.89	1.02	0.00	1.02
57.70	2.27	0.46	4.89	1.02	0.00	1.02
57.75	2.27	0.46	4.89	1.02	0.00	1.02
57.80	2.27	0.46	4.89	1.02	0.00	1.02
57.85	2.27	0.46	4.89	1.02	0.00	1.02
57.90	2.27	0.46	4.90	1.02	0.00	1.02
57.95	2.27	0.46	4.90	1.02	0.00	1.02
58.00	2.27	0.46	4.90	1.02	0.00	1.02
58.05	2.27	0.46	4.90	1.02	0.00	1.02
58.10	2.27	0.46	4.90	1.02	0.00	1.02
58.15	2.27	0.46	4.91	1.02	0.00	1.02
58.20	2.27	0.46	4.91	1.02	0.00	1.02
58.25	2.27	0.46	4.91	1.02	0.00	1.02
58.30	2.27	0.46	4.91	1.02	0.00	1.02
58.35	2.27	0.46	4.91	1.02	0.00	1.02
58.40	2.27	0.46	4.92	1.02	0.00	1.02
58.45	2.27	0.46	4.92	1.02	0.00	1.02
58.50	2.27	0.46	4.92	1.02	0.00	1.02
58.55	2.27	0.46	4.92	1.02	0.00	1.02
58.60	2.27	0.46	4.92	1.02	0.00	1.02
58.65	2.27	0.46	4.93	1.02	0.00	1.02
58.70	2.27	0.46	4.93	1.02	0.00	1.02
58.75	2.26	0.46	4.93	1.02	0.00	1.02
58.80	2.26	0.46	4.93	1.02	0.00	1.02
58.85	2.26	0.46	4.93	1.02	0.00	1.02
58.90	2.26	0.46	4.94	1.02	0.00	1.02
58.95	2.26	0.46	4.94	1.02	0.00	1.02
59.00	2.26	0.46	4.94	1.02	0.00	1.02
59.05	2.26	0.46	4.94	1.02	0.00	1.02
59.10	2.26	0.46	4.94	1.02	0.00	1.02
59.15	2.26	0.46	4.95	1.02	0.00	1.02
59.20	2.26	0.46	4.95	1.02	0.00	1.02
59.25	2.26	0.46	4.95	1.02	0.00	1.02
59.30	2.26	0.46	4.95	1.02	0.00	1.02
59.35	2.26	0.46	4.96	1.02	0.00	1.02
59.40	2.26	0.46	4.96	1.02	0.00	1.02
59.45	2.26	0.46	4.96	1.02	0.00	1.02
59.50	2.26	0.46	4.96	1.02	0.00	1.02
59.55	2.26	0.46	4.96	1.02	0.00	1.02
59.60	2.26	0.45	4.97	1.02	0.00	1.02
59.65	2.26	0.45	4.97	1.02	0.00	1.02
59.70	2.26	0.45	4.97	1.02	0.00	1.02
59.75	2.26	0.45	4.97	1.02	0.00	1.02
59.80	2.26	0.45	4.97	1.02	0.00	1.02
59.85	2.26	0.45	4.98	1.02	0.00	1.02
59.90	2.26	0.45	4.98	1.02	0.00	1.02
59.95	2.26	0.45	4.98	1.02	0.00	1.02
60.00	2.26	0.45	4.98	1.02	0.00	1.02
60.05	2.26	0.45	4.98	1.02	0.00	1.02
60.10	2.26	0.45	4.99	1.02	0.00	1.02
60.15	2.26	0.45	4.99	1.02	0.00	1.02
60.20	2.26	0.45	4.99	1.02	0.00	1.02
60.25	2.25	0.45	4.99	1.02	0.00	1.02
60.30	2.25	0.45	5.00	1.02	0.00	1.02
60.35	2.25	0.45	5.00	1.02	0.00	1.02
60.40	2.25	0.45	5.00	1.02	0.00	1.02
60.45	2.25	0.45	5.00	1.02	0.00	1.02
60.50	2.25	0.45	5.00	1.02	0.00	1.02
60.55	2.25	0.45	5.00	1.02	0.00	1.02
60.60	2.25	0.45	5.00	1.02	0.00	1.02
60.65	2.25	0.45	5.00	1.02	0.00	1.02
60.70	2.25	0.45	5.00	1.02	0.00	1.02
60.75	2.25	0.45	5.00	1.02	0.00	1.02
60.80	2.25	0.45	5.00	1.02	0.00	1.02
60.85	2.25	0.45	5.00	1.02	0.00	1.02
60.90	2.25	0.45	5.00	1.02	0.00	1.02
60.95	2.25	0.45	5.00	1.02	0.00	1.02
61.00	2.25	0.45	5.00	1.02	0.00	1.02
61.05	2.25	0.45	5.00	1.02	0.00	1.02
61.10	2.25	0.45	5.00	1.02	0.00	1.02
61.15	2.25	0.45	5.00	1.02	0.00	1.02
61.20	2.25	0.45	5.00	1.02	0.00	1.02
61.25	2.25	0.45	5.00	1.02	0.00	1.02
61.30	2.25	0.45	5.00	1.02	0.00	1.02
61.35	2.25	0.45	5.00	1.02	0.00	1.02
61.40	2.25	0.45	5.00	1.02	0.00	1.02
61.45	2.25	0.45	5.00	1.02	0.00	1.02
61.50	2.25	0.45	5.00	1.02	0.00	1.02
61.55	2.25	0.44	5.00	1.02	0.00	1.02
61.60	2.25	0.44	5.00	1.02	0.00	1.02
61.65	2.25	0.44	5.00	1.02	0.00	1.02
61.70	2.25	0.44	5.00	1.02	0.00	1.02
61.75	2.25	0.44	5.00	1.02	0.00	1.02
61.80	2.24	0.44	5.00	1.02	0.00	1.02
61.85	2.24	0.44	5.00	1.02	0.00	1.02
61.90	2.24	0.44	5.00	1.02	0.00	1.02
61.95	2.24	0.44	5.00	1.02	0.00	1.02
62.00	2.24	0.44	5.00	1.02	0.00	1.02
62.05	2.24	0.44	5.00	1.02	0.00	1.02
62.10	2.24	0.44	5.00	1.02	0.00	1.02
62.15	2.24	0.44	5.00	1.02	0.00	1.02
62.20	2.24	0.44	5.00	1.02	0.00	1.02
62.25	2.24	0.44	5.00	1.02	0.00	1.02
62.30	2.24	0.44	5.00	1.02	0.00	1.02
62.35	2.24	0.44	5.00	1.02	0.00	1.02
62.40	2.24	0.44	5.00	1.02	0.00	1.02
62.45	2.24	0.44	5.00	1.02	0.00	1.02
62.50	2.24	0.44	5.00	1.02	0.00	1.02
62.55	2.24	0.44	5.00	1.02	0.00	1.02
62.60	2.24	0.44	5.00	1.02	0.00	1.02
62.65	2.24	0.44	5.00	1.02	0.00	1.02
62.70	2.24	0.44	5.00	1.02	0.00	1.02
62.75	2.24	0.44	5.00	1.02	0.00	1.02
62.80	2.24	0.44	5.00	1.02	0.00	1.02
62.85	2.24	0.44	5.00	1.02	0.00	1.02
62.90	2.24	0.44	5.00	1.02	0.00	1.02
62.95	2.24	0.44	5.00	1.02	0.00	1.02
63.00	2.24	0.44	5.00	1.02	0.00	1.02
63.05	2.24	0.44	5.00	1.02	0.00	1.02
63.10	2.24	0.44	5.00	1.02	0.00	1.02
63.15	2.24	0.44	5.00	1.02	0.00	1.02
63.20	2.24	0.44	5.00	1.02	0.00	1.02
63.25	2.24	0.44	5.00	1.02	0.00	1.02
63.30	2.24	0.44	5.00	1.02	0.00	1.02
63.35	2.24	0.44	5.00	1.02	0.00	1.02
63.40	2.24	0.44	5.00	1.02	0.00	1.02
63.45	2.24	0.44	5.00	1.02	0.00	1.02
63.50	2.23	0.44	5.00	1.02	0.00	1.02
63.55	2.23	0.43	5.00	1.02	0.00	1.02
63.60	2.23	0.43	5.00	1.02	0.00	1.02
63.65	2.23	0.43	5.00	1.02	0.00	1.02
63.70	2.23	0.43	5.00	1.02	0.00	1.02
63.75	2.23	0.43	5.00	1.02	0.00	1.02
63.80	2.23	0.43	5.00	1.02	0.00	1.02
63.85	2.23	0.43	5.00	1.02	0.00	1.02
63.90	2.23	0.43	5.00	1.02	0.00	1.02
63.95	2.23	0.43	5.00	1.02	0.00	1.02
64.00	2.23	0.43	5.00	1.02	0.00	1.02
64.05	2.23	0.43	5.00	1.02	0.00	1.02
64.10	2.23	0.43	5.00	1.02	0.00	1.02
64.15	0.54	0.43	1.24	1.02	0.00	1.02
64.20	0.52	0.43	1.20	1.02	0.00	1.02
64.25	0.51	0.43	1.17	1.02	0.00	1.02
64.30	0.49	0.43	1.15	1.02	0.00	1.02
64.35	0.49	0.43	1.13	1.01	0.00	1.01

64.40	0.48	0.43	1.11	1.01	0.00	1.01
64.45	0.47	0.43	1.09	1.01	0.00	1.01
64.50	0.46	0.43	1.08	1.01	0.00	1.01
64.55	0.46	0.43	1.07	1.01	0.00	1.01
64.60	0.45	0.43	1.06	1.00	0.00	1.00
64.65	0.45	0.43	1.05	1.00	0.00	1.00
64.70	0.45	0.43	1.04	1.00	0.00	1.00
64.75	0.44	0.43	1.03	1.00	0.00	1.00
64.80	0.44	0.43	1.02	0.99	0.00	0.99
64.85	0.44	0.43	1.01	0.99	0.00	0.99
64.90	0.43	0.43	1.01	0.99	0.00	0.99
64.95	0.43	0.43	1.00	0.99	0.00	0.99
65.00	0.43	0.43	1.00*	0.98	0.00	0.98
65.05	0.42	0.43	0.99*	0.98	0.00	0.98
65.10	0.42	0.43	0.98*	0.98	0.00	0.98
65.15	0.41	0.43	0.97*	0.97	0.00	0.97
65.20	0.41	0.43	0.96*	0.97	0.00	0.97
65.25	0.41	0.43	0.96*	0.97	0.00	0.97
65.30	0.41	0.43	0.95*	0.96	0.00	0.96
65.35	0.40	0.43	0.94*	0.96	0.00	0.96
65.40	0.40	0.43	0.94*	0.96	0.00	0.96
65.45	0.40	0.43	0.93*	0.95	0.00	0.95
65.50	0.39	0.43	0.93*	0.95	0.00	0.95
65.55	0.39	0.43	0.92*	0.94	0.00	0.94
65.60	0.39	0.43	0.91*	0.94	0.00	0.94
65.65	0.39	0.43	0.91*	0.94	0.00	0.94
65.70	0.38	0.42	0.90*	0.93	0.00	0.93
65.75	0.38	0.42	0.90*	0.93	0.00	0.93
65.80	0.38	0.42	0.89*	0.92	0.00	0.92
65.85	0.38	0.42	0.89*	0.92	0.00	0.92
65.90	0.38	0.42	0.89*	0.91	0.00	0.91
65.95	0.37	0.42	0.88*	0.91	0.00	0.91
66.00	0.37	0.42	0.88*	0.90	0.00	0.90
66.05	0.37	0.42	0.87*	0.90	0.00	0.90
66.10	0.37	0.42	0.87*	0.89	0.00	0.89
66.15	0.36	0.42	0.86*	0.89	0.00	0.89
66.20	0.36	0.42	0.86*	0.88	0.00	0.88
66.25	0.36	0.42	0.85*	0.88	0.00	0.88
66.30	0.36	0.42	0.85*	0.87	0.00	0.87
66.35	0.36	0.42	0.85*	0.87	0.00	0.87
66.40	0.36	0.42	0.84*	0.86	0.00	0.86
66.45	0.35	0.42	0.84*	0.86	0.00	0.86
66.50	0.35	0.42	0.84*	0.85	0.00	0.85
66.55	0.35	0.42	0.83*	0.85	0.00	0.85
66.60	0.35	0.42	0.83*	0.84	0.00	0.84
66.65	0.35	0.42	0.82*	0.83	0.00	0.83
66.70	0.34	0.42	0.82*	0.83	0.00	0.83
66.75	0.34	0.42	0.82*	0.82	0.00	0.82
66.80	0.34	0.42	0.81*	0.82	0.00	0.82
66.85	0.34	0.42	0.81*	0.81	0.00	0.81
66.90	0.34	0.42	0.81*	0.80	0.00	0.80
66.95	0.34	0.42	0.80*	0.80	0.00	0.80
67.00	0.33	0.42	0.80*	0.79	0.00	0.79
67.05	0.33	0.42	0.80*	0.78	0.00	0.78
67.10	0.33	0.42	0.79*	0.78	0.00	0.78
67.15	0.33	0.42	0.79*	0.77	0.00	0.77
67.20	0.33	0.42	0.79*	0.76	0.00	0.76
67.25	0.33	0.42	0.78*	0.76	0.00	0.76
67.30	0.33	0.42	0.78*	0.75	0.00	0.75
67.35	0.32	0.42	0.78*	0.74	0.00	0.74
67.40	0.32	0.42	0.77*	0.74	0.00	0.74
67.45	0.32	0.42	0.77*	0.73	0.00	0.73
67.50	0.32	0.42	0.77*	0.72	0.00	0.72
67.55	0.32	0.42	0.76*	0.71	0.00	0.71
67.60	0.32	0.42	0.76*	0.71	0.00	0.71
67.65	0.32	0.42	0.76*	0.70	0.00	0.70
67.70	0.31	0.42	0.76*	0.69	0.00	0.69
67.75	0.31	0.42	0.75*	0.68	0.00	0.68
67.80	0.31	0.41	0.75*	0.68	0.00	0.68
67.85	0.31	0.41	0.75*	0.67	0.00	0.67
67.90	0.31	0.41	0.74*	0.66	0.00	0.66
67.95	0.31	0.41	0.74*	0.65	0.00	0.65
68.00	0.31	0.41	0.74*	0.64	0.00	0.64
68.05	0.31	0.41	0.74*	0.63	0.00	0.63
68.10	0.30	0.41	0.74*	0.63	0.00	0.63
68.15	0.30	0.41	0.74*	0.62	0.00	0.62
68.20	0.30	0.41	0.74*	0.61	0.00	0.61
68.25	0.30	0.41	0.73*	0.60	0.00	0.60
68.30	0.30	0.41	0.73*	0.59	0.00	0.59
68.35	0.30	0.41	0.73*	0.58	0.00	0.58
68.40	0.30	0.41	0.73*	0.57	0.00	0.57
68.45	0.30	0.41	0.73*	0.57	0.00	0.57
68.50	0.30	0.41	0.73*	0.56	0.00	0.56
68.55	0.30	0.41	0.73*	0.55	0.00	0.55
68.60	0.30	0.41	0.73*	0.54	0.00	0.54
68.65	0.30	0.41	0.73*	0.53	0.00	0.53
68.70	0.30	0.41	0.73*	0.52	0.00	0.52
68.75	0.30	0.41	0.73*	0.51	0.00	0.51
68.80	0.30	0.41	0.72*	0.50	0.00	0.50
68.85	0.30	0.41	0.72*	0.50	0.00	0.50
68.90	0.30	0.41	0.72*	0.49	0.00	0.49
68.95	0.30	0.41	0.72*	0.48	0.00	0.48
69.00	0.30	0.41	0.72*	0.47	0.00	0.47
69.05	0.29	0.41	0.72*	0.46	0.00	0.46
69.10	0.29	0.41	0.72*	0.45	0.00	0.45
69.15	0.29	0.41	0.72*	0.44	0.00	0.44
69.20	0.29	0.41	0.72*	0.43	0.00	0.43
69.25	0.29	0.41	0.72*	0.42	0.00	0.42
69.30	0.29	0.41	0.72*	0.41	0.00	0.41
69.35	0.29	0.41	0.71*	0.40	0.00	0.40
69.40	0.29	0.41	0.71*	0.39	0.00	0.39
69.45	0.29	0.41	0.71*	0.38	0.00	0.38
69.50	0.29	0.41	0.71*	0.38	0.00	0.38
69.55	0.29	0.41	0.71*	0.37	0.00	0.37
69.60	0.29	0.41	0.71*	0.36	0.00	0.36
69.65	0.29	0.41	0.71*	0.35	0.00	0.35
69.70	0.29	0.41	0.71*	0.34	0.00	0.34
69.75	0.29	0.41	0.71*	0.33	0.00	0.33
69.80	0.29	0.41	0.71*	0.32	0.00	0.32
69.85	0.29	0.41	0.71*	0.31	0.00	0.31
69.90	0.29	0.40	0.71*	0.30	0.00	0.30
69.95	0.29	0.40	0.70*	0.29	0.00	0.29
70.00	0.28	0.40	0.70*	0.28	0.00	0.28
70.05	0.28	0.40	0.70*	0.27	0.00	0.27
70.10	0.28	0.40	0.70*	0.26	0.00	0.26
70.15	0.28	0.40	0.70*	0.25	0.00	0.25
70.20	0.28	0.40	0.70*	0.24	0.00	0.24
70.25	0.28	0.40	0.70*	0.23	0.00	0.23
70.30	0.28	0.40	0.70*	0.22	0.00	0.22
70.35	0.28	0.40	0.70*	0.21	0.00	0.21
70.40	0.28	0.40	0.70*	0.20	0.00	0.20
70.45	0.28	0.40	0.70*	0.19	0.00	0.19
70.50	0.28	0.40	0.70*	0.18	0.00	0.18
70.55	0.28	0.40	0.70*	0.17	0.00	0.17
70.60	0.28	0.40	0.69*	0.16	0.00	0.16
70.65	0.28	0.40	0.69*	0.15	0.00	0.15
70.70	0.28	0.40	0.69*	0.14	0.00	0.14
70.75	0.28	0.40	0.69*	0.13	0.00	0.13
70.80	0.28	0.40	0.69*	0.12	0.00	0.12
70.85	0.28	0.40	0.69*	0.11	0.00	0.11
70.90	0.28	0.40	0.69*	0.09	0.00	0.09
70.95	0.28	0.40	0.69*	0.08	0.00	0.08
71.00	0.28	0.40	0.69*	0.07	0.00	0.07
71.05	0.28	0.40	0.71*	0.06	0.00	0.06
71.10	0.29	0.40	0.74*	0.05	0.00	0.05
71.15	0.30	0.40	0.76*	0.04	0.00	0.04
71.20	0.31	0.40	0.79*	0.04	0.00	0.04
71.25	0.33	0.40	0.82*	0.03	0.00	0.03

71.30	0.34	0.40	0.85*	0.02	0.00	0.02
71.35	0.35	0.40	0.89*	0.02	0.00	0.02
71.40	0.37	0.40	0.93*	0.01	0.00	0.01
71.45	0.39	0.40	0.97*	0.01	0.00	0.01
71.50	0.41	0.40	1.03	0.00	0.00	0.00
71.55	0.44	0.40	1.11	0.00	0.00	0.00
71.60	2.19	0.40	5.00	0.00	0.00	0.00
71.65	2.19	0.40	5.00	0.00	0.00	0.00
71.70	2.19	0.40	5.00	0.00	0.00	0.00
71.75	2.19	0.40	5.00	0.00	0.00	0.00
71.80	2.19	0.40	5.00	0.00	0.00	0.00
71.85	2.19	0.40	5.00	0.00	0.00	0.00
71.90	2.19	0.40	5.00	0.00	0.00	0.00
71.95	2.19	0.39	5.00	0.00	0.00	0.00
72.00	2.19	0.39	5.00	0.00	0.00	0.00
72.05	2.19	0.39	5.00	0.00	0.00	0.00
72.10	2.19	0.39	5.00	0.00	0.00	0.00
72.15	2.19	0.39	5.00	0.00	0.00	0.00
72.20	2.19	0.39	5.00	0.00	0.00	0.00
72.25	2.19	0.39	5.00	0.00	0.00	0.00
72.30	2.19	0.39	5.00	0.00	0.00	0.00
72.35	2.19	0.39	5.00	0.00	0.00	0.00
72.40	2.19	0.39	5.00	0.00	0.00	0.00
72.45	2.19	0.39	5.00	0.00	0.00	0.00
72.50	2.19	0.39	5.00	0.00	0.00	0.00
72.55	2.19	0.39	5.00	0.00	0.00	0.00
72.60	2.19	0.39	5.00	0.00	0.00	0.00
72.65	2.19	0.39	5.00	0.00	0.00	0.00
72.70	2.19	0.39	5.00	0.00	0.00	0.00
72.75	2.19	0.39	5.00	0.00	0.00	0.00
72.80	2.19	0.39	5.00	0.00	0.00	0.00
72.85	2.19	0.39	5.00	0.00	0.00	0.00
72.90	2.19	0.39	5.00	0.00	0.00	0.00
72.95	2.19	0.39	5.00	0.00	0.00	0.00
73.00	2.19	0.39	5.00	0.00	0.00	0.00
73.05	2.19	0.39	5.00	0.00	0.00	0.00
73.10	2.19	0.39	5.00	0.00	0.00	0.00
73.15	2.19	0.39	5.00	0.00	0.00	0.00
73.20	2.18	0.39	5.00	0.00	0.00	0.00
73.25	2.18	0.39	5.00	0.00	0.00	0.00
73.30	2.18	0.39	5.00	0.00	0.00	0.00
73.35	2.18	0.39	5.00	0.00	0.00	0.00
73.40	2.18	0.39	5.00	0.00	0.00	0.00
73.45	2.18	0.39	5.00	0.00	0.00	0.00
73.50	2.18	0.39	5.00	0.00	0.00	0.00
73.55	2.18	0.39	5.00	0.00	0.00	0.00
73.60	2.18	0.39	5.00	0.00	0.00	0.00
73.65	2.18	0.39	5.00	0.00	0.00	0.00
73.70	2.18	0.39	5.00	0.00	0.00	0.00
73.75	2.18	0.39	5.00	0.00	0.00	0.00
73.80	2.18	0.39	5.00	0.00	0.00	0.00
73.85	2.18	0.39	5.00	0.00	0.00	0.00
73.90	2.18	0.39	5.00	0.00	0.00	0.00
73.95	2.18	0.39	5.00	0.00	0.00	0.00
74.00	2.18	0.38	5.00	0.00	0.00	0.00
74.05	2.18	0.38	5.00	0.00	0.00	0.00
74.10	2.18	0.38	5.00	0.00	0.00	0.00
74.15	2.18	0.38	5.00	0.00	0.00	0.00
74.20	2.18	0.38	5.00	0.00	0.00	0.00
74.25	2.18	0.38	5.00	0.00	0.00	0.00
74.30	2.18	0.38	5.00	0.00	0.00	0.00
74.35	2.18	0.38	5.00	0.00	0.00	0.00
74.40	2.18	0.38	5.00	0.00	0.00	0.00
74.45	2.18	0.38	5.00	0.00	0.00	0.00
74.50	2.18	0.38	5.00	0.00	0.00	0.00
74.55	2.18	0.38	5.00	0.00	0.00	0.00
74.60	2.18	0.38	5.00	0.00	0.00	0.00
74.65	2.18	0.38	5.00	0.00	0.00	0.00
74.70	2.18	0.38	5.00	0.00	0.00	0.00
74.75	2.18	0.38	5.00	0.00	0.00	0.00
74.80	2.18	0.38	5.00	0.00	0.00	0.00
74.85	2.18	0.38	5.00	0.00	0.00	0.00
74.90	2.18	0.38	5.00	0.00	0.00	0.00
74.95	2.18	0.38	5.00	0.00	0.00	0.00
75.00	2.18	0.38	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Depth = ft, Stress or Pressure = tsf (atm), Unit Weight = pcf, Settlement = in.

CRRm	Cyclic resistance ratio from soils
CSRfs	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRfs
S_sat	Settlement from saturated sands
S_dry	Settlement from dry sands
S_all	Total settlement from saturated and dry sands
NoLiq	No-Liquefy Soils

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Input File Name: E:\VB&B\Woodfin\Boring 3.liq
Title: Woodfin Suites
Subtitle: B-3

Surface Elev.=9
Hole No.=B-3
Depth of Hole= 50.0 ft
Water Table during Earthquake= 4.0 ft
Water Table during In-Situ Testing= 8.0 ft
Max. Acceleration= 0.5 g
Earthquake Magnitude= 7.1

Input Data:

Surface Elev.=9
Hole No.=B-3
Depth of Hole=50.0 ft
Water Table during Earthquake= 4.0 ft
Water Table during In-Situ Testing= 8.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=7.1

Earthquake Magnitude=7.1
2. Settlement Analysis Method: Ishihara / Yoshimine*
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1
7. Borehole Diameter, Cb= 1.15
8. Sampeling Method, Cs= 1
9. User request factor of safty (apply to CSR) , User= 1.2
Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.0	10.0	100.0	NoLiq
2.0	10.0	100.0	NoLiq
5.0	4.0	100.0	NoLiq
8.0	4.0	100.0	NoLiq
9.0	3.0	110.0	16.0
11.0	3.0	110.0	16.0
15.0	13.0	110.0	16.0
17.0	4.0	110.0	16.0
19.0	40.0	110.0	7.0
21.0	32.0	110.0	3.0
23.0	32.0	110.0	NoLiq
24.0	32.0	110.0	NoLiq
27.0	3.0	110.0	22.0
29.0	3.0	110.0	22.0
34.0	7.0	110.0	56.0
39.0	76.0	120.0	10.0
40.0	76.0	120.0	10.0
44.0	59.0	120.0	10.0
49.0	76.0	120.0	10.0

Output Results:

Settlement of saturated sands=6.45 in.
Settlement of dry sands=0.00 in.
Total settlement of saturated and dry sands=6.45 in.
Differential Settlement=3.227 to 4.260 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.00	0.32	5.00	6.45	0.00	6.45
0.05	2.00	0.32	5.00	6.45	0.00	6.45
0.10	2.00	0.32	5.00	6.45	0.00	6.45
0.15	2.00	0.32	5.00	6.45	0.00	6.45
0.20	2.00	0.32	5.00	6.45	0.00	6.45
0.25	2.00	0.32	5.00	6.45	0.00	6.45
0.30	2.00	0.32	5.00	6.45	0.00	6.45
0.35	2.00	0.32	5.00	6.45	0.00	6.45
0.40	2.00	0.32	5.00	6.45	0.00	6.45
0.45	2.00	0.32	5.00	6.45	0.00	6.45
0.50	2.00	0.32	5.00	6.45	0.00	6.45
0.55	2.00	0.32	5.00	6.45	0.00	6.45
0.60	2.00	0.32	5.00	6.45	0.00	6.45
0.65	2.00	0.32	5.00	6.45	0.00	6.45
0.70	2.00	0.32	5.00	6.45	0.00	6.45
0.75	2.00	0.32	5.00	6.45	0.00	6.45
0.80	2.00	0.32	5.00	6.45	0.00	6.45
0.85	2.00	0.32	5.00	6.45	0.00	6.45
0.90	2.00	0.32	5.00	6.45	0.00	6.45
0.95	2.00	0.32	5.00	6.45	0.00	6.45
1.00	2.00	0.32	5.00	6.45	0.00	6.45
1.05	2.00	0.32	5.00	6.45	0.00	6.45
1.10	2.00	0.32	5.00	6.45	0.00	6.45
1.15	2.00	0.32	5.00	6.45	0.00	6.45
1.20	2.00	0.32	5.00	6.45	0.00	6.45
1.25	2.00	0.32	5.00	6.45	0.00	6.45
1.30	2.00	0.32	5.00	6.45	0.00	6.45
1.35	2.00	0.32	5.00	6.45	0.00	6.45
1.40	2.00	0.32	5.00	6.45	0.00	6.45
1.45	2.00	0.32	5.00	6.45	0.00	6.45
1.50	2.00	0.32	5.00	6.45	0.00	6.45
1.55	2.00	0.32	5.00	6.45	0.00	6.45
1.60	2.00	0.32	5.00	6.45	0.00	6.45
1.65	2.00	0.32	5.00	6.45	0.00	6.45
1.70	2.00	0.32	5.00	6.45	0.00	6.45
1.75	2.00	0.32	5.00	6.45	0.00	6.45
1.80	2.00	0.32	5.00	6.45	0.00	6.45
1.85	2.00	0.32	5.00	6.45	0.00	6.45
1.90	2.00	0.32	5.00	6.45	0.00	6.45
1.95	2.00	0.32	5.00	6.45	0.00	6.45
2.00	2.00	0.32	5.00	6.45	0.00	6.45
2.05	2.00	0.32	5.00	6.45	0.00	6.45
2.10	2.00	0.32	5.00	6.45	0.00	6.45
2.15	2.00	0.32	5.00	6.45	0.00	6.45
2.20	2.00	0.32	5.00	6.45	0.00	6.45
2.25	2.00	0.32	5.00	6.45	0.00	6.45
2.30	2.00	0.32	5.00	6.45	0.00	6.45
2.35	2.00	0.32	5.00	6.45	0.00	6.45
2.40	2.00	0.32	5.00	6.45	0.00	6.45
2.45	2.00	0.32	5.00	6.45	0.00	6.45
2.50	2.00	0.32	5.00	6.45	0.00	6.45
2.55	2.00	0.32	5.00	6.45	0.00	6.45
2.60	2.00	0.32	5.00	6.45	0.00	6.45
2.65	2.00	0.32	5.00	6.45	0.00	6.45
2.70	2.00	0.32	5.00	6.45	0.00	6.45
2.75	2.00	0.32	5.00	6.45	0.00	6.45

2.80	2.00	0.32	5.00	6.45	0.00	6.45
2.85	2.00	0.32	5.00	6.45	0.00	6.45
2.90	2.00	0.32	5.00	6.45	0.00	6.45
2.95	2.00	0.32	5.00	6.45	0.00	6.45
3.00	2.00	0.32	5.00	6.45	0.00	6.45
3.05	2.00	0.32	5.00	6.45	0.00	6.45
3.10	2.00	0.32	5.00	6.45	0.00	6.45
3.15	2.00	0.32	5.00	6.45	0.00	6.45
3.20	2.00	0.32	5.00	6.45	0.00	6.45
3.25	2.00	0.32	5.00	6.45	0.00	6.45
3.30	2.00	0.32	5.00	6.45	0.00	6.45
3.35	2.00	0.32	5.00	6.45	0.00	6.45
3.40	2.00	0.32	5.00	6.45	0.00	6.45
3.45	2.00	0.32	5.00	6.45	0.00	6.45
3.50	2.00	0.32	5.00	6.45	0.00	6.45
3.55	2.00	0.32	5.00	6.45	0.00	6.45
3.60	2.00	0.32	5.00	6.45	0.00	6.45
3.65	2.00	0.32	5.00	6.45	0.00	6.45
3.70	2.00	0.32	5.00	6.45	0.00	6.45
3.75	2.00	0.32	5.00	6.45	0.00	6.45
3.80	2.00	0.32	5.00	6.45	0.00	6.45
3.85	2.00	0.32	5.00	6.45	0.00	6.45
3.90	2.00	0.32	5.00	6.45	0.00	6.45
3.95	2.00	0.32	5.00	6.45	0.00	6.45
4.00	2.00	0.32	5.00	6.45	0.00	6.45
4.05	2.00	0.32	5.00	6.45	0.00	6.45
4.10	2.00	0.32	5.00	6.45	0.00	6.45
4.15	2.00	0.33	5.00	6.45	0.00	6.45
4.20	2.00	0.33	5.00	6.45	0.00	6.45
4.25	2.00	0.33	5.00	6.45	0.00	6.45
4.30	2.00	0.33	5.00	6.45	0.00	6.45
4.35	2.00	0.34	5.00	6.45	0.00	6.45
4.40	2.00	0.34	5.00	6.45	0.00	6.45
4.45	2.00	0.34	5.00	6.45	0.00	6.45
4.50	2.00	0.34	5.00	6.45	0.00	6.45
4.55	2.00	0.35	5.00	6.45	0.00	6.45
4.60	2.00	0.35	5.00	6.45	0.00	6.45
4.65	2.00	0.35	5.00	6.45	0.00	6.45
4.70	2.00	0.35	5.00	6.45	0.00	6.45
4.75	2.00	0.35	5.00	6.45	0.00	6.45
4.80	2.00	0.36	5.00	6.45	0.00	6.45
4.85	2.00	0.36	5.00	6.45	0.00	6.45
4.90	2.00	0.36	5.00	6.45	0.00	6.45
4.95	2.00	0.36	5.00	6.45	0.00	6.45
5.00	2.00	0.36	5.00	6.45	0.00	6.45
5.05	2.00	0.37	5.00	6.45	0.00	6.45
5.10	2.00	0.37	5.00	6.45	0.00	6.45
5.15	2.00	0.37	5.00	6.45	0.00	6.45
5.20	2.00	0.37	5.00	6.45	0.00	6.45
5.25	2.00	0.37	5.00	6.45	0.00	6.45
5.30	2.00	0.38	5.00	6.45	0.00	6.45
5.35	2.00	0.38	5.00	6.45	0.00	6.45
5.40	2.00	0.38	5.00	6.45	0.00	6.45
5.45	2.00	0.38	5.00	6.45	0.00	6.45
5.50	2.00	0.38	5.00	6.45	0.00	6.45
5.55	2.00	0.39	5.00	6.45	0.00	6.45
5.60	2.00	0.39	5.00	6.45	0.00	6.45
5.65	2.00	0.39	5.00	6.45	0.00	6.45
5.70	2.00	0.39	5.00	6.45	0.00	6.45
5.75	2.00	0.39	5.00	6.45	0.00	6.45
5.80	2.00	0.39	5.00	6.45	0.00	6.45
5.85	2.00	0.40	5.00	6.45	0.00	6.45
5.90	2.00	0.40	5.00	6.45	0.00	6.45
5.95	2.00	0.40	5.00	6.45	0.00	6.45
6.00	2.00	0.40	5.00	6.45	0.00	6.45
6.05	2.00	0.40	5.00	6.45	0.00	6.45
6.10	2.00	0.41	5.00	6.45	0.00	6.45
6.15	2.00	0.41	5.00	6.45	0.00	6.45
6.20	2.00	0.41	5.00	6.45	0.00	6.45
6.25	2.00	0.41	5.00	6.45	0.00	6.45
6.30	2.00	0.41	5.00	6.45	0.00	6.45
6.35	2.00	0.41	5.00	6.45	0.00	6.45
6.40	2.00	0.42	5.00	6.45	0.00	6.45
6.45	2.00	0.42	5.00	6.45	0.00	6.45
6.50	2.00	0.42	5.00	6.45	0.00	6.45
6.55	2.00	0.42	5.00	6.45	0.00	6.45
6.60	2.00	0.42	5.00	6.45	0.00	6.45
6.65	2.00	0.42	5.00	6.45	0.00	6.45
6.70	2.00	0.42	5.00	6.45	0.00	6.45
6.75	2.00	0.43	5.00	6.45	0.00	6.45
6.80	2.00	0.43	5.00	6.45	0.00	6.45
6.85	2.00	0.43	5.00	6.45	0.00	6.45
6.90	2.00	0.43	5.00	6.45	0.00	6.45
6.95	2.00	0.43	5.00	6.45	0.00	6.45
7.00	2.00	0.43	5.00	6.45	0.00	6.45
7.05	2.00	0.44	5.00	6.45	0.00	6.45
7.10	2.00	0.44	5.00	6.45	0.00	6.45
7.15	2.00	0.44	5.00	6.45	0.00	6.45
7.20	2.00	0.44	5.00	6.45	0.00	6.45
7.25	2.00	0.44	5.00	6.45	0.00	6.45
7.30	2.00	0.44	5.00	6.45	0.00	6.45
7.35	2.00	0.44	5.00	6.45	0.00	6.45
7.40	2.00	0.45	5.00	6.45	0.00	6.45
7.45	2.00	0.45	5.00	6.45	0.00	6.45
7.50	2.00	0.45	5.00	6.45	0.00	6.45
7.55	2.00	0.45	5.00	6.45	0.00	6.45
7.60	2.00	0.45	5.00	6.45	0.00	6.45
7.65	2.00	0.45	5.00	6.45	0.00	6.45
7.70	2.00	0.45	5.00	6.45	0.00	6.45
7.75	2.00	0.45	5.00	6.45	0.00	6.45
7.80	2.00	0.46	5.00	6.45	0.00	6.45
7.85	2.00	0.46	5.00	6.45	0.00	6.45
7.90	2.00	0.46	5.00	6.45	0.00	6.45
7.95	2.00	0.46	5.00	6.45	0.00	6.45
8.00	2.00	0.46	5.00	6.45	0.00	6.45
8.05	2.00	0.46	5.00	6.45	0.00	6.45
8.10	2.00	0.46	5.00	6.45	0.00	6.45
8.15	2.00	0.46	5.00	6.45	0.00	6.45
8.20	2.00	0.47	5.00	6.45	0.00	6.45
8.25	2.00	0.47	5.00	6.45	0.00	6.45
8.30	2.00	0.47	5.00	6.45	0.00	6.45
8.35	2.00	0.47	5.00	6.45	0.00	6.45
8.40	2.00	0.47	5.00	6.45	0.00	6.45
8.45	2.00	0.47	5.00	6.45	0.00	6.45
8.50	2.00	0.47	5.00	6.45	0.00	6.45
8.55	2.00	0.47	5.00	6.45	0.00	6.45
8.60	2.00	0.47	5.00	6.45	0.00	6.45
8.65	2.00	0.48	5.00	6.45	0.00	6.45
8.70	2.00	0.48	5.00	6.45	0.00	6.45
8.75	2.00	0.48	5.00	6.45	0.00	6.45
8.80	2.00	0.48	5.00	6.45	0.00	6.45
8.85	2.00	0.48	5.00	6.45	0.00	6.45
8.90	2.00	0.48	5.00	6.45	0.00	6.45
8.95	2.00	0.48	5.00	6.45	0.00	6.45
9.00	0.09	0.48	0.19*	6.45	0.00	6.45
9.05	0.09	0.48	0.19*	6.43	0.00	6.43
9.10	0.09	0.48	0.19*	6.40	0.00	6.40
9.15	0.09	0.49	0.19*	6.38	0.00	6.38
9.20	0.09	0.49	0.19*	6.35	0.00	6.35
9.25	0.09	0.49	0.19*	6.33	0.00	6.33
9.30	0.09	0.49	0.19*	6.30	0.00	6.30
9.35	0.09	0.49	0.19*	6.28	0.00	6.28
9.40	0.09	0.49	0.19*	6.25	0.00	6.25
9.45	0.09	0.49	0.19*	6.23	0.00	6.23
9.50	0.09	0.49	0.19*	6.20	0.00	6.20
9.55	0.09	0.49	0.19*	6.18	0.00	6.18
9.60	0.09	0.49	0.19*	6.15	0.00	6.15
9.65	0.09	0.49	0.19*	6.13	0.00	6.13

9.70	0.09	0.50	0.19*	6.10	0.00	6.10
9.75	0.09	0.50	0.19*	6.07	0.00	6.07
9.80	0.09	0.50	0.19*	6.05	0.00	6.05
9.85	0.09	0.50	0.19*	6.02	0.00	6.02
9.90	0.09	0.50	0.18*	6.00	0.00	6.00
9.95	0.09	0.50	0.18*	5.97	0.00	5.97
10.00	0.09	0.50	0.18*	5.95	0.00	5.95
10.05	0.09	0.50	0.18*	5.92	0.00	5.92
10.10	0.09	0.50	0.18*	5.90	0.00	5.90
10.15	0.09	0.50	0.18*	5.87	0.00	5.87
10.20	0.09	0.50	0.18*	5.85	0.00	5.85
10.25	0.09	0.50	0.18*	5.82	0.00	5.82
10.30	0.09	0.51	0.18*	5.79	0.00	5.79
10.35	0.09	0.51	0.18*	5.77	0.00	5.77
10.40	0.09	0.51	0.18*	5.74	0.00	5.74
10.45	0.09	0.51	0.18*	5.72	0.00	5.72
10.50	0.09	0.51	0.18*	5.69	0.00	5.69
10.55	0.09	0.51	0.18*	5.67	0.00	5.67
10.60	0.09	0.51	0.18*	5.64	0.00	5.64
10.65	0.09	0.51	0.18*	5.62	0.00	5.62
10.70	0.09	0.51	0.18*	5.59	0.00	5.59
10.75	0.09	0.51	0.18*	5.57	0.00	5.57
10.80	0.09	0.51	0.18*	5.54	0.00	5.54
10.85	0.09	0.51	0.18*	5.51	0.00	5.51
10.90	0.09	0.51	0.18*	5.49	0.00	5.49
10.95	0.09	0.51	0.18*	5.46	0.00	5.46
11.00	0.09	0.52	0.18*	5.44	0.00	5.44
11.05	0.09	0.52	0.18*	5.41	0.00	5.41
11.10	0.09	0.52	0.18*	5.39	0.00	5.39
11.15	0.10	0.52	0.19*	5.36	0.00	5.36
11.20	0.10	0.52	0.19*	5.34	0.00	5.34
11.25	0.10	0.52	0.19*	5.31	0.00	5.31
11.30	0.10	0.52	0.20*	5.29	0.00	5.29
11.35	0.10	0.52	0.20*	5.26	0.00	5.26
11.40	0.11	0.52	0.20*	5.24	0.00	5.24
11.45	0.11	0.52	0.21*	5.22	0.00	5.22
11.50	0.11	0.52	0.21*	5.19	0.00	5.19
11.55	0.11	0.52	0.21*	5.17	0.00	5.17
11.60	0.11	0.52	0.22*	5.15	0.00	5.15
11.65	0.11	0.52	0.22*	5.13	0.00	5.13
11.70	0.12	0.52	0.22*	5.10	0.00	5.10
11.75	0.12	0.53	0.23*	5.08	0.00	5.08
11.80	0.12	0.53	0.23*	5.06	0.00	5.06
11.85	0.12	0.53	0.23*	5.04	0.00	5.04
11.90	0.12	0.53	0.24*	5.02	0.00	5.02
11.95	0.13	0.53	0.24*	5.00	0.00	5.00
12.00	0.13	0.53	0.24*	4.98	0.00	4.98
12.05	0.13	0.53	0.25*	4.96	0.00	4.96
12.10	0.13	0.53	0.25*	4.94	0.00	4.94
12.15	0.13	0.53	0.25*	4.92	0.00	4.92
12.20	0.14	0.53	0.26*	4.90	0.00	4.90
12.25	0.14	0.53	0.26*	4.88	0.00	4.88
12.30	0.14	0.53	0.26*	4.86	0.00	4.86
12.35	0.14	0.53	0.27*	4.84	0.00	4.84
12.40	0.14	0.53	0.27*	4.82	0.00	4.82
12.45	0.15	0.53	0.27*	4.80	0.00	4.80
12.50	0.15	0.53	0.28*	4.78	0.00	4.78
12.55	0.15	0.53	0.28*	4.76	0.00	4.76
12.60	0.15	0.53	0.29*	4.74	0.00	4.74
12.65	0.15	0.54	0.29*	4.72	0.00	4.72
12.70	0.16	0.54	0.29*	4.70	0.00	4.70
12.75	0.16	0.54	0.30*	4.68	0.00	4.68
12.80	0.16	0.54	0.30*	4.67	0.00	4.67
12.85	0.16	0.54	0.30*	4.65	0.00	4.65
12.90	0.16	0.54	0.31*	4.63	0.00	4.63
12.95	0.17	0.54	0.31*	4.61	0.00	4.61
13.00	0.17	0.54	0.31*	4.59	0.00	4.59
13.05	0.17	0.54	0.32*	4.58	0.00	4.58
13.10	0.17	0.54	0.32*	4.56	0.00	4.56
13.15	0.17	0.54	0.32*	4.54	0.00	4.54
13.20	0.18	0.54	0.33*	4.53	0.00	4.53
13.25	0.18	0.54	0.33*	4.51	0.00	4.51
13.30	0.18	0.54	0.33*	4.49	0.00	4.49
13.35	0.18	0.54	0.34*	4.47	0.00	4.47
13.40	0.18	0.54	0.34*	4.46	0.00	4.46
13.45	0.19	0.54	0.34*	4.44	0.00	4.44
13.50	0.19	0.54	0.34*	4.43	0.00	4.43
13.55	0.19	0.54	0.35*	4.41	0.00	4.41
13.60	0.19	0.54	0.35*	4.39	0.00	4.39
13.65	0.19	0.55	0.35*	4.38	0.00	4.38
13.70	0.20	0.55	0.36*	4.36	0.00	4.36
13.75	0.20	0.55	0.36*	4.34	0.00	4.34
13.80	0.20	0.55	0.36*	4.33	0.00	4.33
13.85	0.20	0.55	0.37*	4.31	0.00	4.31
13.90	0.20	0.55	0.37*	4.30	0.00	4.30
13.95	0.20	0.55	0.37*	4.28	0.00	4.28
14.00	0.21	0.55	0.38*	4.27	0.00	4.27
14.05	0.21	0.55	0.38*	4.25	0.00	4.25
14.10	0.21	0.55	0.38*	4.24	0.00	4.24
14.15	0.21	0.55	0.39*	4.22	0.00	4.22
14.20	0.21	0.55	0.39*	4.21	0.00	4.21
14.25	0.22	0.55	0.39*	4.19	0.00	4.19
14.30	0.22	0.55	0.39*	4.18	0.00	4.18
14.35	0.22	0.55	0.40*	4.16	0.00	4.16
14.40	0.22	0.55	0.40*	4.15	0.00	4.15
14.45	0.22	0.55	0.40*	4.13	0.00	4.13
14.50	0.22	0.55	0.41*	4.12	0.00	4.12
14.55	0.23	0.55	0.41*	4.10	0.00	4.10
14.60	0.23	0.55	0.41*	4.09	0.00	4.09
14.65	0.23	0.55	0.42*	4.08	0.00	4.08
14.70	0.23	0.55	0.42*	4.06	0.00	4.06
14.75	0.23	0.55	0.42*	4.05	0.00	4.05
14.80	0.26	0.56	0.47*	4.04	0.00	4.04
14.85	0.26	0.56	0.47*	4.02	0.00	4.02
14.90	0.27	0.56	0.48*	4.01	0.00	4.01
14.95	0.27	0.56	0.48*	4.00	0.00	4.00
15.00	0.27	0.56	0.48*	3.99	0.00	3.99
15.05	0.26	0.56	0.48*	3.97	0.00	3.97
15.10	0.26	0.56	0.47*	3.96	0.00	3.96
15.15	0.26	0.56	0.46*	3.95	0.00	3.95
15.20	0.25	0.56	0.45*	3.94	0.00	3.94
15.25	0.25	0.56	0.44*	3.92	0.00	3.92
15.30	0.24	0.56	0.43*	3.91	0.00	3.91
15.35	0.24	0.56	0.42*	3.90	0.00	3.90
15.40	0.23	0.56	0.42*	3.88	0.00	3.88
15.45	0.23	0.56	0.41*	3.87	0.00	3.87
15.50	0.22	0.56	0.40*	3.85	0.00	3.85
15.55	0.22	0.56	0.39*	3.84	0.00	3.84
15.60	0.22	0.56	0.39*	3.83	0.00	3.83
15.65	0.21	0.56	0.38*	3.81	0.00	3.81
15.70	0.21	0.56	0.37*	3.80	0.00	3.80
15.75	0.20	0.56	0.36*	3.78	0.00	3.78
15.80	0.20	0.56	0.36*	3.77	0.00	3.77
15.85	0.20	0.56	0.35*	3.75	0.00	3.75
15.90	0.19	0.56	0.34*	3.73	0.00	3.73
15.95	0.19	0.56	0.33*	3.72	0.00	3.72
16.00	0.18	0.56	0.33*	3.70	0.00	3.70
16.05	0.18	0.56	0.32*	3.69	0.00	3.69
16.10	0.18	0.56	0.31*	3.67	0.00	3.67
16.15	0.17	0.56	0.30*	3.65	0.00	3.65
16.20	0.17	0.57	0.30*	3.63	0.00	3.63
16.25	0.16	0.57	0.29*	3.62	0.00	3.62
16.30	0.16	0.57	0.28*	3.60	0.00	3.60
16.35	0.15	0.57	0.27*	3.58	0.00	3.58
16.40	0.15	0.57	0.27*	3.56	0.00	3.56
16.45	0.15	0.57	0.26*	3.54	0.00	3.54
16.50	0.14	0.57	0.25*	3.52	0.00	3.52
16.55	0.14	0.57	0.24*	3.50	0.00	3.50

16.60	0.13	0.57	0.24*	3.48	0.00	3.48
16.65	0.13	0.57	0.23*	3.46	0.00	3.46
16.70	0.13	0.57	0.22*	3.44	0.00	3.44
16.75	0.12	0.57	0.22*	3.42	0.00	3.42
16.80	0.12	0.57	0.21*	3.40	0.00	3.40
16.85	0.12	0.57	0.20*	3.38	0.00	3.38
16.90	0.11	0.57	0.20*	3.36	0.00	3.36
16.95	0.11	0.57	0.19*	3.34	0.00	3.34
17.00	0.10	0.57	0.18*	3.31	0.00	3.31
17.05	0.12	0.57	0.21*	3.29	0.00	3.29
17.10	0.13	0.57	0.23*	3.27	0.00	3.27
17.15	0.15	0.57	0.26*	3.25	0.00	3.25
17.20	0.16	0.57	0.28*	3.23	0.00	3.23
17.25	0.18	0.57	0.31*	3.21	0.00	3.21
17.30	0.19	0.57	0.33*	3.19	0.00	3.19
17.35	0.21	0.57	0.36*	3.18	0.00	3.18
17.40	0.22	0.57	0.38*	3.16	0.00	3.16
17.45	0.23	0.57	0.41*	3.15	0.00	3.15
17.50	0.25	0.57	0.44*	3.13	0.00	3.13
17.55	0.27	0.57	0.46*	3.12	0.00	3.12
17.60	0.28	0.57	0.49*	3.11	0.00	3.11
17.65	0.30	0.57	0.52*	3.10	0.00	3.10
17.70	0.32	0.57	0.56*	3.09	0.00	3.09
17.75	0.34	0.57	0.60*	3.08	0.00	3.08
17.80	0.37	0.57	0.64*	3.07	0.00	3.07
17.85	0.40	0.58	0.70*	3.06	0.00	3.06
17.90	0.45	0.58	0.79*	3.05	0.00	3.05
17.95	2.30	0.58	4.00	3.05	0.00	3.05
18.00	2.30	0.58	3.99	3.05	0.00	3.05
18.05	2.30	0.58	3.99	3.05	0.00	3.05
18.10	2.30	0.58	3.99	3.05	0.00	3.05
18.15	2.30	0.58	3.99	3.05	0.00	3.05
18.20	2.30	0.58	3.99	3.05	0.00	3.05
18.25	2.30	0.58	3.99	3.05	0.00	3.05
18.30	2.30	0.58	3.98	3.05	0.00	3.05
18.35	2.30	0.58	3.98	3.05	0.00	3.05
18.40	2.30	0.58	3.98	3.05	0.00	3.05
18.45	2.30	0.58	3.98	3.05	0.00	3.05
18.50	2.30	0.58	3.98	3.05	0.00	3.05
18.55	2.30	0.58	3.97	3.05	0.00	3.05
18.60	2.30	0.58	3.97	3.05	0.00	3.05
18.65	2.30	0.58	3.97	3.05	0.00	3.05
18.70	2.30	0.58	3.97	3.05	0.00	3.05
18.75	2.30	0.58	3.97	3.05	0.00	3.05
18.80	2.30	0.58	3.97	3.05	0.00	3.05
18.85	2.30	0.58	3.96	3.05	0.00	3.05
18.90	2.30	0.58	3.96	3.05	0.00	3.05
18.95	2.30	0.58	3.96	3.05	0.00	3.05
19.00	2.30	0.58	3.96	3.05	0.00	3.05
19.05	2.30	0.58	3.96	3.05	0.00	3.05
19.10	2.30	0.58	3.96	3.05	0.00	3.05
19.15	2.30	0.58	3.96	3.05	0.00	3.05
19.20	2.30	0.58	3.95	3.05	0.00	3.05
19.25	2.30	0.58	3.95	3.05	0.00	3.05
19.30	2.30	0.58	3.95	3.05	0.00	3.05
19.35	2.30	0.58	3.95	3.05	0.00	3.05
19.40	2.30	0.58	3.95	3.05	0.00	3.05
19.45	2.30	0.58	3.95	3.05	0.00	3.05
19.50	2.30	0.58	3.94	3.05	0.00	3.05
19.55	2.30	0.58	3.94	3.05	0.00	3.05
19.60	2.30	0.58	3.94	3.05	0.00	3.05
19.65	2.30	0.58	3.94	3.05	0.00	3.05
19.70	2.30	0.58	3.94	3.05	0.00	3.05
19.75	2.30	0.58	3.94	3.05	0.00	3.05
19.80	2.30	0.58	3.94	3.05	0.00	3.05
19.85	2.30	0.58	3.93	3.05	0.00	3.05
19.90	2.30	0.58	3.93	3.05	0.00	3.05
19.95	2.30	0.59	3.93	3.05	0.00	3.05
20.00	2.30	0.59	3.93	3.05	0.00	3.05

20.05	2.30	0.59	3.93	3.05	0.00	3.05
20.10	2.30	0.59	3.93	3.05	0.00	3.05
20.15	2.30	0.59	3.93	3.05	0.00	3.05
20.20	2.30	0.59	3.92	3.05	0.00	3.05
20.25	2.30	0.59	3.92	3.05	0.00	3.05
20.30	2.30	0.59	3.92	3.05	0.00	3.05
20.35	2.30	0.59	3.92	3.05	0.00	3.05
20.40	2.30	0.59	3.92	3.05	0.00	3.05
20.45	2.30	0.59	3.92	3.05	0.00	3.05
20.50	2.30	0.59	3.92	3.05	0.00	3.05
20.55	2.30	0.59	3.92	3.05	0.00	3.05
20.60	2.30	0.59	3.91	3.05	0.00	3.05
20.65	2.30	0.59	3.91	3.05	0.00	3.05
20.70	2.30	0.59	3.91	3.05	0.00	3.05
20.75	2.30	0.59	3.91	3.05	0.00	3.05
20.80	2.30	0.59	3.91	3.05	0.00	3.05
20.85	2.30	0.59	3.91	3.05	0.00	3.05
20.90	2.30	0.59	3.91	3.05	0.00	3.05
20.95	2.30	0.59	3.91	3.05	0.00	3.05
21.00	2.30	0.59	3.90	3.05	0.00	3.05
21.05	2.30	0.59	3.90	3.05	0.00	3.05
21.10	2.30	0.59	3.90	3.05	0.00	3.05
21.15	2.30	0.59	3.90	3.05	0.00	3.05
21.20	2.30	0.59	3.90	3.05	0.00	3.05
21.25	2.30	0.59	3.90	3.05	0.00	3.05
21.30	2.30	0.59	3.90	3.05	0.00	3.05
21.35	2.30	0.59	3.90	3.05	0.00	3.05
21.40	2.30	0.59	3.89	3.05	0.00	3.05
21.45	2.30	0.59	3.89	3.05	0.00	3.05
21.50	2.30	0.59	3.89	3.05	0.00	3.05
21.55	2.30	0.59	3.89	3.05	0.00	3.05
21.60	2.30	0.59	3.89	3.05	0.00	3.05
21.65	2.30	0.59	3.89	3.05	0.00	3.05
21.70	2.30	0.59	3.89	3.05	0.00	3.05
21.75	2.30	0.59	3.89	3.05	0.00	3.05
21.80	2.30	0.59	3.89	3.05	0.00	3.05
21.85	2.30	0.59	3.88	3.05	0.00	3.05
21.90	2.30	0.59	3.88	3.05	0.00	3.05
21.95	2.30	0.59	3.88	3.05	0.00	3.05
22.00	2.30	0.59	3.88	3.05	0.00	3.05
22.05	2.30	0.59	3.88	3.05	0.00	3.05
22.10	2.30	0.59	3.88	3.05	0.00	3.05
22.15	2.30	0.59	3.88	3.05	0.00	3.05
22.20	2.30	0.59	3.88	3.05	0.00	3.05
22.25	2.30	0.59	3.88	3.05	0.00	3.05
22.30	2.30	0.59	3.88	3.05	0.00	3.05
22.35	2.30	0.59	3.87	3.05	0.00	3.05
22.40	2.30	0.59	3.87	3.05	0.00	3.05
22.45	2.30	0.59	3.87	3.05	0.00	3.05
22.50	2.30	0.59	3.87	3.05	0.00	3.05
22.55	2.30	0.59	3.87	3.05	0.00	3.05
22.60	2.30	0.59	3.87	3.05	0.00	3.05
22.65	2.30	0.59	3.87	3.05	0.00	3.05
22.70	2.30	0.59	3.87	3.05	0.00	3.05
22.75	2.30	0.59	3.87	3.05	0.00	3.05
22.80	2.30	0.60	3.87	3.05	0.00	3.05
22.85	2.30	0.60	3.86	3.05	0.00	3.05
22.90	2.30	0.60	3.86	3.05	0.00	3.05
22.95	2.30	0.60	3.86	3.05	0.00	3.05
23.00	2.30	0.60	3.86	3.05	0.00	3.05
23.05	2.00	0.60	5.00	3.05	0.00	3.05
23.10	2.00	0.60	5.00	3.05	0.00	3.05
23.15	2.00	0.60	5.00	3.05	0.00	3.05
23.20	2.00	0.60	5.00	3.05	0.00	3.05
23.25	2.00	0.60	5.00	3.05	0.00	3.05
23.30	2.00	0.60	5.00	3.05	0.00	3.05
23.35	2.00	0.60	5.00	3.05	0.00	3.05
23.40	2.00	0.60	5.00	3.05	0.00	3.05
23.45	2.00	0.60	5.00	3.05	0.00	3.05

23.50	2.00	0.60	5.00	3.05	0.00	3.05
23.55	2.00	0.60	5.00	3.05	0.00	3.05
23.60	2.00	0.60	5.00	3.05	0.00	3.05
23.65	2.00	0.60	5.00	3.05	0.00	3.05
23.70	2.00	0.60	5.00	3.05	0.00	3.05
23.75	2.00	0.60	5.00	3.05	0.00	3.05
23.80	2.00	0.60	5.00	3.05	0.00	3.05
23.85	2.00	0.60	5.00	3.05	0.00	3.05
23.90	2.00	0.60	5.00	3.05	0.00	3.05
23.95	2.00	0.60	5.00	3.05	0.00	3.05
24.00	2.00	0.60	5.00	3.05	0.00	3.05
24.05	2.00	0.60	5.00	3.05	0.00	3.05
24.10	2.00	0.60	5.00	3.05	0.00	3.05
24.15	2.00	0.60	5.00	3.05	0.00	3.05
24.20	2.00	0.60	5.00	3.05	0.00	3.05
24.25	2.00	0.60	5.00	3.05	0.00	3.05
24.30	2.00	0.60	5.00	3.05	0.00	3.05
24.35	2.00	0.60	5.00	3.05	0.00	3.05
24.40	2.00	0.60	5.00	3.05	0.00	3.05
24.45	2.00	0.60	5.00	3.05	0.00	3.05
24.50	2.00	0.60	5.00	3.05	0.00	3.05
24.55	2.00	0.60	5.00	3.05	0.00	3.05
24.60	2.00	0.60	5.00	3.05	0.00	3.05
24.65	2.00	0.60	5.00	3.05	0.00	3.05
24.70	2.00	0.60	5.00	3.05	0.00	3.05
24.75	2.00	0.60	5.00	3.05	0.00	3.05
24.80	2.00	0.60	5.00	3.05	0.00	3.05
24.85	2.00	0.60	5.00	3.05	0.00	3.05
24.90	2.00	0.60	5.00	3.05	0.00	3.05
24.95	2.00	0.60	5.00	3.05	0.00	3.05
25.00	2.00	0.60	5.00	3.05	0.00	3.05
25.05	2.00	0.60	5.00	3.05	0.00	3.05
25.10	2.00	0.60	5.00	3.05	0.00	3.05
25.15	2.00	0.60	5.00	3.05	0.00	3.05
25.20	2.00	0.60	5.00	3.05	0.00	3.05
25.25	2.00	0.60	5.00	3.05	0.00	3.05
25.30	2.00	0.60	5.00	3.05	0.00	3.05
25.35	2.00	0.60	5.00	3.05	0.00	3.05
25.40	2.00	0.60	5.00	3.05	0.00	3.05
25.45	2.00	0.60	5.00	3.05	0.00	3.05
25.50	2.00	0.60	5.00	3.05	0.00	3.05
25.55	2.00	0.60	5.00	3.05	0.00	3.05
25.60	2.00	0.60	5.00	3.05	0.00	3.05
25.65	2.00	0.60	5.00	3.05	0.00	3.05
25.70	2.00	0.60	5.00	3.05	0.00	3.05
25.75	2.00	0.60	5.00	3.05	0.00	3.05
25.80	2.00	0.60	5.00	3.05	0.00	3.05
25.85	2.00	0.60	5.00	3.05	0.00	3.05
25.90	2.00	0.60	5.00	3.05	0.00	3.05
25.95	2.00	0.60	5.00	3.05	0.00	3.05
26.00	2.00	0.60	5.00	3.05	0.00	3.05
26.05	2.00	0.60	5.00	3.05	0.00	3.05
26.10	2.00	0.60	5.00	3.05	0.00	3.05
26.15	2.00	0.60	5.00	3.05	0.00	3.05
26.20	2.00	0.60	5.00	3.05	0.00	3.05
26.25	2.00	0.60	5.00	3.05	0.00	3.05
26.30	2.00	0.60	5.00	3.05	0.00	3.05
26.35	2.00	0.60	5.00	3.05	0.00	3.05
26.40	2.00	0.60	5.00	3.05	0.00	3.05
26.45	2.00	0.60	5.00	3.05	0.00	3.05
26.50	2.00	0.60	5.00	3.05	0.00	3.05
26.55	2.00	0.60	5.00	3.05	0.00	3.05
26.60	2.00	0.60	5.00	3.05	0.00	3.05
26.65	2.00	0.60	5.00	3.05	0.00	3.05
26.70	2.00	0.60	5.00	3.05	0.00	3.05
26.75	2.00	0.60	5.00	3.05	0.00	3.05
26.80	2.00	0.60	5.00	3.05	0.00	3.05
26.85	2.00	0.60	5.00	3.05	0.00	3.05
26.90	2.00	0.60	5.00	3.05	0.00	3.05
26.95	2.00	0.60	5.00	3.05	0.00	3.05
27.00	2.00	0.60	5.00	3.05	0.00	3.05
27.05	0.10	0.60	0.16*	3.05	0.00	3.05
27.10	0.10	0.60	0.16*	3.02	0.00	3.02
27.15	0.10	0.61	0.16*	3.00	0.00	3.00
27.20	0.10	0.61	0.16*	2.97	0.00	2.97
27.25	0.10	0.61	0.16*	2.95	0.00	2.95
27.30	0.10	0.61	0.16*	2.92	0.00	2.92
27.35	0.10	0.61	0.16*	2.90	0.00	2.90
27.40	0.10	0.61	0.16*	2.88	0.00	2.88
27.45	0.10	0.61	0.16*	2.85	0.00	2.85
27.50	0.10	0.61	0.16*	2.83	0.00	2.83
27.55	0.10	0.61	0.16*	2.80	0.00	2.80
27.60	0.10	0.61	0.16*	2.78	0.00	2.78
27.65	0.10	0.61	0.16*	2.75	0.00	2.75
27.70	0.10	0.61	0.16*	2.73	0.00	2.73
27.75	0.10	0.61	0.16*	2.70	0.00	2.70
27.80	0.10	0.61	0.16*	2.68	0.00	2.68
27.85	0.10	0.61	0.16*	2.66	0.00	2.66
27.90	0.10	0.61	0.16*	2.63	0.00	2.63
27.95	0.10	0.61	0.16*	2.61	0.00	2.61
28.00	0.10	0.61	0.16*	2.58	0.00	2.58
28.05	0.10	0.61	0.16*	2.56	0.00	2.56
28.10	0.10	0.61	0.16*	2.53	0.00	2.53
28.15	0.10	0.61	0.16*	2.51	0.00	2.51
28.20	0.10	0.61	0.16*	2.49	0.00	2.49
28.25	0.10	0.61	0.16*	2.46	0.00	2.46
28.30	0.10	0.61	0.16*	2.44	0.00	2.44
28.35	0.10	0.61	0.16*	2.41	0.00	2.41
28.40	0.10	0.61	0.16*	2.39	0.00	2.39
28.45	0.10	0.61	0.16*	2.36	0.00	2.36
28.50	0.10	0.61	0.16*	2.34	0.00	2.34
28.55	0.10	0.61	0.16*	2.32	0.00	2.32
28.60	0.10	0.61	0.16*	2.29	0.00	2.29
28.65	0.10	0.61	0.16*	2.27	0.00	2.27
28.70	0.10	0.61	0.16*	2.24	0.00	2.24
28.75	0.10	0.61	0.16*	2.22	0.00	2.22
28.80	0.10	0.61	0.16*	2.19	0.00	2.19
28.85	0.10	0.61	0.16*	2.17	0.00	2.17
28.90	0.10	0.61	0.16*	2.15	0.00	2.15
28.95	0.10	0.61	0.16*	2.12	0.00	2.12
29.00	0.10	0.61	0.16*	2.10	0.00	2.10
29.05	0.10	0.61	0.17*	2.07	0.00	2.07
29.10	0.10	0.61	0.17*	2.05	0.00	2.05
29.15	0.10	0.61	0.17*	2.03	0.00	2.03
29.20	0.10	0.61	0.17*	2.00	0.00	2.00
29.25	0.11	0.61	0.17*	1.98	0.00	1.98
29.30	0.11	0.61	0.18*	1.95	0.00	1.95
29.35	0.11	0.61	0.18*	1.93	0.00	1.93
29.40	0.11	0.61	0.18*	1.91	0.00	1.91
29.45	0.11	0.61	0.18*	1.89	0.00	1.89
29.50	0.11	0.61	0.19*	1.86	0.00	1.86
29.55	0.11	0.61	0.19*	1.84	0.00	1.84
29.60	0.12	0.61	0.19*	1.82	0.00	1.82
29.65	0.12	0.61	0.19*	1.80	0.00	1.80
29.70	0.12	0.61	0.20*	1.78	0.00	1.78
29.75	0.12	0.61	0.20*	1.75	0.00	1.75
29.80	0.12	0.61	0.20*	1.73	0.00	1.73
29.85	0.12	0.61	0.20*	1.71	0.00	1.71
29.90	0.12	0.61	0.21*	1.69	0.00	1.69
29.95	0.13	0.61	0.21*	1.67	0.00	1.67
30.00	0.13	0.61	0.21*	1.65	0.00	1.65
30.05	0.13	0.61	0.21*	1.63	0.00	1.63
30.10	0.13	0.61	0.22*	1.61	0.00	1.61
30.15	0.13	0.61	0.22*	1.59	0.00	1.59
30.20	0.13	0.61	0.22*	1.57	0.00	1.57
30.25	0.14	0.61	0.22*	1.55	0.00	1.55
30.30	0.14	0.61	0.23*	1.53	0.00	1.53
30.35	0.14	0.61	0.23*	1.51	0.00	1.51

30.40	0.14	0.61	0.23*	1.49	0.00	1.49
30.45	0.14	0.61	0.23*	1.47	0.00	1.47
30.50	0.14	0.61	0.24*	1.45	0.00	1.45
30.55	0.15	0.61	0.24*	1.43	0.00	1.43
30.60	0.15	0.61	0.24*	1.41	0.00	1.41
30.65	0.15	0.61	0.24*	1.39	0.00	1.39
30.70	0.15	0.61	0.25*	1.37	0.00	1.37
30.75	0.15	0.61	0.25*	1.35	0.00	1.35
30.80	0.15	0.61	0.25*	1.33	0.00	1.33
30.85	0.15	0.61	0.25*	1.32	0.00	1.32
30.90	0.16	0.61	0.26*	1.30	0.00	1.30
30.95	0.16	0.61	0.26*	1.28	0.00	1.28
31.00	0.16	0.61	0.26*	1.26	0.00	1.26
31.05	0.16	0.61	0.26*	1.24	0.00	1.24
31.10	0.16	0.61	0.26*	1.22	0.00	1.22
31.15	0.16	0.61	0.26*	1.21	0.00	1.21
31.20	0.16	0.61	0.26*	1.19	0.00	1.19
31.25	0.16	0.61	0.26*	1.17	0.00	1.17
31.30	0.16	0.61	0.27*	1.15	0.00	1.15
31.35	0.16	0.61	0.27*	1.13	0.00	1.13
31.40	0.16	0.61	0.27*	1.11	0.00	1.11
31.45	0.16	0.60	0.27*	1.10	0.00	1.10
31.50	0.16	0.60	0.27*	1.08	0.00	1.08
31.55	0.16	0.60	0.27*	1.06	0.00	1.06
31.60	0.16	0.60	0.27*	1.04	0.00	1.04
31.65	0.16	0.60	0.27*	1.02	0.00	1.02
31.70	0.17	0.60	0.27*	1.01	0.00	1.01
31.75	0.17	0.60	0.27*	0.99	0.00	0.99
31.80	0.17	0.60	0.28*	0.97	0.00	0.97
31.85	0.17	0.60	0.28*	0.95	0.00	0.95
31.90	0.17	0.60	0.28*	0.94	0.00	0.94
31.95	0.17	0.60	0.28*	0.92	0.00	0.92
32.00	0.17	0.60	0.28*	0.90	0.00	0.90
32.05	0.17	0.60	0.28*	0.88	0.00	0.88
32.10	0.17	0.60	0.28*	0.87	0.00	0.87
32.15	0.17	0.60	0.28*	0.85	0.00	0.85
32.20	0.17	0.60	0.28*	0.83	0.00	0.83
32.25	0.17	0.60	0.28*	0.81	0.00	0.81
32.30	0.17	0.60	0.28*	0.80	0.00	0.80
32.35	0.17	0.60	0.29*	0.78	0.00	0.78
32.40	0.17	0.60	0.29*	0.76	0.00	0.76
32.45	0.17	0.60	0.29*	0.74	0.00	0.74
32.50	0.17	0.60	0.29*	0.73	0.00	0.73
32.55	0.17	0.60	0.29*	0.71	0.00	0.71
32.60	0.17	0.60	0.29*	0.69	0.00	0.69
32.65	0.18	0.60	0.29*	0.68	0.00	0.68
32.70	0.18	0.60	0.29*	0.66	0.00	0.66
32.75	0.18	0.60	0.29*	0.64	0.00	0.64
32.80	0.18	0.60	0.29*	0.62	0.00	0.62
32.85	0.18	0.60	0.29*	0.61	0.00	0.61
32.90	0.18	0.60	0.30*	0.59	0.00	0.59
32.95	0.18	0.60	0.30*	0.57	0.00	0.57
33.00	0.18	0.60	0.30*	0.56	0.00	0.56
33.05	0.18	0.60	0.30*	0.54	0.00	0.54
33.10	0.18	0.60	0.30*	0.52	0.00	0.52
33.15	0.18	0.60	0.30*	0.51	0.00	0.51
33.20	0.18	0.60	0.30*	0.49	0.00	0.49
33.25	0.18	0.60	0.30*	0.47	0.00	0.47
33.30	0.18	0.60	0.30*	0.46	0.00	0.46
33.35	0.18	0.60	0.30*	0.44	0.00	0.44
33.40	0.18	0.60	0.31*	0.42	0.00	0.42
33.45	0.18	0.60	0.31*	0.41	0.00	0.41
33.50	0.18	0.60	0.31*	0.39	0.00	0.39
33.55	0.18	0.60	0.31*	0.37	0.00	0.37
33.60	0.18	0.60	0.31*	0.36	0.00	0.36
33.65	0.19	0.60	0.31*	0.34	0.00	0.34
33.70	0.19	0.60	0.31*	0.32	0.00	0.32
33.75	0.19	0.60	0.31*	0.31	0.00	0.31
33.80	0.19	0.60	0.31*	0.29	0.00	0.29
33.85	0.19	0.60	0.31*	0.28	0.00	0.28
33.90	0.19	0.60	0.31*	0.26	0.00	0.26
33.95	0.19	0.60	0.32*	0.24	0.00	0.24
34.00	0.19	0.60	0.32*	0.23	0.00	0.23
34.05	0.20	0.60	0.33*	0.21	0.00	0.21
34.10	0.21	0.60	0.35*	0.19	0.00	0.19
34.15	0.22	0.60	0.36*	0.18	0.00	0.18
34.20	0.23	0.60	0.38*	0.16	0.00	0.16
34.25	0.24	0.60	0.40*	0.15	0.00	0.15
34.30	0.25	0.60	0.41*	0.14	0.00	0.14
34.35	0.26	0.60	0.43*	0.12	0.00	0.12
34.40	0.27	0.60	0.45*	0.11	0.00	0.11
34.45	0.28	0.60	0.47*	0.10	0.00	0.10
34.50	0.29	0.60	0.49*	0.09	0.00	0.09
34.55	0.30	0.59	0.51*	0.08	0.00	0.08
34.60	0.32	0.59	0.53*	0.06	0.00	0.06
34.65	0.33	0.59	0.56*	0.05	0.00	0.05
34.70	0.35	0.59	0.58*	0.04	0.00	0.04
34.75	0.36	0.59	0.61*	0.03	0.00	0.03
34.80	0.38	0.59	0.64*	0.02	0.00	0.02
34.85	0.41	0.59	0.68*	0.02	0.00	0.02
34.90	0.44	0.59	0.74*	0.01	0.00	0.01
34.95	0.50	0.59	0.85*	0.00	0.00	0.00
35.00	2.30	0.59	3.88	0.00	0.00	0.00
35.05	2.30	0.59	3.88	0.00	0.00	0.00
35.10	2.30	0.59	3.88	0.00	0.00	0.00
35.15	2.30	0.59	3.88	0.00	0.00	0.00
35.20	2.30	0.59	3.88	0.00	0.00	0.00
35.25	2.30	0.59	3.88	0.00	0.00	0.00
35.30	2.30	0.59	3.89	0.00	0.00	0.00
35.35	2.30	0.59	3.89	0.00	0.00	0.00
35.40	2.30	0.59	3.89	0.00	0.00	0.00
35.45	2.30	0.59	3.89	0.00	0.00	0.00
35.50	2.30	0.59	3.89	0.00	0.00	0.00
35.55	2.30	0.59	3.89	0.00	0.00	0.00
35.60	2.30	0.59	3.89	0.00	0.00	0.00
35.65	2.30	0.59	3.89	0.00	0.00	0.00
35.70	2.30	0.59	3.90	0.00	0.00	0.00
35.75	2.30	0.59	3.90	0.00	0.00	0.00
35.80	2.30	0.59	3.90	0.00	0.00	0.00
35.85	2.30	0.59	3.90	0.00	0.00	0.00
35.90	2.30	0.59	3.90	0.00	0.00	0.00
35.95	2.30	0.59	3.90	0.00	0.00	0.00
36.00	2.30	0.59	3.90	0.00	0.00	0.00
36.05	2.30	0.59	3.91	0.00	0.00	0.00
36.10	2.30	0.59	3.91	0.00	0.00	0.00
36.15	2.30	0.59	3.91	0.00	0.00	0.00
36.20	2.30	0.59	3.91	0.00	0.00	0.00
36.25	2.30	0.59	3.91	0.00	0.00	0.00
36.30	2.30	0.59	3.91	0.00	0.00	0.00
36.35	2.30	0.59	3.91	0.00	0.00	0.00
36.40	2.30	0.59	3.92	0.00	0.00	0.00
36.45	2.30	0.59	3.92	0.00	0.00	0.00
36.50	2.30	0.59	3.92	0.00	0.00	0.00
36.55	2.30	0.59	3.92	0.00	0.00	0.00
36.60	2.30	0.59	3.92	0.00	0.00	0.00
36.65	2.30	0.59	3.92	0.00	0.00	0.00
36.70	2.30	0.59	3.92	0.00	0.00	0.00
36.75	2.30	0.59	3.93	0.00	0.00	0.00
36.80	2.30	0.59	3.93	0.00	0.00	0.00
36.85	2.30	0.59	3.93	0.00	0.00	0.00
36.90	2.30	0.59	3.93	0.00	0.00	0.00
36.95	2.30	0.58	3.93	0.00	0.00	0.00
37.00	2.30	0.58	3.93	0.00	0.00	0.00
37.05	2.30	0.58	3.94	0.00	0.00	0.00
37.10	2.30	0.58	3.94	0.00	0.00	0.00
37.15	2.30	0.58	3.94	0.00	0.00	0.00
37.20	2.30	0.58	3.94	0.00	0.00	0.00
37.25	2.30	0.58	3.94	0.00	0.00	0.00

37.30	2.30	0.58	3.94	0.00	0.00	0.00
37.35	2.30	0.58	3.95	0.00	0.00	0.00
37.40	2.30	0.58	3.95	0.00	0.00	0.00
37.45	2.30	0.58	3.95	0.00	0.00	0.00
37.50	2.30	0.58	3.95	0.00	0.00	0.00
37.55	2.30	0.58	3.95	0.00	0.00	0.00
37.60	2.30	0.58	3.95	0.00	0.00	0.00
37.65	2.30	0.58	3.95	0.00	0.00	0.00
37.70	2.30	0.58	3.96	0.00	0.00	0.00
37.75	2.30	0.58	3.96	0.00	0.00	0.00
37.80	2.30	0.58	3.96	0.00	0.00	0.00
37.85	2.30	0.58	3.96	0.00	0.00	0.00
37.90	2.30	0.58	3.96	0.00	0.00	0.00
37.95	2.30	0.58	3.97	0.00	0.00	0.00
38.00	2.30	0.58	3.97	0.00	0.00	0.00
38.05	2.30	0.58	3.97	0.00	0.00	0.00
38.10	2.30	0.58	3.97	0.00	0.00	0.00
38.15	2.30	0.58	3.97	0.00	0.00	0.00
38.20	2.30	0.58	3.97	0.00	0.00	0.00
38.25	2.30	0.58	3.98	0.00	0.00	0.00
38.30	2.30	0.58	3.98	0.00	0.00	0.00
38.35	2.30	0.58	3.98	0.00	0.00	0.00
38.40	2.30	0.58	3.98	0.00	0.00	0.00
38.45	2.30	0.58	3.98	0.00	0.00	0.00
38.50	2.30	0.58	3.98	0.00	0.00	0.00
38.55	2.30	0.58	3.99	0.00	0.00	0.00
38.60	2.30	0.58	3.99	0.00	0.00	0.00
38.65	2.30	0.58	3.99	0.00	0.00	0.00
38.70	2.30	0.58	3.99	0.00	0.00	0.00
38.75	2.30	0.58	3.99	0.00	0.00	0.00
38.80	2.30	0.58	3.99	0.00	0.00	0.00
38.85	2.30	0.58	4.00	0.00	0.00	0.00
38.90	2.30	0.58	4.00	0.00	0.00	0.00
38.95	2.30	0.58	4.00	0.00	0.00	0.00
39.00	2.30	0.57	4.00	0.00	0.00	0.00
39.05	2.30	0.57	4.00	0.00	0.00	0.00
39.10	2.30	0.57	4.01	0.00	0.00	0.00
39.15	2.30	0.57	4.01	0.00	0.00	0.00
39.20	2.30	0.57	4.01	0.00	0.00	0.00
39.25	2.30	0.57	4.01	0.00	0.00	0.00
39.30	2.30	0.57	4.01	0.00	0.00	0.00
39.35	2.30	0.57	4.02	0.00	0.00	0.00
39.40	2.30	0.57	4.02	0.00	0.00	0.00
39.45	2.30	0.57	4.02	0.00	0.00	0.00
39.50	2.30	0.57	4.02	0.00	0.00	0.00
39.55	2.30	0.57	4.02	0.00	0.00	0.00
39.60	2.30	0.57	4.02	0.00	0.00	0.00
39.65	2.30	0.57	4.03	0.00	0.00	0.00
39.70	2.30	0.57	4.03	0.00	0.00	0.00
39.75	2.30	0.57	4.03	0.00	0.00	0.00
39.80	2.30	0.57	4.03	0.00	0.00	0.00
39.85	2.30	0.57	4.03	0.00	0.00	0.00
39.90	2.30	0.57	4.04	0.00	0.00	0.00
39.95	2.30	0.57	4.04	0.00	0.00	0.00
40.00	2.30	0.57	4.04	0.00	0.00	0.00
40.05	2.30	0.57	4.04	0.00	0.00	0.00
40.10	2.30	0.57	4.04	0.00	0.00	0.00
40.15	2.30	0.57	4.05	0.00	0.00	0.00
40.20	2.30	0.57	4.05	0.00	0.00	0.00
40.25	2.30	0.57	4.05	0.00	0.00	0.00
40.30	2.30	0.57	4.05	0.00	0.00	0.00
40.35	2.30	0.57	4.05	0.00	0.00	0.00
40.40	2.30	0.57	4.05	0.00	0.00	0.00
40.45	2.30	0.57	4.06	0.00	0.00	0.00
40.50	2.30	0.57	4.06	0.00	0.00	0.00
40.55	2.30	0.57	4.06	0.00	0.00	0.00
40.60	2.30	0.57	4.06	0.00	0.00	0.00
40.65	2.30	0.57	4.06	0.00	0.00	0.00
40.70	2.30	0.57	4.07	0.00	0.00	0.00
40.75	2.30	0.57	4.07	0.00	0.00	0.00
40.80	2.30	0.57	4.07	0.00	0.00	0.00
40.85	2.30	0.56	4.07	0.00	0.00	0.00
40.90	2.30	0.56	4.07	0.00	0.00	0.00
40.95	2.30	0.56	4.08	0.00	0.00	0.00
41.00	2.30	0.56	4.08	0.00	0.00	0.00
41.05	2.30	0.56	4.08	0.00	0.00	0.00
41.10	2.30	0.56	4.08	0.00	0.00	0.00
41.15	2.30	0.56	4.08	0.00	0.00	0.00
41.20	2.30	0.56	4.09	0.00	0.00	0.00
41.25	2.30	0.56	4.09	0.00	0.00	0.00
41.30	2.30	0.56	4.09	0.00	0.00	0.00
41.35	2.30	0.56	4.09	0.00	0.00	0.00
41.40	2.30	0.56	4.09	0.00	0.00	0.00
41.45	2.30	0.56	4.10	0.00	0.00	0.00
41.50	2.30	0.56	4.10	0.00	0.00	0.00
41.55	2.30	0.56	4.10	0.00	0.00	0.00
41.60	2.30	0.56	4.10	0.00	0.00	0.00
41.65	2.30	0.56	4.10	0.00	0.00	0.00
41.70	2.30	0.56	4.10	0.00	0.00	0.00
41.75	2.30	0.56	4.11	0.00	0.00	0.00
41.80	2.30	0.56	4.11	0.00	0.00	0.00
41.85	2.30	0.56	4.11	0.00	0.00	0.00
41.90	2.30	0.56	4.11	0.00	0.00	0.00
41.95	2.30	0.56	4.11	0.00	0.00	0.00
42.00	2.30	0.56	4.12	0.00	0.00	0.00
42.05	2.30	0.56	4.12	0.00	0.00	0.00
42.10	2.30	0.56	4.12	0.00	0.00	0.00
42.15	2.30	0.56	4.12	0.00	0.00	0.00
42.20	2.30	0.56	4.12	0.00	0.00	0.00
42.25	2.30	0.56	4.13	0.00	0.00	0.00
42.30	2.30	0.56	4.13	0.00	0.00	0.00
42.35	2.30	0.56	4.13	0.00	0.00	0.00
42.40	2.30	0.56	4.13	0.00	0.00	0.00
42.45	2.30	0.56	4.13	0.00	0.00	0.00
42.50	2.30	0.56	4.14	0.00	0.00	0.00
42.55	2.30	0.56	4.14	0.00	0.00	0.00
42.60	2.30	0.56	4.14	0.00	0.00	0.00
42.65	2.30	0.56	4.14	0.00	0.00	0.00
42.70	2.30	0.56	4.14	0.00	0.00	0.00
42.75	2.30	0.55	4.15	0.00	0.00	0.00
42.80	2.30	0.55	4.15	0.00	0.00	0.00
42.85	2.30	0.55	4.15	0.00	0.00	0.00
42.90	2.30	0.55	4.15	0.00	0.00	0.00
42.95	2.30	0.55	4.15	0.00	0.00	0.00
43.00	2.30	0.55	4.16	0.00	0.00	0.00
43.05	2.30	0.55	4.16	0.00	0.00	0.00
43.10	2.30	0.55	4.16	0.00	0.00	0.00
43.15	2.30	0.55	4.16	0.00	0.00	0.00
43.20	2.30	0.55	4.16	0.00	0.00	0.00
43.25	2.30	0.55	4.17	0.00	0.00	0.00
43.30	2.30	0.55	4.17	0.00	0.00	0.00
43.35	2.30	0.55	4.17	0.00	0.00	0.00
43.40	2.30	0.55	4.17	0.00	0.00	0.00
43.45	2.30	0.55	4.17	0.00	0.00	0.00
43.50	2.30	0.55	4.18	0.00	0.00	0.00
43.55	2.30	0.55	4.18	0.00	0.00	0.00
43.60	2.30	0.55	4.18	0.00	0.00	0.00
43.65	2.30	0.55	4.18	0.00	0.00	0.00
43.70	2.30	0.55	4.18	0.00	0.00	0.00
43.75	2.30	0.55	4.19	0.00	0.00	0.00
43.80	2.30	0.55	4.19	0.00	0.00	0.00
43.85	2.30	0.55	4.19	0.00	0.00	0.00
43.90	2.30	0.55	4.19	0.00	0.00	0.00
43.95	2.30	0.55	4.20	0.00	0.00	0.00
44.00	2.30	0.55	4.20	0.00	0.00	0.00
44.05	2.30	0.55	4.20	0.00	0.00	0.00
44.10	2.30	0.55	4.20	0.00	0.00	0.00
44.15	2.30	0.55	4.20	0.00	0.00	0.00

44.20	2.30	0.55	4.21	0.00	0.00	0.00
44.25	2.30	0.55	4.21	0.00	0.00	0.00
44.30	2.30	0.55	4.21	0.00	0.00	0.00
44.35	2.30	0.55	4.21	0.00	0.00	0.00
44.40	2.30	0.55	4.21	0.00	0.00	0.00
44.45	2.30	0.55	4.22	0.00	0.00	0.00
44.50	2.30	0.55	4.22	0.00	0.00	0.00
44.55	2.30	0.55	4.22	0.00	0.00	0.00
44.60	2.30	0.54	4.22	0.00	0.00	0.00
44.65	2.30	0.54	4.22	0.00	0.00	0.00
44.70	2.30	0.54	4.23	0.00	0.00	0.00
44.75	2.30	0.54	4.23	0.00	0.00	0.00
44.80	2.30	0.54	4.23	0.00	0.00	0.00
44.85	2.30	0.54	4.23	0.00	0.00	0.00
44.90	2.30	0.54	4.23	0.00	0.00	0.00
44.95	2.30	0.54	4.24	0.00	0.00	0.00
45.00	2.30	0.54	4.24	0.00	0.00	0.00
45.05	2.30	0.54	4.24	0.00	0.00	0.00
45.10	2.30	0.54	4.24	0.00	0.00	0.00
45.15	2.30	0.54	4.24	0.00	0.00	0.00
45.20	2.30	0.54	4.25	0.00	0.00	0.00
45.25	2.30	0.54	4.25	0.00	0.00	0.00
45.30	2.30	0.54	4.25	0.00	0.00	0.00
45.35	2.30	0.54	4.25	0.00	0.00	0.00
45.40	2.30	0.54	4.26	0.00	0.00	0.00
45.45	2.30	0.54	4.26	0.00	0.00	0.00
45.50	2.30	0.54	4.26	0.00	0.00	0.00
45.55	2.30	0.54	4.26	0.00	0.00	0.00
45.60	2.30	0.54	4.26	0.00	0.00	0.00
45.65	2.30	0.54	4.27	0.00	0.00	0.00
45.70	2.30	0.54	4.27	0.00	0.00	0.00
45.75	2.30	0.54	4.27	0.00	0.00	0.00
45.80	2.30	0.54	4.27	0.00	0.00	0.00
45.85	2.30	0.54	4.27	0.00	0.00	0.00
45.90	2.30	0.54	4.28	0.00	0.00	0.00
45.95	2.30	0.54	4.28	0.00	0.00	0.00
46.00	2.30	0.54	4.28	0.00	0.00	0.00
46.05	2.30	0.54	4.28	0.00	0.00	0.00
46.10	2.30	0.54	4.29	0.00	0.00	0.00
46.15	2.30	0.54	4.29	0.00	0.00	0.00
46.20	2.30	0.54	4.29	0.00	0.00	0.00
46.25	2.30	0.54	4.29	0.00	0.00	0.00
46.30	2.30	0.54	4.29	0.00	0.00	0.00
46.35	2.30	0.54	4.30	0.00	0.00	0.00
46.40	2.30	0.54	4.30	0.00	0.00	0.00
46.45	2.30	0.53	4.30	0.00	0.00	0.00
46.50	2.30	0.53	4.30	0.00	0.00	0.00
46.55	2.30	0.53	4.30	0.00	0.00	0.00
46.60	2.30	0.53	4.31	0.00	0.00	0.00
46.65	2.30	0.53	4.31	0.00	0.00	0.00
46.70	2.30	0.53	4.31	0.00	0.00	0.00
46.75	2.30	0.53	4.31	0.00	0.00	0.00
46.80	2.30	0.53	4.32	0.00	0.00	0.00
46.85	2.30	0.53	4.32	0.00	0.00	0.00
46.90	2.30	0.53	4.32	0.00	0.00	0.00
46.95	2.30	0.53	4.32	0.00	0.00	0.00
47.00	2.30	0.53	4.32	0.00	0.00	0.00
47.05	2.30	0.53	4.33	0.00	0.00	0.00
47.10	2.30	0.53	4.33	0.00	0.00	0.00
47.15	2.30	0.53	4.33	0.00	0.00	0.00
47.20	2.30	0.53	4.33	0.00	0.00	0.00
47.25	2.30	0.53	4.34	0.00	0.00	0.00
47.30	2.30	0.53	4.34	0.00	0.00	0.00
47.35	2.30	0.53	4.34	0.00	0.00	0.00
47.40	2.30	0.53	4.34	0.00	0.00	0.00
47.45	2.30	0.53	4.34	0.00	0.00	0.00
47.50	2.30	0.53	4.35	0.00	0.00	0.00
47.55	2.30	0.53	4.35	0.00	0.00	0.00
47.60	2.30	0.53	4.35	0.00	0.00	0.00
47.65	2.30	0.53	4.35	0.00	0.00	0.00
47.70	2.30	0.53	4.36	0.00	0.00	0.00
47.75	2.30	0.53	4.36	0.00	0.00	0.00
47.80	2.30	0.53	4.36	0.00	0.00	0.00
47.85	2.30	0.53	4.36	0.00	0.00	0.00
47.90	2.30	0.53	4.36	0.00	0.00	0.00
47.95	2.30	0.53	4.37	0.00	0.00	0.00
48.00	2.30	0.53	4.37	0.00	0.00	0.00
48.05	2.30	0.53	4.37	0.00	0.00	0.00
48.10	2.30	0.53	4.37	0.00	0.00	0.00
48.15	2.30	0.53	4.38	0.00	0.00	0.00
48.20	2.30	0.53	4.38	0.00	0.00	0.00
48.25	2.30	0.53	4.38	0.00	0.00	0.00
48.30	2.30	0.52	4.38	0.00	0.00	0.00
48.35	2.30	0.52	4.38	0.00	0.00	0.00
48.40	2.30	0.52	4.39	0.00	0.00	0.00
48.45	2.30	0.52	4.39	0.00	0.00	0.00
48.50	2.30	0.52	4.39	0.00	0.00	0.00
48.55	2.30	0.52	4.39	0.00	0.00	0.00
48.60	2.30	0.52	4.40	0.00	0.00	0.00
48.65	2.30	0.52	4.40	0.00	0.00	0.00
48.70	2.30	0.52	4.40	0.00	0.00	0.00
48.75	2.30	0.52	4.40	0.00	0.00	0.00
48.80	2.30	0.52	4.40	0.00	0.00	0.00
48.85	2.30	0.52	4.41	0.00	0.00	0.00
48.90	2.30	0.52	4.41	0.00	0.00	0.00
48.95	2.30	0.52	4.41	0.00	0.00	0.00
49.00	2.30	0.52	4.41	0.00	0.00	0.00
49.05	2.30	0.52	4.42	0.00	0.00	0.00
49.10	2.30	0.52	4.42	0.00	0.00	0.00
49.15	2.30	0.52	4.42	0.00	0.00	0.00
49.20	2.30	0.52	4.42	0.00	0.00	0.00
49.25	2.30	0.52	4.43	0.00	0.00	0.00
49.30	2.30	0.52	4.43	0.00	0.00	0.00
49.35	2.30	0.52	4.43	0.00	0.00	0.00
49.40	2.30	0.52	4.43	0.00	0.00	0.00
49.45	2.30	0.52	4.43	0.00	0.00	0.00
49.50	2.30	0.52	4.44	0.00	0.00	0.00
49.55	2.30	0.52	4.44	0.00	0.00	0.00
49.60	2.30	0.52	4.44	0.00	0.00	0.00
49.65	2.30	0.52	4.44	0.00	0.00	0.00
49.70	2.30	0.52	4.45	0.00	0.00	0.00
49.75	2.30	0.52	4.45	0.00	0.00	0.00
49.80	2.30	0.52	4.45	0.00	0.00	0.00
49.85	2.30	0.52	4.45	0.00	0.00	0.00
49.90	2.30	0.52	4.46	0.00	0.00	0.00
49.95	2.30	0.52	4.46	0.00	0.00	0.00
50.00	2.30	0.52	4.46	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Depth = ft, Stress or Pressure = tsf (atm), Unit Weight = pcf, Settlement = in.

CRRm	Cyclic resistance ratio from soils
CSRfs	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRfs
S_sat	Settlement from saturated sands
S_dry	Settlement from dry sands
S_all	Total settlement from saturated and dry sands
NoLiq	No-Liquefy Soils

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Input File Name: E:\VB&B\Woodfin\Boring 4.liq
Title: Woodfin Suites
Subtitle: B-4

Surface Elev.=3
Hole No.=B-4
Depth of Hole= 50.0 ft
Water Table during Earthquake= 0.0 ft
Water Table during In-Situ Testing= 4.0 ft
Max. Acceleration= 0.5 g
Earthquake Magnitude= 7.1

Input Data:

Surface Elev.=3
Hole No.=B-4
Depth of Hole=50.0 ft
Water Table during Earthquake= 0.0 ft
Water Table during In-Situ Testing= 4.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=7.1

Earthquake Magnitude=7.1
2. Settlement Analysis Method: Ishihara / Yoshimine*
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1
7. Borehole Diameter, Cb= 1.15
8. Sampeling Method, Cs= 1
9. User request factor of safty (apply to CSR) , User= 1.2
Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.0	18.0	100.0	NoLiq
1.0	18.0	110.0	NoLiq
3.0	18.0	110.0	NoLiq
4.0	18.0	110.0	NoLiq
6.0	4.0	110.0	16.0
7.0	4.0	110.0	16.0
9.0	6.0	110.0	2.0
11.0	10.0	110.0	2.0
13.0	8.0	110.0	9.0
15.0	29.0	110.0	9.0
17.0	29.0	110.0	NoLiq
19.0	29.0	110.0	NoLiq
21.0	29.0	110.0	NoLiq
26.0	29.0	110.0	NoLiq
27.0	6.0	110.0	35.0
29.0	6.0	110.0	NoLiq
36.0	6.0	110.0	NoLiq
37.0	6.0	110.0	NoLiq
40.0	67.0	120.0	12.0
41.0	67.0	120.0	12.0
46.0	35.0	120.0	12.0
48.0	40.0	120.0	12.0

Output Results:
Settlement of saturated sands=3.73 in.
Settlement of dry sands=0.00 in.
Total settlement of saturated and dry sands=3.73 in.
Differential Settlement=1.867 to 2.465 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.00	0.32	5.00	3.73	0.00	3.73
0.05	2.00	0.86	5.00	3.73	0.00	3.73
0.10	2.00	0.86	5.00	3.73	0.00	3.73
0.15	2.00	0.86	5.00	3.73	0.00	3.73
0.20	2.00	0.85	5.00	3.73	0.00	3.73
0.25	2.00	0.85	5.00	3.73	0.00	3.73
0.30	2.00	0.85	5.00	3.73	0.00	3.73
0.35	2.00	0.84	5.00	3.73	0.00	3.73
0.40	2.00	0.84	5.00	3.73	0.00	3.73
0.45	2.00	0.84	5.00	3.73	0.00	3.73
0.50	2.00	0.83	5.00	3.73	0.00	3.73
0.55	2.00	0.83	5.00	3.73	0.00	3.73
0.60	2.00	0.83	5.00	3.73	0.00	3.73
0.65	2.00	0.82	5.00	3.73	0.00	3.73
0.70	2.00	0.82	5.00	3.73	0.00	3.73
0.75	2.00	0.82	5.00	3.73	0.00	3.73
0.80	2.00	0.81	5.00	3.73	0.00	3.73
0.85	2.00	0.81	5.00	3.73	0.00	3.73
0.90	2.00	0.81	5.00	3.73	0.00	3.73
0.95	2.00	0.80	5.00	3.73	0.00	3.73
1.00	2.00	0.80	5.00	3.73	0.00	3.73
1.05	2.00	0.80	5.00	3.73	0.00	3.73
1.10	2.00	0.80	5.00	3.73	0.00	3.73
1.15	2.00	0.79	5.00	3.73	0.00	3.73
1.20	2.00	0.79	5.00	3.73	0.00	3.73
1.25	2.00	0.79	5.00	3.73	0.00	3.73
1.30	2.00	0.79	5.00	3.73	0.00	3.73
1.35	2.00	0.79	5.00	3.73	0.00	3.73
1.40	2.00	0.78	5.00	3.73	0.00	3.73
1.45	2.00	0.78	5.00	3.73	0.00	3.73
1.50	2.00	0.78	5.00	3.73	0.00	3.73
1.55	2.00	0.78	5.00	3.73	0.00	3.73
1.60	2.00	0.78	5.00	3.73	0.00	3.73
1.65	2.00	0.78	5.00	3.73	0.00	3.73
1.70	2.00	0.78	5.00	3.73	0.00	3.73
1.75	2.00	0.78	5.00	3.73	0.00	3.73
1.80	2.00	0.78	5.00	3.73	0.00	3.73
1.85	2.00	0.77	5.00	3.73	0.00	3.73
1.90	2.00	0.77	5.00	3.73	0.00	3.73
1.95	2.00	0.77	5.00	3.73	0.00	3.73
2.00	2.00	0.77	5.00	3.73	0.00	3.73
2.05	2.00	0.77	5.00	3.73	0.00	3.73
2.10	2.00	0.77	5.00	3.73	0.00	3.73
2.15	2.00	0.77	5.00	3.73	0.00	3.73
2.20	2.00	0.77	5.00	3.73	0.00	3.73
2.25	2.00	0.77	5.00	3.73	0.00	3.73
2.30	2.00	0.77	5.00	3.73	0.00	3.73
2.35	2.00	0.77	5.00	3.73	0.00	3.73
2.40	2.00	0.77	5.00	3.73	0.00	3.73
2.45	2.00	0.77	5.00	3.73	0.00	3.73
2.50	2.00	0.77	5.00	3.73	0.00	3.73
2.55	2.00	0.77	5.00	3.73	0.00	3.73
2.60	2.00	0.77	5.00	3.73	0.00	3.73

2.65	2.00	0.76	5.00	3.73	0.00	3.73
2.70	2.00	0.76	5.00	3.73	0.00	3.73
2.75	2.00	0.76	5.00	3.73	0.00	3.73
2.80	2.00	0.76	5.00	3.73	0.00	3.73
2.85	2.00	0.76	5.00	3.73	0.00	3.73
2.90	2.00	0.76	5.00	3.73	0.00	3.73
2.95	2.00	0.76	5.00	3.73	0.00	3.73
3.00	2.00	0.76	5.00	3.73	0.00	3.73
3.05	2.00	0.76	5.00	3.73	0.00	3.73
3.10	2.00	0.76	5.00	3.73	0.00	3.73
3.15	2.00	0.76	5.00	3.73	0.00	3.73
3.20	2.00	0.76	5.00	3.73	0.00	3.73
3.25	2.00	0.76	5.00	3.73	0.00	3.73
3.30	2.00	0.76	5.00	3.73	0.00	3.73
3.35	2.00	0.76	5.00	3.73	0.00	3.73
3.40	2.00	0.76	5.00	3.73	0.00	3.73
3.45	2.00	0.76	5.00	3.73	0.00	3.73
3.50	2.00	0.76	5.00	3.73	0.00	3.73
3.55	2.00	0.76	5.00	3.73	0.00	3.73
3.60	2.00	0.76	5.00	3.73	0.00	3.73
3.65	2.00	0.76	5.00	3.73	0.00	3.73
3.70	2.00	0.76	5.00	3.73	0.00	3.73
3.75	2.00	0.76	5.00	3.73	0.00	3.73
3.80	2.00	0.76	5.00	3.73	0.00	3.73
3.85	2.00	0.76	5.00	3.73	0.00	3.73
3.90	2.00	0.76	5.00	3.73	0.00	3.73
3.95	2.00	0.76	5.00	3.73	0.00	3.73
4.00	2.00	0.76	5.00	3.73	0.00	3.73
4.05	2.00	0.76	5.00	3.73	0.00	3.73
4.10	2.00	0.76	5.00	3.73	0.00	3.73
4.15	2.00	0.76	5.00	3.73	0.00	3.73
4.20	2.00	0.76	5.00	3.73	0.00	3.73
4.25	2.00	0.75	5.00	3.73	0.00	3.73
4.30	2.00	0.75	5.00	3.73	0.00	3.73
4.35	2.00	0.75	5.00	3.73	0.00	3.73
4.40	2.00	0.75	5.00	3.73	0.00	3.73
4.45	2.00	0.75	5.00	3.73	0.00	3.73
4.50	2.00	0.75	5.00	3.73	0.00	3.73
4.55	2.00	0.75	5.00	3.73	0.00	3.73
4.60	2.00	0.75	5.00	3.73	0.00	3.73
4.65	2.00	0.75	5.00	3.73	0.00	3.73
4.70	2.00	0.75	5.00	3.73	0.00	3.73
4.75	2.00	0.75	5.00	3.73	0.00	3.73
4.80	2.00	0.75	5.00	3.73	0.00	3.73
4.85	2.00	0.75	5.00	3.73	0.00	3.73
4.90	2.00	0.75	5.00	3.73	0.00	3.73
4.95	2.00	0.75	5.00	3.73	0.00	3.73
5.00	2.00	0.75	5.00	3.73	0.00	3.73
5.05	2.00	0.75	5.00	3.73	0.00	3.73
5.10	2.00	0.75	5.00	3.73	0.00	3.73
5.15	2.00	0.75	5.00	3.73	0.00	3.73
5.20	2.00	0.75	5.00	3.73	0.00	3.73
5.25	2.00	0.75	5.00	3.73	0.00	3.73
5.30	2.00	0.75	5.00	3.73	0.00	3.73
5.35	2.00	0.75	5.00	3.73	0.00	3.73
5.40	2.00	0.75	5.00	3.73	0.00	3.73
5.45	2.00	0.75	5.00	3.73	0.00	3.73
5.50	2.00	0.75	5.00	3.73	0.00	3.73
5.55	2.00	0.75	5.00	3.73	0.00	3.73
5.60	2.00	0.75	5.00	3.73	0.00	3.73
5.65	2.00	0.75	5.00	3.73	0.00	3.73
5.70	2.00	0.75	5.00	3.73	0.00	3.73
5.75	2.00	0.75	5.00	3.73	0.00	3.73
5.80	2.00	0.75	5.00	3.73	0.00	3.73
5.85	2.00	0.75	5.00	3.73	0.00	3.73
5.90	2.00	0.75	5.00	3.73	0.00	3.73
5.95	2.00	0.75	5.00	3.73	0.00	3.73
6.00	0.11	0.75	0.14*	3.73	0.00	3.73
6.05	0.11	0.75	0.14*	3.71	0.00	3.71
6.10	0.11	0.75	0.14*	3.69	0.00	3.69
6.15	0.11	0.75	0.14*	3.67	0.00	3.67
6.20	0.11	0.75	0.14*	3.64	0.00	3.64
6.25	0.11	0.75	0.14*	3.62	0.00	3.62
6.30	0.11	0.75	0.14*	3.60	0.00	3.60
6.35	0.11	0.75	0.14*	3.57	0.00	3.57
6.40	0.11	0.75	0.14*	3.55	0.00	3.55
6.45	0.11	0.75	0.14*	3.53	0.00	3.53
6.50	0.11	0.75	0.14*	3.50	0.00	3.50
6.55	0.11	0.75	0.14*	3.48	0.00	3.48
6.60	0.11	0.75	0.14*	3.46	0.00	3.46
6.65	0.11	0.75	0.14*	3.44	0.00	3.44
6.70	0.11	0.75	0.14*	3.41	0.00	3.41
6.75	0.11	0.75	0.14*	3.39	0.00	3.39
6.80	0.11	0.75	0.14*	3.37	0.00	3.37
6.85	0.11	0.75	0.14*	3.34	0.00	3.34
6.90	0.11	0.75	0.14*	3.32	0.00	3.32
6.95	0.11	0.75	0.14*	3.30	0.00	3.30
7.00	0.11	0.75	0.14*	3.27	0.00	3.27
7.05	0.11	0.75	0.14*	3.25	0.00	3.25
7.10	0.11	0.75	0.14*	3.23	0.00	3.23
7.15	0.11	0.75	0.14*	3.20	0.00	3.20
7.20	0.11	0.74	0.14*	3.18	0.00	3.18
7.25	0.11	0.74	0.14*	3.16	0.00	3.16
7.30	0.11	0.74	0.14*	3.14	0.00	3.14
7.35	0.11	0.74	0.14*	3.11	0.00	3.11
7.40	0.11	0.74	0.14*	3.09	0.00	3.09
7.45	0.11	0.74	0.14*	3.07	0.00	3.07
7.50	0.11	0.74	0.14*	3.04	0.00	3.04
7.55	0.11	0.74	0.14*	3.02	0.00	3.02
7.60	0.11	0.74	0.14*	3.00	0.00	3.00
7.65	0.11	0.74	0.14*	2.97	0.00	2.97
7.70	0.11	0.74	0.14*	2.95	0.00	2.95
7.75	0.11	0.74	0.14*	2.93	0.00	2.93
7.80	0.11	0.74	0.14*	2.90	0.00	2.90
7.85	0.11	0.74	0.14*	2.88	0.00	2.88
7.90	0.11	0.74	0.14*	2.86	0.00	2.86
7.95	0.11	0.74	0.14*	2.83	0.00	2.83
8.00	0.11	0.74	0.14*	2.81	0.00	2.81
8.05	0.11	0.74	0.14*	2.79	0.00	2.79
8.10	0.10	0.74	0.14*	2.76	0.00	2.76
8.15	0.10	0.74	0.14*	2.74	0.00	2.74
8.20	0.10	0.74	0.14*	2.72	0.00	2.72
8.25	0.12	0.74	0.16*	2.69	0.00	2.69
8.30	0.12	0.74	0.16*	2.67	0.00	2.67
8.35	0.12	0.74	0.16*	2.65	0.00	2.65
8.40	0.12	0.74	0.16*	2.63	0.00	2.63
8.45	0.12	0.74	0.16*	2.61	0.00	2.61
8.50	0.12	0.74	0.16*	2.58	0.00	2.58
8.55	0.12	0.74	0.16*	2.56	0.00	2.56
8.60	0.12	0.74	0.16*	2.54	0.00	2.54
8.65	0.12	0.74	0.16*	2.52	0.00	2.52
8.70	0.12	0.74	0.16*	2.50	0.00	2.50
8.75	0.12	0.74	0.16*	2.47	0.00	2.47
8.80	0.12	0.74	0.16*	2.45	0.00	2.45
8.85	0.12	0.74	0.16*	2.43	0.00	2.43
8.90	0.12	0.74	0.17*	2.41	0.00	2.41
8.95	0.12	0.74	0.17*	2.39	0.00	2.39
9.00	0.12	0.74	0.17*	2.37	0.00	2.37
9.05	0.13	0.74	0.17*	2.35	0.00	2.35
9.10	0.13	0.74	0.17*	2.33	0.00	2.33
9.15	0.13	0.74	0.18*	2.31	0.00	2.31
9.20	0.13	0.74	0.18*	2.29	0.00	2.29
9.25	0.13	0.74	0.18*	2.27	0.00	2.27
9.30	0.14	0.74	0.18*	2.25	0.00	2.25
9.35	0.14	0.74	0.19*	2.23	0.00	2.23
9.40	0.14	0.74	0.19*	2.21	0.00	2.21
9.45	0.14	0.74	0.19*	2.19	0.00	2.19
9.50	0.14	0.74	0.19*	2.17	0.00	2.17

9.55	0.15	0.74	0.20*	2.15	0.00	2.15
9.60	0.15	0.74	0.20*	2.13	0.00	2.13
9.65	0.15	0.74	0.20*	2.11	0.00	2.11
9.70	0.15	0.74	0.20*	2.09	0.00	2.09
9.75	0.15	0.74	0.21*	2.07	0.00	2.07
9.80	0.15	0.74	0.21*	2.05	0.00	2.05
9.85	0.16	0.74	0.21*	2.03	0.00	2.03
9.90	0.16	0.74	0.21*	2.02	0.00	2.02
9.95	0.16	0.74	0.22*	2.00	0.00	2.00
10.00	0.16	0.74	0.22*	1.98	0.00	1.98
10.05	0.16	0.74	0.22*	1.96	0.00	1.96
10.10	0.17	0.74	0.22*	1.94	0.00	1.94
10.15	0.17	0.74	0.23*	1.93	0.00	1.93
10.20	0.17	0.74	0.23*	1.91	0.00	1.91
10.25	0.17	0.74	0.23*	1.89	0.00	1.89
10.30	0.17	0.74	0.23*	1.87	0.00	1.87
10.35	0.17	0.74	0.24*	1.86	0.00	1.86
10.40	0.18	0.74	0.24*	1.84	0.00	1.84
10.45	0.18	0.74	0.24*	1.82	0.00	1.82
10.50	0.18	0.74	0.24*	1.81	0.00	1.81
10.55	0.18	0.74	0.25*	1.79	0.00	1.79
10.60	0.18	0.74	0.25*	1.77	0.00	1.77
10.65	0.18	0.74	0.25*	1.76	0.00	1.76
10.70	0.19	0.74	0.25*	1.74	0.00	1.74
10.75	0.19	0.74	0.25*	1.72	0.00	1.72
10.80	0.19	0.74	0.26*	1.71	0.00	1.71
10.85	0.19	0.74	0.26*	1.69	0.00	1.69
10.90	0.19	0.74	0.26*	1.67	0.00	1.67
10.95	0.19	0.74	0.26*	1.66	0.00	1.66
11.00	0.20	0.74	0.27*	1.64	0.00	1.64
11.05	0.19	0.74	0.26*	1.63	0.00	1.63
11.10	0.19	0.74	0.26*	1.61	0.00	1.61
11.15	0.19	0.74	0.26*	1.59	0.00	1.59
11.20	0.19	0.74	0.26*	1.58	0.00	1.58
11.25	0.19	0.74	0.26*	1.56	0.00	1.56
11.30	0.19	0.74	0.26*	1.55	0.00	1.55
11.35	0.19	0.74	0.25*	1.53	0.00	1.53
11.40	0.19	0.74	0.25*	1.51	0.00	1.51
11.45	0.18	0.74	0.25*	1.50	0.00	1.50
11.50	0.18	0.73	0.25*	1.48	0.00	1.48
11.55	0.18	0.73	0.25*	1.46	0.00	1.46
11.60	0.18	0.73	0.25*	1.45	0.00	1.45
11.65	0.18	0.73	0.24*	1.43	0.00	1.43
11.70	0.18	0.73	0.24*	1.41	0.00	1.41
11.75	0.18	0.73	0.24*	1.40	0.00	1.40
11.80	0.18	0.73	0.24*	1.38	0.00	1.38
11.85	0.17	0.73	0.24*	1.36	0.00	1.36
11.90	0.17	0.73	0.24*	1.35	0.00	1.35
11.95	0.17	0.73	0.24*	1.33	0.00	1.33
12.00	0.17	0.73	0.24*	1.31	0.00	1.31
12.05	0.17	0.73	0.23*	1.29	0.00	1.29
12.10	0.17	0.73	0.23*	1.28	0.00	1.28
12.15	0.17	0.73	0.23*	1.26	0.00	1.26
12.20	0.17	0.73	0.23*	1.24	0.00	1.24
12.25	0.17	0.73	0.23*	1.22	0.00	1.22
12.30	0.17	0.73	0.23*	1.21	0.00	1.21
12.35	0.17	0.73	0.23*	1.19	0.00	1.19
12.40	0.17	0.73	0.23*	1.17	0.00	1.17
12.45	0.17	0.73	0.23*	1.15	0.00	1.15
12.50	0.17	0.73	0.23*	1.14	0.00	1.14
12.55	0.17	0.73	0.23*	1.12	0.00	1.12
12.60	0.16	0.73	0.23*	1.10	0.00	1.10
12.65	0.16	0.73	0.22*	1.08	0.00	1.08
12.70	0.16	0.73	0.22*	1.07	0.00	1.07
12.75	0.16	0.73	0.22*	1.05	0.00	1.05
12.80	0.16	0.73	0.22*	1.03	0.00	1.03
12.85	0.16	0.73	0.22*	1.01	0.00	1.01
12.90	0.16	0.73	0.22*	0.99	0.00	0.99
12.95	0.16	0.73	0.22*	0.98	0.00	0.98
13.00	0.16	0.73	0.22*	0.96	0.00	0.96
13.05	0.17	0.73	0.23*	0.94	0.00	0.94
13.10	0.18	0.73	0.24*	0.92	0.00	0.92
13.15	0.19	0.73	0.26*	0.91	0.00	0.91
13.20	0.20	0.73	0.27*	0.89	0.00	0.89
13.25	0.21	0.73	0.28*	0.87	0.00	0.87
13.30	0.22	0.73	0.30*	0.86	0.00	0.86
13.35	0.23	0.73	0.31*	0.84	0.00	0.84
13.40	0.23	0.73	0.32*	0.83	0.00	0.83
13.45	0.24	0.73	0.33*	0.82	0.00	0.82
13.50	0.25	0.73	0.35*	0.80	0.00	0.80
13.55	0.26	0.73	0.36*	0.79	0.00	0.79
13.60	0.27	0.73	0.38*	0.78	0.00	0.78
13.65	0.28	0.73	0.39*	0.76	0.00	0.76
13.70	0.30	0.73	0.41*	0.75	0.00	0.75
13.75	0.31	0.73	0.42*	0.74	0.00	0.74
13.80	0.32	0.73	0.44*	0.73	0.00	0.73
13.85	0.34	0.73	0.46*	0.72	0.00	0.72
13.90	0.35	0.73	0.48*	0.71	0.00	0.71
13.95	0.37	0.73	0.50*	0.70	0.00	0.70
14.00	0.39	0.73	0.53*	0.69	0.00	0.69
14.05	0.41	0.73	0.56*	0.68	0.00	0.68
14.10	0.44	0.73	0.60*	0.67	0.00	0.67
14.15	0.50	0.73	0.69*	0.67	0.00	0.67
14.20	2.30	0.73	3.15	0.66	0.00	0.66
14.25	2.30	0.73	3.15	0.66	0.00	0.66
14.30	2.30	0.73	3.15	0.66	0.00	0.66
14.35	2.30	0.73	3.16	0.66	0.00	0.66
14.40	2.30	0.73	3.16	0.66	0.00	0.66
14.45	2.30	0.73	3.16	0.66	0.00	0.66
14.50	2.30	0.73	3.16	0.66	0.00	0.66
14.55	2.30	0.73	3.16	0.66	0.00	0.66
14.60	2.30	0.73	3.16	0.66	0.00	0.66
14.65	2.30	0.73	3.16	0.66	0.00	0.66
14.70	2.30	0.73	3.16	0.66	0.00	0.66
14.75	2.30	0.73	3.16	0.66	0.00	0.66
14.80	2.30	0.73	3.16	0.66	0.00	0.66
14.85	2.30	0.73	3.16	0.66	0.00	0.66
14.90	2.30	0.73	3.16	0.66	0.00	0.66
14.95	2.30	0.73	3.16	0.66	0.00	0.66
15.00	2.30	0.73	3.16	0.66	0.00	0.66
15.05	2.30	0.73	3.16	0.66	0.00	0.66
15.10	2.30	0.73	3.16	0.66	0.00	0.66
15.15	2.30	0.73	3.16	0.66	0.00	0.66
15.20	2.30	0.73	3.16	0.66	0.00	0.66
15.25	2.30	0.73	3.16	0.66	0.00	0.66
15.30	2.30	0.73	3.16	0.66	0.00	0.66
15.35	2.30	0.73	3.16	0.66	0.00	0.66
15.40	2.30	0.73	3.16	0.66	0.00	0.66
15.45	2.30	0.73	3.16	0.66	0.00	0.66
15.50	2.30	0.73	3.16	0.66	0.00	0.66
15.55	2.30	0.73	3.17	0.66	0.00	0.66
15.60	2.30	0.73	3.17	0.66	0.00	0.66
15.65	2.30	0.73	3.17	0.66	0.00	0.66
15.70	2.30	0.73	3.17	0.66	0.00	0.66
15.75	2.30	0.73	3.17	0.66	0.00	0.66
15.80	2.30	0.73	3.17	0.66	0.00	0.66
15.85	2.30	0.73	3.17	0.66	0.00	0.66
15.90	2.30	0.73	3.17	0.66	0.00	0.66
15.95	2.30	0.73	3.17	0.66	0.00	0.66
16.00	2.30	0.73	3.17	0.66	0.00	0.66
16.05	2.30	0.73	3.17	0.66	0.00	0.66
16.10	2.30	0.73	3.17	0.66	0.00	0.66
16.15	2.30	0.73	3.17	0.66	0.00	0.66
16.20	2.30	0.73	3.17	0.66	0.00	0.66
16.25	2.30	0.73	3.17	0.66	0.00	0.66
16.30	2.30	0.73	3.17	0.66	0.00	0.66
16.35	2.30	0.73	3.17	0.66	0.00	0.66
16.40	2.30	0.73	3.17	0.66	0.00	0.66

16.45	2.30	0.72	3.17	0.66	0.00	0.66
16.50	2.30	0.72	3.17	0.66	0.00	0.66
16.55	2.30	0.72	3.17	0.66	0.00	0.66
16.60	2.30	0.72	3.17	0.66	0.00	0.66
16.65	2.30	0.72	3.17	0.66	0.00	0.66
16.70	2.30	0.72	3.18	0.66	0.00	0.66
16.75	2.30	0.72	3.18	0.66	0.00	0.66
16.80	2.30	0.72	3.18	0.66	0.00	0.66
16.85	2.30	0.72	3.18	0.66	0.00	0.66
16.90	2.30	0.72	3.18	0.66	0.00	0.66
16.95	2.30	0.72	3.18	0.66	0.00	0.66
17.00	2.00	0.72	5.00	0.66	0.00	0.66
17.05	2.00	0.72	5.00	0.66	0.00	0.66
17.10	2.00	0.72	5.00	0.66	0.00	0.66
17.15	2.00	0.72	5.00	0.66	0.00	0.66
17.20	2.00	0.72	5.00	0.66	0.00	0.66
17.25	2.00	0.72	5.00	0.66	0.00	0.66
17.30	2.00	0.72	5.00	0.66	0.00	0.66
17.35	2.00	0.72	5.00	0.66	0.00	0.66
17.40	2.00	0.72	5.00	0.66	0.00	0.66
17.45	2.00	0.72	5.00	0.66	0.00	0.66
17.50	2.00	0.72	5.00	0.66	0.00	0.66
17.55	2.00	0.72	5.00	0.66	0.00	0.66
17.60	2.00	0.72	5.00	0.66	0.00	0.66
17.65	2.00	0.72	5.00	0.66	0.00	0.66
17.70	2.00	0.72	5.00	0.66	0.00	0.66
17.75	2.00	0.72	5.00	0.66	0.00	0.66
17.80	2.00	0.72	5.00	0.66	0.00	0.66
17.85	2.00	0.72	5.00	0.66	0.00	0.66
17.90	2.00	0.72	5.00	0.66	0.00	0.66
17.95	2.00	0.72	5.00	0.66	0.00	0.66
18.00	2.00	0.72	5.00	0.66	0.00	0.66
18.05	2.00	0.72	5.00	0.66	0.00	0.66
18.10	2.00	0.72	5.00	0.66	0.00	0.66
18.15	2.00	0.72	5.00	0.66	0.00	0.66
18.20	2.00	0.72	5.00	0.66	0.00	0.66
18.25	2.00	0.72	5.00	0.66	0.00	0.66
18.30	2.00	0.72	5.00	0.66	0.00	0.66
18.35	2.00	0.72	5.00	0.66	0.00	0.66
18.40	2.00	0.72	5.00	0.66	0.00	0.66
18.45	2.00	0.72	5.00	0.66	0.00	0.66
18.50	2.00	0.72	5.00	0.66	0.00	0.66
18.55	2.00	0.72	5.00	0.66	0.00	0.66
18.60	2.00	0.72	5.00	0.66	0.00	0.66
18.65	2.00	0.72	5.00	0.66	0.00	0.66
18.70	2.00	0.72	5.00	0.66	0.00	0.66
18.75	2.00	0.72	5.00	0.66	0.00	0.66
18.80	2.00	0.72	5.00	0.66	0.00	0.66
18.85	2.00	0.72	5.00	0.66	0.00	0.66
18.90	2.00	0.72	5.00	0.66	0.00	0.66
18.95	2.00	0.72	5.00	0.66	0.00	0.66
19.00	2.00	0.72	5.00	0.66	0.00	0.66
19.05	2.00	0.72	5.00	0.66	0.00	0.66
19.10	2.00	0.72	5.00	0.66	0.00	0.66
19.15	2.00	0.72	5.00	0.66	0.00	0.66
19.20	2.00	0.72	5.00	0.66	0.00	0.66
19.25	2.00	0.72	5.00	0.66	0.00	0.66
19.30	2.00	0.72	5.00	0.66	0.00	0.66
19.35	2.00	0.72	5.00	0.66	0.00	0.66
19.40	2.00	0.72	5.00	0.66	0.00	0.66
19.45	2.00	0.72	5.00	0.66	0.00	0.66
19.50	2.00	0.72	5.00	0.66	0.00	0.66
19.55	2.00	0.72	5.00	0.66	0.00	0.66
19.60	2.00	0.72	5.00	0.66	0.00	0.66
19.65	2.00	0.72	5.00	0.66	0.00	0.66
19.70	2.00	0.72	5.00	0.66	0.00	0.66
19.75	2.00	0.72	5.00	0.66	0.00	0.66
19.80	2.00	0.72	5.00	0.66	0.00	0.66
19.85	2.00	0.72	5.00	0.66	0.00	0.66

19.90	2.00	0.72	5.00	0.66	0.00	0.66
19.95	2.00	0.72	5.00	0.66	0.00	0.66
20.00	2.00	0.72	5.00	0.66	0.00	0.66
20.05	2.00	0.72	5.00	0.66	0.00	0.66
20.10	2.00	0.72	5.00	0.66	0.00	0.66
20.15	2.00	0.72	5.00	0.66	0.00	0.66
20.20	2.00	0.72	5.00	0.66	0.00	0.66
20.25	2.00	0.72	5.00	0.66	0.00	0.66
20.30	2.00	0.72	5.00	0.66	0.00	0.66
20.35	2.00	0.72	5.00	0.66	0.00	0.66
20.40	2.00	0.72	5.00	0.66	0.00	0.66
20.45	2.00	0.72	5.00	0.66	0.00	0.66
20.50	2.00	0.72	5.00	0.66	0.00	0.66
20.55	2.00	0.72	5.00	0.66	0.00	0.66
20.60	2.00	0.72	5.00	0.66	0.00	0.66
20.65	2.00	0.72	5.00	0.66	0.00	0.66
20.70	2.00	0.72	5.00	0.66	0.00	0.66
20.75	2.00	0.72	5.00	0.66	0.00	0.66
20.80	2.00	0.72	5.00	0.66	0.00	0.66
20.85	2.00	0.72	5.00	0.66	0.00	0.66
20.90	2.00	0.72	5.00	0.66	0.00	0.66
20.95	2.00	0.72	5.00	0.66	0.00	0.66
21.00	2.00	0.72	5.00	0.66	0.00	0.66
21.05	2.00	0.72	5.00	0.66	0.00	0.66
21.10	2.00	0.72	5.00	0.66	0.00	0.66
21.15	2.00	0.72	5.00	0.66	0.00	0.66
21.20	2.00	0.72	5.00	0.66	0.00	0.66
21.25	2.00	0.72	5.00	0.66	0.00	0.66
21.30	2.00	0.72	5.00	0.66	0.00	0.66
21.35	2.00	0.72	5.00	0.66	0.00	0.66
21.40	2.00	0.72	5.00	0.66	0.00	0.66
21.45	2.00	0.72	5.00	0.66	0.00	0.66
21.50	2.00	0.72	5.00	0.66	0.00	0.66
21.55	2.00	0.72	5.00	0.66	0.00	0.66
21.60	2.00	0.72	5.00	0.66	0.00	0.66
21.65	2.00	0.72	5.00	0.66	0.00	0.66
21.70	2.00	0.72	5.00	0.66	0.00	0.66
21.75	2.00	0.72	5.00	0.66	0.00	0.66
21.80	2.00	0.71	5.00	0.66	0.00	0.66
21.85	2.00	0.71	5.00	0.66	0.00	0.66
21.90	2.00	0.71	5.00	0.66	0.00	0.66
21.95	2.00	0.71	5.00	0.66	0.00	0.66
22.00	2.00	0.71	5.00	0.66	0.00	0.66
22.05	2.00	0.71	5.00	0.66	0.00	0.66
22.10	2.00	0.71	5.00	0.66	0.00	0.66
22.15	2.00	0.71	5.00	0.66	0.00	0.66
22.20	2.00	0.71	5.00	0.66	0.00	0.66
22.25	2.00	0.71	5.00	0.66	0.00	0.66
22.30	2.00	0.71	5.00	0.66	0.00	0.66
22.35	2.00	0.71	5.00	0.66	0.00	0.66
22.40	2.00	0.71	5.00	0.66	0.00	0.66
22.45	2.00	0.71	5.00	0.66	0.00	0.66
22.50	2.00	0.71	5.00	0.66	0.00	0.66
22.55	2.00	0.71	5.00	0.66	0.00	0.66
22.60	2.00	0.71	5.00	0.66	0.00	0.66
22.65	2.00	0.71	5.00	0.66	0.00	0.66
22.70	2.00	0.71	5.00	0.66	0.00	0.66
22.75	2.00	0.71	5.00	0.66	0.00	0.66
22.80	2.00	0.71	5.00	0.66	0.00	0.66
22.85	2.00	0.71	5.00	0.66	0.00	0.66
22.90	2.00	0.71	5.00	0.66	0.00	0.66
22.95	2.00	0.71	5.00	0.66	0.00	0.66
23.00	2.00	0.71	5.00	0.66	0.00	0.66
23.05	2.00	0.71	5.00	0.66	0.00	0.66
23.10	2.00	0.71	5.00	0.66	0.00	0.66
23.15	2.00	0.71	5.00	0.66	0.00	0.66
23.20	2.00	0.71	5.00	0.66	0.00	0.66
23.25	2.00	0.71	5.00	0.66	0.00	0.66
23.30	2.00	0.71	5.00	0.66	0.00	0.66

23.35	2.00	0.71	5.00	0.66	0.00	0.66
23.40	2.00	0.71	5.00	0.66	0.00	0.66
23.45	2.00	0.71	5.00	0.66	0.00	0.66
23.50	2.00	0.71	5.00	0.66	0.00	0.66
23.55	2.00	0.71	5.00	0.66	0.00	0.66
23.60	2.00	0.71	5.00	0.66	0.00	0.66
23.65	2.00	0.71	5.00	0.66	0.00	0.66
23.70	2.00	0.71	5.00	0.66	0.00	0.66
23.75	2.00	0.71	5.00	0.66	0.00	0.66
23.80	2.00	0.71	5.00	0.66	0.00	0.66
23.85	2.00	0.71	5.00	0.66	0.00	0.66
23.90	2.00	0.71	5.00	0.66	0.00	0.66
23.95	2.00	0.71	5.00	0.66	0.00	0.66
24.00	2.00	0.71	5.00	0.66	0.00	0.66
24.05	2.00	0.71	5.00	0.66	0.00	0.66
24.10	2.00	0.71	5.00	0.66	0.00	0.66
24.15	2.00	0.71	5.00	0.66	0.00	0.66
24.20	2.00	0.71	5.00	0.66	0.00	0.66
24.25	2.00	0.71	5.00	0.66	0.00	0.66
24.30	2.00	0.71	5.00	0.66	0.00	0.66
24.35	2.00	0.71	5.00	0.66	0.00	0.66
24.40	2.00	0.71	5.00	0.66	0.00	0.66
24.45	2.00	0.71	5.00	0.66	0.00	0.66
24.50	2.00	0.71	5.00	0.66	0.00	0.66
24.55	2.00	0.71	5.00	0.66	0.00	0.66
24.60	2.00	0.71	5.00	0.66	0.00	0.66
24.65	2.00	0.71	5.00	0.66	0.00	0.66
24.70	2.00	0.71	5.00	0.66	0.00	0.66
24.75	2.00	0.71	5.00	0.66	0.00	0.66
24.80	2.00	0.71	5.00	0.66	0.00	0.66
24.85	2.00	0.71	5.00	0.66	0.00	0.66
24.90	2.00	0.71	5.00	0.66	0.00	0.66
24.95	2.00	0.71	5.00	0.66	0.00	0.66
25.00	2.00	0.71	5.00	0.66	0.00	0.66
25.05	2.00	0.71	5.00	0.66	0.00	0.66
25.10	2.00	0.71	5.00	0.66	0.00	0.66
25.15	2.00	0.71	5.00	0.66	0.00	0.66
25.20	2.00	0.71	5.00	0.66	0.00	0.66
25.25	2.00	0.71	5.00	0.66	0.00	0.66
25.30	2.00	0.71	5.00	0.66	0.00	0.66
25.35	2.00	0.71	5.00	0.66	0.00	0.66
25.40	2.00	0.71	5.00	0.66	0.00	0.66
25.45	2.00	0.71	5.00	0.66	0.00	0.66
25.50	2.00	0.71	5.00	0.66	0.00	0.66
25.55	2.00	0.71	5.00	0.66	0.00	0.66
25.60	2.00	0.71	5.00	0.66	0.00	0.66
25.65	2.00	0.71	5.00	0.66	0.00	0.66
25.70	2.00	0.71	5.00	0.66	0.00	0.66
25.75	2.00	0.71	5.00	0.66	0.00	0.66
25.80	2.00	0.71	5.00	0.66	0.00	0.66
25.85	2.00	0.71	5.00	0.66	0.00	0.66
25.90	2.00	0.71	5.00	0.66	0.00	0.66
25.95	2.00	0.71	5.00	0.66	0.00	0.66
26.00	2.00	0.71	5.00	0.66	0.00	0.66
26.05	2.00	0.71	5.00	0.66	0.00	0.66
26.10	2.00	0.71	5.00	0.66	0.00	0.66
26.15	2.00	0.71	5.00	0.66	0.00	0.66
26.20	2.00	0.71	5.00	0.66	0.00	0.66
26.25	2.00	0.71	5.00	0.66	0.00	0.66
26.30	2.00	0.71	5.00	0.66	0.00	0.66
26.35	2.00	0.71	5.00	0.66	0.00	0.66
26.40	2.00	0.71	5.00	0.66	0.00	0.66
26.45	2.00	0.71	5.00	0.66	0.00	0.66
26.50	2.00	0.71	5.00	0.66	0.00	0.66
26.55	2.00	0.71	5.00	0.66	0.00	0.66
26.60	2.00	0.71	5.00	0.66	0.00	0.66
26.65	2.00	0.71	5.00	0.66	0.00	0.66
26.70	2.00	0.71	5.00	0.66	0.00	0.66
26.75	2.00	0.71	5.00	0.66	0.00	0.66
26.80	2.00	0.71	5.00	0.66	0.00	0.66
26.85	2.00	0.71	5.00	0.66	0.00	0.66
26.90	2.00	0.71	5.00	0.66	0.00	0.66
26.95	2.00	0.71	5.00	0.66	0.00	0.66
27.00	2.00	0.71	5.00	0.66	0.00	0.66
27.05	0.18	0.71	0.26*	0.66	0.00	0.66
27.10	0.18	0.71	0.26*	0.64	0.00	0.64
27.15	0.18	0.71	0.26*	0.63	0.00	0.63
27.20	0.18	0.71	0.26*	0.61	0.00	0.61
27.25	0.18	0.70	0.26*	0.59	0.00	0.59
27.30	0.18	0.70	0.26*	0.58	0.00	0.58
27.35	0.18	0.70	0.26*	0.56	0.00	0.56
27.40	0.18	0.70	0.26*	0.54	0.00	0.54
27.45	0.18	0.70	0.26*	0.53	0.00	0.53
27.50	0.18	0.70	0.26*	0.51	0.00	0.51
27.55	0.18	0.70	0.26*	0.49	0.00	0.49
27.60	0.18	0.70	0.26*	0.48	0.00	0.48
27.65	0.18	0.70	0.26*	0.46	0.00	0.46
27.70	0.18	0.70	0.26*	0.44	0.00	0.44
27.75	0.18	0.70	0.26*	0.43	0.00	0.43
27.80	0.18	0.70	0.26*	0.41	0.00	0.41
27.85	0.18	0.70	0.26*	0.39	0.00	0.39
27.90	0.19	0.70	0.26*	0.38	0.00	0.38
27.95	0.19	0.70	0.26*	0.36	0.00	0.36
28.00	0.19	0.70	0.26*	0.34	0.00	0.34
28.05	0.19	0.70	0.26*	0.33	0.00	0.33
28.10	0.19	0.70	0.26*	0.31	0.00	0.31
28.15	0.19	0.70	0.26*	0.30	0.00	0.30
28.20	0.19	0.70	0.26*	0.28	0.00	0.28
28.25	0.19	0.70	0.26*	0.26	0.00	0.26
28.30	0.19	0.70	0.26*	0.25	0.00	0.25
28.35	0.19	0.70	0.26*	0.23	0.00	0.23
28.40	0.19	0.70	0.26*	0.21	0.00	0.21
28.45	0.19	0.70	0.26*	0.20	0.00	0.20
28.50	0.19	0.70	0.26*	0.18	0.00	0.18
28.55	0.19	0.70	0.26*	0.16	0.00	0.16
28.60	0.19	0.70	0.26*	0.15	0.00	0.15
28.65	0.19	0.70	0.26*	0.13	0.00	0.13
28.70	0.19	0.70	0.26*	0.12	0.00	0.12
28.75	0.19	0.70	0.26*	0.10	0.00	0.10
28.80	0.18	0.70	0.26*	0.08	0.00	0.08
28.85	0.18	0.70	0.26*	0.07	0.00	0.07
28.90	0.18	0.70	0.26*	0.05	0.00	0.05
28.95	0.18	0.70	0.26*	0.03	0.00	0.03
29.00	0.18	0.70	0.26*	0.02	0.00	0.02
29.05	2.00	0.70	5.00	0.00	0.00	0.00
29.10	2.00	0.70	5.00	0.00	0.00	0.00
29.15	2.00	0.70	5.00	0.00	0.00	0.00
29.20	2.00	0.70	5.00	0.00	0.00	0.00
29.25	2.00	0.70	5.00	0.00	0.00	0.00
29.30	2.00	0.70	5.00	0.00	0.00	0.00
29.35	2.00	0.70	5.00	0.00	0.00	0.00
29.40	2.00	0.70	5.00	0.00	0.00	0.00
29.45	2.00	0.70	5.00	0.00	0.00	0.00
29.50	2.00	0.70	5.00	0.00	0.00	0.00
29.55	2.00	0.70	5.00	0.00	0.00	0.00
29.60	2.00	0.70	5.00	0.00	0.00	0.00
29.65	2.00	0.70	5.00	0.00	0.00	0.00
29.70	2.00	0.70	5.00	0.00	0.00	0.00
29.75	2.00	0.70	5.00	0.00	0.00	0.00
29.80	2.00	0.70	5.00	0.00	0.00	0.00
29.85	2.00	0.70	5.00	0.00	0.00	0.00
29.90	2.00	0.70	5.00	0.00	0.00	0.00
29.95	2.00	0.70	5.00	0.00	0.00	0.00
30.00	2.00	0.70	5.00	0.00	0.00	0.00
30.05	2.00	0.70	5.00	0.00	0.00	0.00
30.10	2.00	0.70	5.00	0.00	0.00	0.00
30.15	2.00	0.70	5.00	0.00	0.00	0.00
30.20	2.00	0.70	5.00	0.00	0.00	0.00

30.25	2.00	0.70	5.00	0.00	0.00	0.00
30.30	2.00	0.70	5.00	0.00	0.00	0.00
30.35	2.00	0.70	5.00	0.00	0.00	0.00
30.40	2.00	0.70	5.00	0.00	0.00	0.00
30.45	2.00	0.70	5.00	0.00	0.00	0.00
30.50	2.00	0.70	5.00	0.00	0.00	0.00
30.55	2.00	0.70	5.00	0.00	0.00	0.00
30.60	2.00	0.70	5.00	0.00	0.00	0.00
30.65	2.00	0.70	5.00	0.00	0.00	0.00
30.70	2.00	0.70	5.00	0.00	0.00	0.00
30.75	2.00	0.70	5.00	0.00	0.00	0.00
30.80	2.00	0.69	5.00	0.00	0.00	0.00
30.85	2.00	0.69	5.00	0.00	0.00	0.00
30.90	2.00	0.69	5.00	0.00	0.00	0.00
30.95	2.00	0.69	5.00	0.00	0.00	0.00
31.00	2.00	0.69	5.00	0.00	0.00	0.00
31.05	2.00	0.69	5.00	0.00	0.00	0.00
31.10	2.00	0.69	5.00	0.00	0.00	0.00
31.15	2.00	0.69	5.00	0.00	0.00	0.00
31.20	2.00	0.69	5.00	0.00	0.00	0.00
31.25	2.00	0.69	5.00	0.00	0.00	0.00
31.30	2.00	0.69	5.00	0.00	0.00	0.00
31.35	2.00	0.69	5.00	0.00	0.00	0.00
31.40	2.00	0.69	5.00	0.00	0.00	0.00
31.45	2.00	0.69	5.00	0.00	0.00	0.00
31.50	2.00	0.69	5.00	0.00	0.00	0.00
31.55	2.00	0.69	5.00	0.00	0.00	0.00
31.60	2.00	0.69	5.00	0.00	0.00	0.00
31.65	2.00	0.69	5.00	0.00	0.00	0.00
31.70	2.00	0.69	5.00	0.00	0.00	0.00
31.75	2.00	0.69	5.00	0.00	0.00	0.00
31.80	2.00	0.69	5.00	0.00	0.00	0.00
31.85	2.00	0.69	5.00	0.00	0.00	0.00
31.90	2.00	0.69	5.00	0.00	0.00	0.00
31.95	2.00	0.69	5.00	0.00	0.00	0.00
32.00	2.00	0.69	5.00	0.00	0.00	0.00
32.05	2.00	0.69	5.00	0.00	0.00	0.00
32.10	2.00	0.69	5.00	0.00	0.00	0.00
32.15	2.00	0.69	5.00	0.00	0.00	0.00
32.20	2.00	0.69	5.00	0.00	0.00	0.00
32.25	2.00	0.69	5.00	0.00	0.00	0.00
32.30	2.00	0.69	5.00	0.00	0.00	0.00
32.35	2.00	0.69	5.00	0.00	0.00	0.00
32.40	2.00	0.69	5.00	0.00	0.00	0.00
32.45	2.00	0.68	5.00	0.00	0.00	0.00
32.50	2.00	0.68	5.00	0.00	0.00	0.00
32.55	2.00	0.68	5.00	0.00	0.00	0.00
32.60	2.00	0.68	5.00	0.00	0.00	0.00
32.65	2.00	0.68	5.00	0.00	0.00	0.00
32.70	2.00	0.68	5.00	0.00	0.00	0.00
32.75	2.00	0.68	5.00	0.00	0.00	0.00
32.80	2.00	0.68	5.00	0.00	0.00	0.00
32.85	2.00	0.68	5.00	0.00	0.00	0.00
32.90	2.00	0.68	5.00	0.00	0.00	0.00
32.95	2.00	0.68	5.00	0.00	0.00	0.00
33.00	2.00	0.68	5.00	0.00	0.00	0.00
33.05	2.00	0.68	5.00	0.00	0.00	0.00
33.10	2.00	0.68	5.00	0.00	0.00	0.00
33.15	2.00	0.68	5.00	0.00	0.00	0.00
33.20	2.00	0.68	5.00	0.00	0.00	0.00
33.25	2.00	0.68	5.00	0.00	0.00	0.00
33.30	2.00	0.68	5.00	0.00	0.00	0.00
33.35	2.00	0.68	5.00	0.00	0.00	0.00
33.40	2.00	0.68	5.00	0.00	0.00	0.00
33.45	2.00	0.68	5.00	0.00	0.00	0.00
33.50	2.00	0.68	5.00	0.00	0.00	0.00
33.55	2.00	0.68	5.00	0.00	0.00	0.00
33.60	2.00	0.68	5.00	0.00	0.00	0.00
33.65	2.00	0.68	5.00	0.00	0.00	0.00
33.70	2.00	0.68	5.00	0.00	0.00	0.00
33.75	2.00	0.68	5.00	0.00	0.00	0.00
33.80	2.00	0.68	5.00	0.00	0.00	0.00
33.85	2.00	0.68	5.00	0.00	0.00	0.00
33.90	2.00	0.68	5.00	0.00	0.00	0.00
33.95	2.00	0.68	5.00	0.00	0.00	0.00
34.00	2.00	0.68	5.00	0.00	0.00	0.00
34.05	2.00	0.67	5.00	0.00	0.00	0.00
34.10	2.00	0.67	5.00	0.00	0.00	0.00
34.15	2.00	0.67	5.00	0.00	0.00	0.00
34.20	2.00	0.67	5.00	0.00	0.00	0.00
34.25	2.00	0.67	5.00	0.00	0.00	0.00
34.30	2.00	0.67	5.00	0.00	0.00	0.00
34.35	2.00	0.67	5.00	0.00	0.00	0.00
34.40	2.00	0.67	5.00	0.00	0.00	0.00
34.45	2.00	0.67	5.00	0.00	0.00	0.00
34.50	2.00	0.67	5.00	0.00	0.00	0.00
34.55	2.00	0.67	5.00	0.00	0.00	0.00
34.60	2.00	0.67	5.00	0.00	0.00	0.00
34.65	2.00	0.67	5.00	0.00	0.00	0.00
34.70	2.00	0.67	5.00	0.00	0.00	0.00
34.75	2.00	0.67	5.00	0.00	0.00	0.00
34.80	2.00	0.67	5.00	0.00	0.00	0.00
34.85	2.00	0.67	5.00	0.00	0.00	0.00
34.90	2.00	0.67	5.00	0.00	0.00	0.00
34.95	2.00	0.67	5.00	0.00	0.00	0.00
35.00	2.00	0.67	5.00	0.00	0.00	0.00
35.05	2.00	0.67	5.00	0.00	0.00	0.00
35.10	2.00	0.67	5.00	0.00	0.00	0.00
35.15	2.00	0.67	5.00	0.00	0.00	0.00
35.20	2.00	0.67	5.00	0.00	0.00	0.00
35.25	2.00	0.67	5.00	0.00	0.00	0.00
35.30	2.00	0.67	5.00	0.00	0.00	0.00
35.35	2.00	0.67	5.00	0.00	0.00	0.00
35.40	2.00	0.67	5.00	0.00	0.00	0.00
35.45	2.00	0.67	5.00	0.00	0.00	0.00
35.50	2.00	0.67	5.00	0.00	0.00	0.00
35.55	2.00	0.67	5.00	0.00	0.00	0.00
35.60	2.00	0.67	5.00	0.00	0.00	0.00
35.65	2.00	0.67	5.00	0.00	0.00	0.00
35.70	2.00	0.66	5.00	0.00	0.00	0.00
35.75	2.00	0.66	5.00	0.00	0.00	0.00
35.80	2.00	0.66	5.00	0.00	0.00	0.00
35.85	2.00	0.66	5.00	0.00	0.00	0.00
35.90	2.00	0.66	5.00	0.00	0.00	0.00
35.95	2.00	0.66	5.00	0.00	0.00	0.00
36.00	2.00	0.66	5.00	0.00	0.00	0.00
36.05	2.00	0.66	5.00	0.00	0.00	0.00
36.10	2.00	0.66	5.00	0.00	0.00	0.00
36.15	2.00	0.66	5.00	0.00	0.00	0.00
36.20	2.00	0.66	5.00	0.00	0.00	0.00
36.25	2.00	0.66	5.00	0.00	0.00	0.00
36.30	2.00	0.66	5.00	0.00	0.00	0.00
36.35	2.00	0.66	5.00	0.00	0.00	0.00
36.40	2.00	0.66	5.00	0.00	0.00	0.00
36.45	2.00	0.66	5.00	0.00	0.00	0.00
36.50	2.00	0.66	5.00	0.00	0.00	0.00
36.55	2.00	0.66	5.00	0.00	0.00	0.00
36.60	2.00	0.66	5.00	0.00	0.00	0.00
36.65	2.00	0.66	5.00	0.00	0.00	0.00
36.70	2.00	0.66	5.00	0.00	0.00	0.00
36.75	2.00	0.66	5.00	0.00	0.00	0.00
36.80	2.00	0.66	5.00	0.00	0.00	0.00
36.85	2.00	0.66	5.00	0.00	0.00	0.00
36.90	2.00	0.66	5.00	0.00	0.00	0.00
36.95	2.00	0.66	5.00	0.00	0.00	0.00
37.00	2.00	0.66	5.00	0.00	0.00	0.00
37.05	2.00	0.66	5.00	0.00	0.00	0.00
37.10	2.00	0.66	5.00	0.00	0.00	0.00

37.15	2.00	0.66	5.00	0.00	0.00	0.00
37.20	2.00	0.66	5.00	0.00	0.00	0.00
37.25	2.00	0.66	5.00	0.00	0.00	0.00
37.30	2.00	0.65	5.00	0.00	0.00	0.00
37.35	2.00	0.65	5.00	0.00	0.00	0.00
37.40	2.00	0.65	5.00	0.00	0.00	0.00
37.45	2.00	0.65	5.00	0.00	0.00	0.00
37.50	2.00	0.65	5.00	0.00	0.00	0.00
37.55	2.00	0.65	5.00	0.00	0.00	0.00
37.60	2.00	0.65	5.00	0.00	0.00	0.00
37.65	2.00	0.65	5.00	0.00	0.00	0.00
37.70	2.00	0.65	5.00	0.00	0.00	0.00
37.75	2.00	0.65	5.00	0.00	0.00	0.00
37.80	2.00	0.65	5.00	0.00	0.00	0.00
37.85	2.00	0.65	5.00	0.00	0.00	0.00
37.90	2.00	0.65	5.00	0.00	0.00	0.00
37.95	2.00	0.65	5.00	0.00	0.00	0.00
38.00	2.00	0.65	5.00	0.00	0.00	0.00
38.05	2.00	0.65	5.00	0.00	0.00	0.00
38.10	2.00	0.65	5.00	0.00	0.00	0.00
38.15	2.00	0.65	5.00	0.00	0.00	0.00
38.20	2.00	0.65	5.00	0.00	0.00	0.00
38.25	2.00	0.65	5.00	0.00	0.00	0.00
38.30	2.00	0.65	5.00	0.00	0.00	0.00
38.35	2.00	0.65	5.00	0.00	0.00	0.00
38.40	2.00	0.65	5.00	0.00	0.00	0.00
38.45	2.00	0.65	5.00	0.00	0.00	0.00
38.50	2.00	0.65	5.00	0.00	0.00	0.00
38.55	2.00	0.65	5.00	0.00	0.00	0.00
38.60	2.00	0.65	5.00	0.00	0.00	0.00
38.65	2.00	0.65	5.00	0.00	0.00	0.00
38.70	2.00	0.65	5.00	0.00	0.00	0.00
38.75	2.00	0.64	5.00	0.00	0.00	0.00
38.80	2.00	0.64	5.00	0.00	0.00	0.00
38.85	2.00	0.64	5.00	0.00	0.00	0.00
38.90	2.00	0.64	5.00	0.00	0.00	0.00
38.95	2.00	0.64	5.00	0.00	0.00	0.00
39.00	2.00	0.64	5.00	0.00	0.00	0.00
39.05	2.00	0.64	5.00	0.00	0.00	0.00
39.10	2.00	0.64	5.00	0.00	0.00	0.00
39.15	2.00	0.64	5.00	0.00	0.00	0.00
39.20	2.00	0.64	5.00	0.00	0.00	0.00
39.25	2.00	0.64	5.00	0.00	0.00	0.00
39.30	2.00	0.64	5.00	0.00	0.00	0.00
39.35	2.00	0.64	5.00	0.00	0.00	0.00
39.40	2.00	0.64	5.00	0.00	0.00	0.00
39.45	2.00	0.64	5.00	0.00	0.00	0.00
39.50	2.00	0.64	5.00	0.00	0.00	0.00
39.55	2.00	0.64	5.00	0.00	0.00	0.00
39.60	2.00	0.64	5.00	0.00	0.00	0.00
39.65	2.00	0.64	5.00	0.00	0.00	0.00
39.70	2.00	0.64	5.00	0.00	0.00	0.00
39.75	2.00	0.64	5.00	0.00	0.00	0.00
39.80	2.00	0.64	5.00	0.00	0.00	0.00
39.85	2.00	0.64	5.00	0.00	0.00	0.00
39.90	2.00	0.64	5.00	0.00	0.00	0.00
39.95	2.00	0.64	5.00	0.00	0.00	0.00
40.00	2.00	0.64	5.00	0.00	0.00	0.00
40.05	2.30	0.64	3.62	0.00	0.00	0.00
40.10	2.30	0.63	3.62	0.00	0.00	0.00
40.15	2.30	0.63	3.63	0.00	0.00	0.00
40.20	2.30	0.63	3.63	0.00	0.00	0.00
40.25	2.30	0.63	3.63	0.00	0.00	0.00
40.30	2.30	0.63	3.63	0.00	0.00	0.00
40.35	2.30	0.63	3.64	0.00	0.00	0.00
40.40	2.30	0.63	3.64	0.00	0.00	0.00
40.45	2.30	0.63	3.64	0.00	0.00	0.00
40.50	2.30	0.63	3.64	0.00	0.00	0.00
40.55	2.30	0.63	3.64	0.00	0.00	0.00
40.60	2.30	0.63	3.65	0.00	0.00	0.00
40.65	2.30	0.63	3.65	0.00	0.00	0.00
40.70	2.30	0.63	3.65	0.00	0.00	0.00
40.75	2.30	0.63	3.65	0.00	0.00	0.00
40.80	2.30	0.63	3.66	0.00	0.00	0.00
40.85	2.30	0.63	3.66	0.00	0.00	0.00
40.90	2.30	0.63	3.66	0.00	0.00	0.00
40.95	2.30	0.63	3.66	0.00	0.00	0.00
41.00	2.30	0.63	3.67	0.00	0.00	0.00
41.05	2.30	0.63	3.67	0.00	0.00	0.00
41.10	2.30	0.63	3.67	0.00	0.00	0.00
41.15	2.30	0.63	3.67	0.00	0.00	0.00
41.20	2.30	0.63	3.67	0.00	0.00	0.00
41.25	2.30	0.63	3.68	0.00	0.00	0.00
41.30	2.30	0.63	3.68	0.00	0.00	0.00
41.35	2.30	0.62	3.68	0.00	0.00	0.00
41.40	2.30	0.62	3.68	0.00	0.00	0.00
41.45	2.30	0.62	3.69	0.00	0.00	0.00
41.50	2.30	0.62	3.69	0.00	0.00	0.00
41.55	2.30	0.62	3.69	0.00	0.00	0.00
41.60	2.30	0.62	3.69	0.00	0.00	0.00
41.65	2.30	0.62	3.70	0.00	0.00	0.00
41.70	2.30	0.62	3.70	0.00	0.00	0.00
41.75	2.30	0.62	3.70	0.00	0.00	0.00
41.80	2.30	0.62	3.70	0.00	0.00	0.00
41.85	2.30	0.62	3.70	0.00	0.00	0.00
41.90	2.30	0.62	3.71	0.00	0.00	0.00
41.95	2.30	0.62	3.71	0.00	0.00	0.00
42.00	2.30	0.62	3.71	0.00	0.00	0.00
42.05	2.30	0.62	3.71	0.00	0.00	0.00
42.10	2.30	0.62	3.72	0.00	0.00	0.00
42.15	2.30	0.62	3.72	0.00	0.00	0.00
42.20	2.30	0.62	3.72	0.00	0.00	0.00
42.25	2.30	0.62	3.72	0.00	0.00	0.00
42.30	2.30	0.62	3.72	0.00	0.00	0.00
42.35	2.30	0.62	3.73	0.00	0.00	0.00
42.40	2.30	0.62	3.73	0.00	0.00	0.00
42.45	2.30	0.62	3.73	0.00	0.00	0.00
42.50	2.30	0.62	3.73	0.00	0.00	0.00
42.55	2.30	0.62	3.74	0.00	0.00	0.00
42.60	2.30	0.62	3.74	0.00	0.00	0.00
42.65	2.30	0.61	3.74	0.00	0.00	0.00
42.70	2.30	0.61	3.74	0.00	0.00	0.00
42.75	2.30	0.61	3.75	0.00	0.00	0.00
42.80	2.30	0.61	3.75	0.00	0.00	0.00
42.85	2.30	0.61	3.75	0.00	0.00	0.00
42.90	2.30	0.61	3.75	0.00	0.00	0.00
42.95	2.30	0.61	3.75	0.00	0.00	0.00
43.00	2.30	0.61	3.76	0.00	0.00	0.00
43.05	2.30	0.61	3.76	0.00	0.00	0.00
43.10	2.30	0.61	3.76	0.00	0.00	0.00
43.15	2.30	0.61	3.76	0.00	0.00	0.00
43.20	2.30	0.61	3.77	0.00	0.00	0.00
43.25	2.30	0.61	3.77	0.00	0.00	0.00
43.30	2.30	0.61	3.77	0.00	0.00	0.00
43.35	2.30	0.61	3.77	0.00	0.00	0.00
43.40	2.30	0.61	3.78	0.00	0.00	0.00
43.45	2.30	0.61	3.78	0.00	0.00	0.00
43.50	2.30	0.61	3.78	0.00	0.00	0.00
43.55	2.30	0.61	3.78	0.00	0.00	0.00
43.60	2.30	0.61	3.79	0.00	0.00	0.00
43.65	2.30	0.61	3.79	0.00	0.00	0.00
43.70	2.30	0.61	3.79	0.00	0.00	0.00
43.75	2.30	0.61	3.79	0.00	0.00	0.00
43.80	2.30	0.61	3.79	0.00	0.00	0.00
43.85	2.30	0.61	3.80	0.00	0.00	0.00
43.90	2.30	0.61	3.80	0.00	0.00	0.00
43.95	2.30	0.61	3.80	0.00	0.00	0.00
44.00	2.30	0.60	3.80	0.00	0.00	0.00

44.05	2.30	0.60	3.81	0.00	0.00	0.00
44.10	2.30	0.60	3.81	0.00	0.00	0.00
44.15	2.30	0.60	3.81	0.00	0.00	0.00
44.20	2.30	0.60	3.81	0.00	0.00	0.00
44.25	2.30	0.60	3.82	0.00	0.00	0.00
44.30	2.30	0.60	3.82	0.00	0.00	0.00
44.35	2.30	0.60	3.82	0.00	0.00	0.00
44.40	2.30	0.60	3.82	0.00	0.00	0.00
44.45	2.30	0.60	3.82	0.00	0.00	0.00
44.50	2.30	0.60	3.83	0.00	0.00	0.00
44.55	2.30	0.60	3.83	0.00	0.00	0.00
44.60	2.30	0.60	3.83	0.00	0.00	0.00
44.65	2.30	0.60	3.83	0.00	0.00	0.00
44.70	2.30	0.60	3.84	0.00	0.00	0.00
44.75	2.30	0.60	3.84	0.00	0.00	0.00
44.80	2.30	0.60	3.84	0.00	0.00	0.00
44.85	2.30	0.60	3.84	0.00	0.00	0.00
44.90	2.30	0.60	3.85	0.00	0.00	0.00
44.95	2.30	0.60	3.85	0.00	0.00	0.00
45.00	2.30	0.60	3.85	0.00	0.00	0.00
45.05	2.30	0.60	3.85	0.00	0.00	0.00
45.10	2.30	0.60	3.86	0.00	0.00	0.00
45.15	2.30	0.60	3.86	0.00	0.00	0.00
45.20	2.30	0.60	3.86	0.00	0.00	0.00
45.25	2.30	0.60	3.86	0.00	0.00	0.00
45.30	2.30	0.60	3.86	0.00	0.00	0.00
45.35	2.30	0.59	3.87	0.00	0.00	0.00
45.40	2.30	0.59	3.87	0.00	0.00	0.00
45.45	2.30	0.59	3.87	0.00	0.00	0.00
45.50	2.30	0.59	3.87	0.00	0.00	0.00
45.55	2.30	0.59	3.88	0.00	0.00	0.00
45.60	2.30	0.59	3.88	0.00	0.00	0.00
45.65	2.30	0.59	3.88	0.00	0.00	0.00
45.70	2.30	0.59	3.88	0.00	0.00	0.00
45.75	2.30	0.59	3.89	0.00	0.00	0.00
45.80	2.30	0.59	3.89	0.00	0.00	0.00
45.85	2.30	0.59	3.89	0.00	0.00	0.00
45.90	2.30	0.59	3.89	0.00	0.00	0.00
45.95	2.30	0.59	3.90	0.00	0.00	0.00
46.00	2.30	0.59	3.90	0.00	0.00	0.00
46.05	2.30	0.59	3.90	0.00	0.00	0.00
46.10	2.30	0.59	3.90	0.00	0.00	0.00
46.15	2.30	0.59	3.91	0.00	0.00	0.00
46.20	2.30	0.59	3.91	0.00	0.00	0.00
46.25	2.30	0.59	3.91	0.00	0.00	0.00
46.30	2.30	0.59	3.91	0.00	0.00	0.00
46.35	2.30	0.59	3.92	0.00	0.00	0.00
46.40	2.30	0.59	3.92	0.00	0.00	0.00
46.45	2.30	0.59	3.92	0.00	0.00	0.00
46.50	2.30	0.59	3.92	0.00	0.00	0.00
46.55	2.30	0.59	3.92	0.00	0.00	0.00
46.60	2.30	0.59	3.93	0.00	0.00	0.00
46.65	2.30	0.59	3.93	0.00	0.00	0.00
46.70	2.30	0.59	3.93	0.00	0.00	0.00
46.75	2.30	0.58	3.93	0.00	0.00	0.00
46.80	2.30	0.58	3.94	0.00	0.00	0.00
46.85	2.30	0.58	3.94	0.00	0.00	0.00
46.90	2.30	0.58	3.94	0.00	0.00	0.00
46.95	2.30	0.58	3.94	0.00	0.00	0.00
47.00	2.30	0.58	3.95	0.00	0.00	0.00
47.05	2.30	0.58	3.95	0.00	0.00	0.00
47.10	2.30	0.58	3.95	0.00	0.00	0.00
47.15	2.30	0.58	3.95	0.00	0.00	0.00
47.20	2.30	0.58	3.96	0.00	0.00	0.00
47.25	2.30	0.58	3.96	0.00	0.00	0.00
47.30	2.30	0.58	3.96	0.00	0.00	0.00
47.35	2.30	0.58	3.96	0.00	0.00	0.00
47.40	2.30	0.58	3.97	0.00	0.00	0.00
47.45	2.30	0.58	3.97	0.00	0.00	0.00
47.50	2.30	0.58	3.97	0.00	0.00	0.00
47.55	2.30	0.58	3.97	0.00	0.00	0.00
47.60	2.30	0.58	3.98	0.00	0.00	0.00
47.65	2.30	0.58	3.98	0.00	0.00	0.00
47.70	2.30	0.58	3.98	0.00	0.00	0.00
47.75	2.30	0.58	3.98	0.00	0.00	0.00
47.80	2.30	0.58	3.99	0.00	0.00	0.00
47.85	2.30	0.58	3.99	0.00	0.00	0.00
47.90	2.30	0.58	3.99	0.00	0.00	0.00
47.95	2.30	0.58	3.99	0.00	0.00	0.00
48.00	2.30	0.58	4.00	0.00	0.00	0.00
48.05	2.30	0.58	4.00	0.00	0.00	0.00
48.10	2.30	0.58	4.00	0.00	0.00	0.00
48.15	2.30	0.57	4.00	0.00	0.00	0.00
48.20	2.30	0.57	4.01	0.00	0.00	0.00
48.25	2.30	0.57	4.01	0.00	0.00	0.00
48.30	2.30	0.57	4.01	0.00	0.00	0.00
48.35	2.30	0.57	4.01	0.00	0.00	0.00
48.40	2.30	0.57	4.02	0.00	0.00	0.00
48.45	2.30	0.57	4.02	0.00	0.00	0.00
48.50	2.30	0.57	4.02	0.00	0.00	0.00
48.55	2.30	0.57	4.02	0.00	0.00	0.00
48.60	2.30	0.57	4.02	0.00	0.00	0.00
48.65	2.30	0.57	4.03	0.00	0.00	0.00
48.70	2.30	0.57	4.03	0.00	0.00	0.00
48.75	2.30	0.57	4.03	0.00	0.00	0.00
48.80	2.30	0.57	4.03	0.00	0.00	0.00
48.85	2.30	0.57	4.04	0.00	0.00	0.00
48.90	2.30	0.57	4.04	0.00	0.00	0.00
48.95	2.30	0.57	4.04	0.00	0.00	0.00
49.00	2.30	0.57	4.04	0.00	0.00	0.00
49.05	2.30	0.57	4.05	0.00	0.00	0.00
49.10	2.30	0.57	4.05	0.00	0.00	0.00
49.15	2.30	0.57	4.05	0.00	0.00	0.00
49.20	2.30	0.57	4.05	0.00	0.00	0.00
49.25	2.30	0.57	4.06	0.00	0.00	0.00
49.30	2.30	0.57	4.06	0.00	0.00	0.00
49.35	2.30	0.57	4.06	0.00	0.00	0.00
49.40	2.30	0.57	4.06	0.00	0.00	0.00
49.45	2.30	0.57	4.07	0.00	0.00	0.00
49.50	2.30	0.57	4.07	0.00	0.00	0.00
49.55	2.30	0.56	4.07	0.00	0.00	0.00
49.60	2.30	0.56	4.07	0.00	0.00	0.00
49.65	2.30	0.56	4.08	0.00	0.00	0.00
49.70	2.30	0.56	4.08	0.00	0.00	0.00
49.75	2.30	0.56	4.08	0.00	0.00	0.00
49.80	2.30	0.56	4.08	0.00	0.00	0.00
49.85	2.30	0.56	4.09	0.00	0.00	0.00
49.90	2.30	0.56	4.09	0.00	0.00	0.00
49.95	2.30	0.56	4.09	0.00	0.00	0.00
50.00	2.30	0.56	4.10	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Depth = ft, Stress or Pressure = tsf (atm), Unit Weight = pcf, Settlement = in.

CRRm	Cyclic resistance ratio from soils
CSRfs	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRfs
S_sat	Settlement from saturated sands
S_dry	Settlement from dry sands
S_all	Total settlement from saturated and dry sands
NoLiq	No-Liquefy Soils

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Input File Name: E:\VB&B\Woodfin\Boring 5.liq
Title: Woodfin Suites
Subtitle: B-5

Surface Elev.=8
Hole No.=B-5
Depth of Hole= 75.0 ft
Water Table during Earthquake= 3.0 ft
Water Table during In-Situ Testing= 11.0 ft
Max. Acceleration= 0.5 g
Earthquake Magnitude= 7.1

Input Data:

Surface Elev.=8
Hole No.=B-5
Depth of Hole=75.0 ft
Water Table during Earthquake= 3.0 ft
Water Table during In-Situ Testing= 11.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=7.1

Earthquake Magnitude=7.1
2. Settlement Analysis Method: Ishihara / Yoshimine*
3. Fines Correction for Liquefaction: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1
7. Borehole Diameter, Cb= 1.15
8. Sampeling Method, Cs= 1
9. User request factor of safty (apply to CSR) , User= 1.2
Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.0	4.0	100.0	NoLiq
6.0	4.0	100.0	NoLiq
7.0	4.0	110.0	3.0
10.0	4.0	110.0	3.0
11.0	4.0	110.0	3.0
12.0	11.0	110.0	12.0
14.0	6.0	110.0	12.0
16.0	6.0	110.0	12.0
18.0	6.0	110.0	NoLiq
20.0	6.0	110.0	NoLiq
25.0	6.0	110.0	NoLiq
28.0	3.0	110.0	32.0
30.0	3.0	110.0	32.0
31.0	8.0	110.0	32.0
33.0	9.0	110.0	10.0
38.0	26.0	120.0	12.0
42.0	26.0	120.0	12.0
45.0	28.0	120.0	6.0
50.0	65.0	120.0	12.0
55.0	30.0	120.0	12.0
60.0	66.0	120.0	12.0
64.0	35.0	120.0	10.0
65.0	35.0	120.0	10.0
70.0	25.0	120.0	10.0
74.0	27.0	120.0	45.0

Output Results:
Settlement of saturated sands=11.06 in.
Settlement of dry sands=0.00 in.
Total settlement of saturated and dry sands=11.06 in.
Differential Settlement=5.531 to 7.300 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.00	0.32	5.00	11.06	0.00	11.06
0.05	2.00	0.32	5.00	11.06	0.00	11.06
0.10	2.00	0.32	5.00	11.06	0.00	11.06
0.15	2.00	0.32	5.00	11.06	0.00	11.06
0.20	2.00	0.32	5.00	11.06	0.00	11.06
0.25	2.00	0.32	5.00	11.06	0.00	11.06
0.30	2.00	0.32	5.00	11.06	0.00	11.06
0.35	2.00	0.32	5.00	11.06	0.00	11.06
0.40	2.00	0.32	5.00	11.06	0.00	11.06
0.45	2.00	0.32	5.00	11.06	0.00	11.06
0.50	2.00	0.32	5.00	11.06	0.00	11.06
0.55	2.00	0.32	5.00	11.06	0.00	11.06
0.60	2.00	0.32	5.00	11.06	0.00	11.06
0.65	2.00	0.32	5.00	11.06	0.00	11.06
0.70	2.00	0.32	5.00	11.06	0.00	11.06
0.75	2.00	0.32	5.00	11.06	0.00	11.06
0.80	2.00	0.32	5.00	11.06	0.00	11.06
0.85	2.00	0.32	5.00	11.06	0.00	11.06
0.90	2.00	0.32	5.00	11.06	0.00	11.06
0.95	2.00	0.32	5.00	11.06	0.00	11.06
1.00	2.00	0.32	5.00	11.06	0.00	11.06
1.05	2.00	0.32	5.00	11.06	0.00	11.06
1.10	2.00	0.32	5.00	11.06	0.00	11.06
1.15	2.00	0.32	5.00	11.06	0.00	11.06
1.20	2.00	0.32	5.00	11.06	0.00	11.06
1.25	2.00	0.32	5.00	11.06	0.00	11.06
1.30	2.00	0.32	5.00	11.06	0.00	11.06
1.35	2.00	0.32	5.00	11.06	0.00	11.06
1.40	2.00	0.32	5.00	11.06	0.00	11.06
1.45	2.00	0.32	5.00	11.06	0.00	11.06
1.50	2.00	0.32	5.00	11.06	0.00	11.06
1.55	2.00	0.32	5.00	11.06	0.00	11.06
1.60	2.00	0.32	5.00	11.06	0.00	11.06
1.65	2.00	0.32	5.00	11.06	0.00	11.06
1.70	2.00	0.32	5.00	11.06	0.00	11.06
1.75	2.00	0.32	5.00	11.06	0.00	11.06
1.80	2.00	0.32	5.00	11.06	0.00	11.06
1.85	2.00	0.32	5.00	11.06	0.00	11.06
1.90	2.00	0.32	5.00	11.06	0.00	11.06
1.95	2.00	0.32	5.00	11.06	0.00	11.06
2.00	2.00	0.32	5.00	11.06	0.00	11.06
2.05	2.00	0.32	5.00	11.06	0.00	11.06
2.10	2.00	0.32	5.00	11.06	0.00	11.06
2.15	2.00	0.32	5.00	11.06	0.00	11.06
2.20	2.00	0.32	5.00	11.06	0.00	11.06
2.25	2.00	0.32	5.00	11.06	0.00	11.06
2.30	2.00	0.32	5.00	11.06	0.00	11.06
2.35	2.00	0.32	5.00	11.06	0.00	11.06
2.40	2.00	0.32	5.00	11.06	0.00	11.06
2.45	2.00	0.32	5.00	11.06	0.00	11.06
2.50	2.00	0.32	5.00	11.06	0.00	11.06

2.55	2.00	0.32	5.00	11.06	0.00	11.06
2.60	2.00	0.32	5.00	11.06	0.00	11.06
2.65	2.00	0.32	5.00	11.06	0.00	11.06
2.70	2.00	0.32	5.00	11.06	0.00	11.06
2.75	2.00	0.32	5.00	11.06	0.00	11.06
2.80	2.00	0.32	5.00	11.06	0.00	11.06
2.85	2.00	0.32	5.00	11.06	0.00	11.06
2.90	2.00	0.32	5.00	11.06	0.00	11.06
2.95	2.00	0.32	5.00	11.06	0.00	11.06
3.00	2.00	0.32	5.00	11.06	0.00	11.06
3.05	2.00	0.32	5.00	11.06	0.00	11.06
3.10	2.00	0.33	5.00	11.06	0.00	11.06
3.15	2.00	0.33	5.00	11.06	0.00	11.06
3.20	2.00	0.33	5.00	11.06	0.00	11.06
3.25	2.00	0.34	5.00	11.06	0.00	11.06
3.30	2.00	0.34	5.00	11.06	0.00	11.06
3.35	2.00	0.34	5.00	11.06	0.00	11.06
3.40	2.00	0.34	5.00	11.06	0.00	11.06
3.45	2.00	0.35	5.00	11.06	0.00	11.06
3.50	2.00	0.35	5.00	11.06	0.00	11.06
3.55	2.00	0.35	5.00	11.06	0.00	11.06
3.60	2.00	0.36	5.00	11.06	0.00	11.06
3.65	2.00	0.36	5.00	11.06	0.00	11.06
3.70	2.00	0.36	5.00	11.06	0.00	11.06
3.75	2.00	0.36	5.00	11.06	0.00	11.06
3.80	2.00	0.37	5.00	11.06	0.00	11.06
3.85	2.00	0.37	5.00	11.06	0.00	11.06
3.90	2.00	0.37	5.00	11.06	0.00	11.06
3.95	2.00	0.38	5.00	11.06	0.00	11.06
4.00	2.00	0.38	5.00	11.06	0.00	11.06
4.05	2.00	0.38	5.00	11.06	0.00	11.06
4.10	2.00	0.38	5.00	11.06	0.00	11.06
4.15	2.00	0.39	5.00	11.06	0.00	11.06
4.20	2.00	0.39	5.00	11.06	0.00	11.06
4.25	2.00	0.39	5.00	11.06	0.00	11.06
4.30	2.00	0.39	5.00	11.06	0.00	11.06
4.35	2.00	0.40	5.00	11.06	0.00	11.06
4.40	2.00	0.40	5.00	11.06	0.00	11.06
4.45	2.00	0.40	5.00	11.06	0.00	11.06
4.50	2.00	0.40	5.00	11.06	0.00	11.06
4.55	2.00	0.40	5.00	11.06	0.00	11.06
4.60	2.00	0.41	5.00	11.06	0.00	11.06
4.65	2.00	0.41	5.00	11.06	0.00	11.06
4.70	2.00	0.41	5.00	11.06	0.00	11.06
4.75	2.00	0.41	5.00	11.06	0.00	11.06
4.80	2.00	0.42	5.00	11.06	0.00	11.06
4.85	2.00	0.42	5.00	11.06	0.00	11.06
4.90	2.00	0.42	5.00	11.06	0.00	11.06
4.95	2.00	0.42	5.00	11.06	0.00	11.06
5.00	2.00	0.42	5.00	11.06	0.00	11.06
5.05	2.00	0.43	5.00	11.06	0.00	11.06
5.10	2.00	0.43	5.00	11.06	0.00	11.06
5.15	2.00	0.43	5.00	11.06	0.00	11.06
5.20	2.00	0.43	5.00	11.06	0.00	11.06
5.25	2.00	0.43	5.00	11.06	0.00	11.06
5.30	2.00	0.44	5.00	11.06	0.00	11.06
5.35	2.00	0.44	5.00	11.06	0.00	11.06
5.40	2.00	0.44	5.00	11.06	0.00	11.06
5.45	2.00	0.44	5.00	11.06	0.00	11.06
5.50	2.00	0.44	5.00	11.06	0.00	11.06
5.55	2.00	0.45	5.00	11.06	0.00	11.06
5.60	2.00	0.45	5.00	11.06	0.00	11.06
5.65	2.00	0.45	5.00	11.06	0.00	11.06
5.70	2.00	0.45	5.00	11.06	0.00	11.06
5.75	2.00	0.45	5.00	11.06	0.00	11.06
5.80	2.00	0.46	5.00	11.06	0.00	11.06
5.85	2.00	0.46	5.00	11.06	0.00	11.06
5.90	2.00	0.46	5.00	11.06	0.00	11.06
5.95	2.00	0.46	5.00	11.06	0.00	11.06
6.00	2.00	0.46	5.00	11.06	0.00	11.06
6.05	2.00	0.46	5.00	11.06	0.00	11.06
6.10	2.00	0.47	5.00	11.06	0.00	11.06
6.15	2.00	0.47	5.00	11.06	0.00	11.06
6.20	2.00	0.47	5.00	11.06	0.00	11.06
6.25	2.00	0.47	5.00	11.06	0.00	11.06
6.30	2.00	0.47	5.00	11.06	0.00	11.06
6.35	2.00	0.47	5.00	11.06	0.00	11.06
6.40	2.00	0.48	5.00	11.06	0.00	11.06
6.45	2.00	0.48	5.00	11.06	0.00	11.06
6.50	2.00	0.48	5.00	11.06	0.00	11.06
6.55	2.00	0.48	5.00	11.06	0.00	11.06
6.60	2.00	0.48	5.00	11.06	0.00	11.06
6.65	2.00	0.48	5.00	11.06	0.00	11.06
6.70	2.00	0.48	5.00	11.06	0.00	11.06
6.75	2.00	0.49	5.00	11.06	0.00	11.06
6.80	2.00	0.49	5.00	11.06	0.00	11.06
6.85	2.00	0.49	5.00	11.06	0.00	11.06
6.90	2.00	0.49	5.00	11.06	0.00	11.06
6.95	2.00	0.49	5.00	11.06	0.00	11.06
7.00	0.08	0.49	0.17*	11.06	0.00	11.06
7.05	0.08	0.49	0.16*	11.03	0.00	11.03
7.10	0.08	0.49	0.16*	11.01	0.00	11.01
7.15	0.08	0.50	0.16*	10.98	0.00	10.98
7.20	0.08	0.50	0.16*	10.95	0.00	10.95
7.25	0.08	0.50	0.16*	10.92	0.00	10.92
7.30	0.08	0.50	0.16*	10.90	0.00	10.90
7.35	0.08	0.50	0.16*	10.87	0.00	10.87
7.40	0.08	0.50	0.16*	10.84	0.00	10.84
7.45	0.08	0.50	0.16*	10.81	0.00	10.81
7.50	0.08	0.50	0.16*	10.78	0.00	10.78
7.55	0.08	0.50	0.16*	10.76	0.00	10.76
7.60	0.08	0.51	0.16*	10.73	0.00	10.73
7.65	0.08	0.51	0.16*	10.70	0.00	10.70
7.70	0.08	0.51	0.16*	10.67	0.00	10.67
7.75	0.08	0.51	0.15*	10.64	0.00	10.64
7.80	0.08	0.51	0.15*	10.62	0.00	10.62
7.85	0.08	0.51	0.15*	10.59	0.00	10.59
7.90	0.08	0.51	0.15*	10.56	0.00	10.56
7.95	0.08	0.51	0.15*	10.53	0.00	10.53
8.00	0.08	0.51	0.15*	10.50	0.00	10.50
8.05	0.08	0.51	0.15*	10.47	0.00	10.47
8.10	0.08	0.52	0.15*	10.45	0.00	10.45
8.15	0.08	0.52	0.15*	10.42	0.00	10.42
8.20	0.08	0.52	0.15*	10.39	0.00	10.39
8.25	0.08	0.52	0.16*	10.36	0.00	10.36
8.30	0.08	0.52	0.16*	10.33	0.00	10.33
8.35	0.08	0.52	0.16*	10.31	0.00	10.31
8.40	0.08	0.52	0.16*	10.28	0.00	10.28
8.45	0.08	0.52	0.16*	10.25	0.00	10.25
8.50	0.08	0.52	0.16*	10.22	0.00	10.22
8.55	0.08	0.52	0.16*	10.20	0.00	10.20
8.60	0.08	0.52	0.16*	10.17	0.00	10.17
8.65	0.08	0.53	0.16*	10.14	0.00	10.14
8.70	0.08	0.53	0.15*	10.11	0.00	10.11
8.75	0.08	0.53	0.15*	10.09	0.00	10.09
8.80	0.08	0.53	0.15*	10.06	0.00	10.06
8.85	0.08	0.53	0.15*	10.03	0.00	10.03
8.90	0.08	0.53	0.15*	10.00	0.00	10.00
8.95	0.08	0.53	0.15*	9.98	0.00	9.98
9.00	0.08	0.53	0.15*	9.95	0.00	9.95
9.05	0.08	0.53	0.15*	9.92	0.00	9.92
9.10	0.08	0.53	0.15*	9.89	0.00	9.89
9.15	0.08	0.53	0.15*	9.87	0.00	9.87
9.20	0.08	0.53	0.15*	9.84	0.00	9.84
9.25	0.08	0.54	0.15*	9.81	0.00	9.81
9.30	0.08	0.54	0.15*	9.78	0.00	9.78
9.35	0.08	0.54	0.15*	9.75	0.00	9.75
9.40	0.08	0.54	0.15*	9.73	0.00	9.73

9.45	0.08	0.54	0.15*	9.70	0.00	9.70
9.50	0.08	0.54	0.15*	9.67	0.00	9.67
9.55	0.08	0.54	0.15*	9.64	0.00	9.64
9.60	0.08	0.54	0.15*	9.62	0.00	9.62
9.65	0.08	0.54	0.15*	9.59	0.00	9.59
9.70	0.08	0.54	0.15*	9.56	0.00	9.56
9.75	0.08	0.54	0.15*	9.53	0.00	9.53
9.80	0.08	0.54	0.14*	9.50	0.00	9.50
9.85	0.08	0.54	0.14*	9.47	0.00	9.47
9.90	0.08	0.55	0.14*	9.45	0.00	9.45
9.95	0.08	0.55	0.14*	9.42	0.00	9.42
10.00	0.08	0.55	0.14*	9.39	0.00	9.39
10.05	0.08	0.55	0.14*	9.36	0.00	9.36
10.10	0.08	0.55	0.14*	9.33	0.00	9.33
10.15	0.08	0.55	0.14*	9.31	0.00	9.31
10.20	0.08	0.55	0.14*	9.28	0.00	9.28
10.25	0.08	0.55	0.14*	9.25	0.00	9.25
10.30	0.08	0.55	0.14*	9.22	0.00	9.22
10.35	0.08	0.55	0.14*	9.19	0.00	9.19
10.40	0.08	0.55	0.14*	9.16	0.00	9.16
10.45	0.08	0.55	0.14*	9.14	0.00	9.14
10.50	0.08	0.55	0.14*	9.11	0.00	9.11
10.55	0.08	0.55	0.14*	9.08	0.00	9.08
10.60	0.08	0.55	0.14*	9.05	0.00	9.05
10.65	0.08	0.55	0.14*	9.02	0.00	9.02
10.70	0.08	0.56	0.14*	8.99	0.00	8.99
10.75	0.08	0.56	0.14*	8.96	0.00	8.96
10.80	0.08	0.56	0.14*	8.94	0.00	8.94
10.85	0.08	0.56	0.14*	8.91	0.00	8.91
10.90	0.08	0.56	0.14*	8.88	0.00	8.88
10.95	0.08	0.56	0.14*	8.85	0.00	8.85
11.00	0.08	0.56	0.14*	8.82	0.00	8.82
11.05	0.08	0.56	0.14*	8.79	0.00	8.79
11.10	0.08	0.56	0.15*	8.76	0.00	8.76
11.15	0.09	0.56	0.16*	8.74	0.00	8.74
11.20	0.09	0.56	0.16*	8.71	0.00	8.71
11.25	0.10	0.56	0.17*	8.68	0.00	8.68
11.30	0.10	0.56	0.18*	8.66	0.00	8.66
11.35	0.11	0.56	0.19*	8.64	0.00	8.64
11.40	0.11	0.56	0.20*	8.61	0.00	8.61
11.45	0.12	0.56	0.21*	8.59	0.00	8.59
11.50	0.13	0.56	0.23*	8.57	0.00	8.57
11.55	0.13	0.56	0.24*	8.55	0.00	8.55
11.60	0.14	0.57	0.25*	8.53	0.00	8.53
11.65	0.15	0.57	0.26*	8.51	0.00	8.51
11.70	0.15	0.57	0.27*	8.49	0.00	8.49
11.75	0.16	0.57	0.28*	8.47	0.00	8.47
11.80	0.17	0.57	0.30*	8.45	0.00	8.45
11.85	0.17	0.57	0.31*	8.44	0.00	8.44
11.90	0.18	0.57	0.32*	8.42	0.00	8.42
11.95	0.19	0.57	0.33*	8.40	0.00	8.40
12.00	0.19	0.57	0.34*	8.39	0.00	8.39
12.05	0.19	0.57	0.34*	8.37	0.00	8.37
12.10	0.19	0.57	0.33*	8.35	0.00	8.35
12.15	0.19	0.57	0.33*	8.34	0.00	8.34
12.20	0.19	0.57	0.32*	8.32	0.00	8.32
12.25	0.18	0.57	0.32*	8.31	0.00	8.31
12.30	0.18	0.57	0.32*	8.29	0.00	8.29
12.35	0.18	0.57	0.31*	8.27	0.00	8.27
12.40	0.18	0.57	0.31*	8.26	0.00	8.26
12.45	0.18	0.57	0.31*	8.24	0.00	8.24
12.50	0.17	0.57	0.30*	8.22	0.00	8.22
12.55	0.17	0.57	0.30*	8.20	0.00	8.20
12.60	0.17	0.57	0.29*	8.19	0.00	8.19
12.65	0.17	0.58	0.29*	8.17	0.00	8.17
12.70	0.16	0.58	0.29*	8.15	0.00	8.15
12.75	0.16	0.58	0.28*	8.13	0.00	8.13
12.80	0.16	0.58	0.28*	8.12	0.00	8.12
12.85	0.16	0.58	0.27*	8.10	0.00	8.10
12.90	0.16	0.58	0.27*	8.08	0.00	8.08
12.95	0.15	0.58	0.27*	8.06	0.00	8.06
13.00	0.15	0.58	0.26*	8.04	0.00	8.04
13.05	0.15	0.58	0.26*	8.02	0.00	8.02
13.10	0.15	0.58	0.26*	8.00	0.00	8.00
13.15	0.15	0.58	0.25*	7.99	0.00	7.99
13.20	0.14	0.58	0.25*	7.97	0.00	7.97
13.25	0.14	0.58	0.24*	7.95	0.00	7.95
13.30	0.14	0.58	0.24*	7.93	0.00	7.93
13.35	0.14	0.58	0.24*	7.91	0.00	7.91
13.40	0.14	0.58	0.23*	7.89	0.00	7.89
13.45	0.13	0.58	0.23*	7.87	0.00	7.87
13.50	0.13	0.58	0.23*	7.85	0.00	7.85
13.55	0.13	0.58	0.22*	7.83	0.00	7.83
13.60	0.13	0.58	0.22*	7.81	0.00	7.81
13.65	0.13	0.58	0.22*	7.79	0.00	7.79
13.70	0.12	0.58	0.21*	7.77	0.00	7.77
13.75	0.12	0.58	0.21*	7.75	0.00	7.75
13.80	0.12	0.58	0.21*	7.72	0.00	7.72
13.85	0.12	0.58	0.20*	7.70	0.00	7.70
13.90	0.12	0.59	0.20*	7.68	0.00	7.68
13.95	0.11	0.59	0.20*	7.66	0.00	7.66
14.00	0.11	0.59	0.19*	7.64	0.00	7.64
14.05	0.11	0.59	0.19*	7.62	0.00	7.62
14.10	0.11	0.59	0.19*	7.59	0.00	7.59
14.15	0.11	0.59	0.19*	7.57	0.00	7.57
14.20	0.11	0.59	0.19*	7.55	0.00	7.55
14.25	0.11	0.59	0.19*	7.53	0.00	7.53
14.30	0.11	0.59	0.19*	7.50	0.00	7.50
14.35	0.11	0.59	0.19*	7.48	0.00	7.48
14.40	0.11	0.59	0.19*	7.46	0.00	7.46
14.45	0.11	0.59	0.19*	7.44	0.00	7.44
14.50	0.11	0.59	0.19*	7.41	0.00	7.41
14.55	0.11	0.59	0.19*	7.39	0.00	7.39
14.60	0.11	0.59	0.19*	7.37	0.00	7.37
14.65	0.11	0.59	0.19*	7.35	0.00	7.35
14.70	0.11	0.59	0.19*	7.32	0.00	7.32
14.75	0.11	0.59	0.19*	7.30	0.00	7.30
14.80	0.12	0.59	0.21*	7.28	0.00	7.28
14.85	0.12	0.59	0.21*	7.26	0.00	7.26
14.90	0.12	0.59	0.21*	7.24	0.00	7.24
14.95	0.12	0.59	0.21*	7.22	0.00	7.22
15.00	0.12	0.59	0.20*	7.19	0.00	7.19
15.05	0.12	0.59	0.20*	7.17	0.00	7.17
15.10	0.12	0.59	0.20*	7.15	0.00	7.15
15.15	0.12	0.59	0.20*	7.13	0.00	7.13
15.20	0.12	0.59	0.20*	7.11	0.00	7.11
15.25	0.12	0.59	0.20*	7.09	0.00	7.09
15.30	0.12	0.59	0.20*	7.07	0.00	7.07
15.35	0.12	0.59	0.20*	7.05	0.00	7.05
15.40	0.12	0.59	0.20*	7.02	0.00	7.02
15.45	0.12	0.59	0.20*	7.00	0.00	7.00
15.50	0.12	0.60	0.20*	6.98	0.00	6.98
15.55	0.12	0.60	0.20*	6.96	0.00	6.96
15.60	0.12	0.60	0.20*	6.94	0.00	6.94
15.65	0.12	0.60	0.20*	6.92	0.00	6.92
15.70	0.12	0.60	0.20*	6.90	0.00	6.90
15.75	0.12	0.60	0.20*	6.88	0.00	6.88
15.80	0.12	0.60	0.20*	6.85	0.00	6.85
15.85	0.12	0.60	0.20*	6.83	0.00	6.83
15.90	0.12	0.60	0.20*	6.81	0.00	6.81
15.95	0.12	0.60	0.20*	6.79	0.00	6.79
16.00	0.12	0.60	0.20*	6.77	0.00	6.77
16.05	0.12	0.60	0.20*	6.75	0.00	6.75
16.10	0.12	0.60	0.20*	6.73	0.00	6.73
16.15	0.12	0.60	0.20*	6.70	0.00	6.70
16.20	0.12	0.60	0.20*	6.68	0.00	6.68
16.25	0.12	0.60	0.20*	6.66	0.00	6.66
16.30	0.12	0.60	0.20*	6.64	0.00	6.64

16.35	0.12	0.60	0.20*	6.62	0.00	6.62
16.40	0.12	0.60	0.20*	6.60	0.00	6.60
16.45	0.12	0.60	0.20*	6.58	0.00	6.58
16.50	0.12	0.60	0.20*	6.55	0.00	6.55
16.55	0.12	0.60	0.20*	6.53	0.00	6.53
16.60	0.12	0.60	0.20*	6.51	0.00	6.51
16.65	0.12	0.60	0.20*	6.49	0.00	6.49
16.70	0.12	0.60	0.20*	6.47	0.00	6.47
16.75	0.12	0.60	0.20*	6.45	0.00	6.45
16.80	0.12	0.60	0.20*	6.42	0.00	6.42
16.85	0.12	0.60	0.20*	6.40	0.00	6.40
16.90	0.12	0.60	0.20*	6.38	0.00	6.38
16.95	0.12	0.60	0.20*	6.36	0.00	6.36
17.00	0.12	0.60	0.20*	6.34	0.00	6.34
17.05	0.12	0.60	0.20*	6.32	0.00	6.32
17.10	0.12	0.60	0.20*	6.29	0.00	6.29
17.15	0.12	0.60	0.20*	6.27	0.00	6.27
17.20	0.12	0.60	0.20*	6.25	0.00	6.25
17.25	0.12	0.60	0.19*	6.23	0.00	6.23
17.30	0.12	0.60	0.19*	6.21	0.00	6.21
17.35	0.12	0.60	0.19*	6.19	0.00	6.19
17.40	0.12	0.60	0.19*	6.16	0.00	6.16
17.45	0.12	0.60	0.19*	6.14	0.00	6.14
17.50	0.12	0.61	0.19*	6.12	0.00	6.12
17.55	0.12	0.61	0.19*	6.10	0.00	6.10
17.60	0.12	0.61	0.19*	6.08	0.00	6.08
17.65	0.12	0.61	0.19*	6.06	0.00	6.06
17.70	0.12	0.61	0.19*	6.03	0.00	6.03
17.75	0.12	0.61	0.19*	6.01	0.00	6.01
17.80	0.12	0.61	0.19*	5.99	0.00	5.99
17.85	0.12	0.61	0.19*	5.97	0.00	5.97
17.90	0.12	0.61	0.19*	5.95	0.00	5.95
17.95	0.12	0.61	0.19*	5.93	0.00	5.93
18.00	2.00	0.61	5.00	5.90	0.00	5.90
18.05	2.00	0.61	5.00	5.90	0.00	5.90
18.10	2.00	0.61	5.00	5.90	0.00	5.90
18.15	2.00	0.61	5.00	5.90	0.00	5.90
18.20	2.00	0.61	5.00	5.90	0.00	5.90
18.25	2.00	0.61	5.00	5.90	0.00	5.90
18.30	2.00	0.61	5.00	5.90	0.00	5.90
18.35	2.00	0.61	5.00	5.90	0.00	5.90
18.40	2.00	0.61	5.00	5.90	0.00	5.90
18.45	2.00	0.61	5.00	5.90	0.00	5.90
18.50	2.00	0.61	5.00	5.90	0.00	5.90
18.55	2.00	0.61	5.00	5.90	0.00	5.90
18.60	2.00	0.61	5.00	5.90	0.00	5.90
18.65	2.00	0.61	5.00	5.90	0.00	5.90
18.70	2.00	0.61	5.00	5.90	0.00	5.90
18.75	2.00	0.61	5.00	5.90	0.00	5.90
18.80	2.00	0.61	5.00	5.90	0.00	5.90
18.85	2.00	0.61	5.00	5.90	0.00	5.90
18.90	2.00	0.61	5.00	5.90	0.00	5.90
18.95	2.00	0.61	5.00	5.90	0.00	5.90
19.00	2.00	0.61	5.00	5.90	0.00	5.90
19.05	2.00	0.61	5.00	5.90	0.00	5.90
19.10	2.00	0.61	5.00	5.90	0.00	5.90
19.15	2.00	0.61	5.00	5.90	0.00	5.90
19.20	2.00	0.61	5.00	5.90	0.00	5.90
19.25	2.00	0.61	5.00	5.90	0.00	5.90
19.30	2.00	0.61	5.00	5.90	0.00	5.90
19.35	2.00	0.61	5.00	5.90	0.00	5.90
19.40	2.00	0.61	5.00	5.90	0.00	5.90
19.45	2.00	0.61	5.00	5.90	0.00	5.90
19.50	2.00	0.61	5.00	5.90	0.00	5.90
19.55	2.00	0.61	5.00	5.90	0.00	5.90
19.60	2.00	0.61	5.00	5.90	0.00	5.90
19.65	2.00	0.61	5.00	5.90	0.00	5.90
19.70	2.00	0.61	5.00	5.90	0.00	5.90
19.75	2.00	0.61	5.00	5.90	0.00	5.90
19.80	2.00	0.61	5.00	5.90	0.00	5.90
19.85	2.00	0.61	5.00	5.90	0.00	5.90
19.90	2.00	0.61	5.00	5.90	0.00	5.90
19.95	2.00	0.61	5.00	5.90	0.00	5.90
20.00	2.00	0.61	5.00	5.90	0.00	5.90
20.05	2.00	0.61	5.00	5.90	0.00	5.90
20.10	2.00	0.61	5.00	5.90	0.00	5.90
20.15	2.00	0.61	5.00	5.90	0.00	5.90
20.20	2.00	0.61	5.00	5.90	0.00	5.90
20.25	2.00	0.61	5.00	5.90	0.00	5.90
20.30	2.00	0.61	5.00	5.90	0.00	5.90
20.35	2.00	0.62	5.00	5.90	0.00	5.90
20.40	2.00	0.62	5.00	5.90	0.00	5.90
20.45	2.00	0.62	5.00	5.90	0.00	5.90
20.50	2.00	0.62	5.00	5.90	0.00	5.90
20.55	2.00	0.62	5.00	5.90	0.00	5.90
20.60	2.00	0.62	5.00	5.90	0.00	5.90
20.65	2.00	0.62	5.00	5.90	0.00	5.90
20.70	2.00	0.62	5.00	5.90	0.00	5.90
20.75	2.00	0.62	5.00	5.90	0.00	5.90
20.80	2.00	0.62	5.00	5.90	0.00	5.90
20.85	2.00	0.62	5.00	5.90	0.00	5.90
20.90	2.00	0.62	5.00	5.90	0.00	5.90
20.95	2.00	0.62	5.00	5.90	0.00	5.90
21.00	2.00	0.62	5.00	5.90	0.00	5.90
21.05	2.00	0.62	5.00	5.90	0.00	5.90
21.10	2.00	0.62	5.00	5.90	0.00	5.90
21.15	2.00	0.62	5.00	5.90	0.00	5.90
21.20	2.00	0.62	5.00	5.90	0.00	5.90
21.25	2.00	0.62	5.00	5.90	0.00	5.90
21.30	2.00	0.62	5.00	5.90	0.00	5.90
21.35	2.00	0.62	5.00	5.90	0.00	5.90
21.40	2.00	0.62	5.00	5.90	0.00	5.90
21.45	2.00	0.62	5.00	5.90	0.00	5.90
21.50	2.00	0.62	5.00	5.90	0.00	5.90
21.55	2.00	0.62	5.00	5.90	0.00	5.90
21.60	2.00	0.62	5.00	5.90	0.00	5.90
21.65	2.00	0.62	5.00	5.90	0.00	5.90
21.70	2.00	0.62	5.00	5.90	0.00	5.90
21.75	2.00	0.62	5.00	5.90	0.00	5.90
21.80	2.00	0.62	5.00	5.90	0.00	5.90
21.85	2.00	0.62	5.00	5.90	0.00	5.90
21.90	2.00	0.62	5.00	5.90	0.00	5.90
21.95	2.00	0.62	5.00	5.90	0.00	5.90
22.00	2.00	0.62	5.00	5.90	0.00	5.90
22.05	2.00	0.62	5.00	5.90	0.00	5.90
22.10	2.00	0.62	5.00	5.90	0.00	5.90
22.15	2.00	0.62	5.00	5.90	0.00	5.90
22.20	2.00	0.62	5.00	5.90	0.00	5.90
22.25	2.00	0.62	5.00	5.90	0.00	5.90
22.30	2.00	0.62	5.00	5.90	0.00	5.90
22.35	2.00	0.62	5.00	5.90	0.00	5.90
22.40	2.00	0.62	5.00	5.90	0.00	5.90
22.45	2.00	0.62	5.00	5.90	0.00	5.90
22.50	2.00	0.62	5.00	5.90	0.00	5.90
22.55	2.00	0.62	5.00	5.90	0.00	5.90
22.60	2.00	0.62	5.00	5.90	0.00	5.90
22.65	2.00	0.62	5.00	5.90	0.00	5.90
22.70	2.00	0.62	5.00	5.90	0.00	5.90
22.75	2.00	0.62	5.00	5.90	0.00	5.90
22.80	2.00	0.62	5.00	5.90	0.00	5.90
22.85	2.00	0.62	5.00	5.90	0.00	5.90
22.90	2.00	0.62	5.00	5.90	0.00	5.90
22.95	2.00	0.62	5.00	5.90	0.00	5.90
23.00	2.00	0.62	5.00	5.90	0.00	5.90
23.05	2.00	0.62	5.00	5.90	0.00	5.90
23.10	2.00	0.62	5.00	5.90	0.00	5.90
23.15	2.00	0.62	5.00	5.90	0.00	5.90
23.20	2.00	0.62	5.00	5.90	0.00	5.90

23.25	2.00	0.62	5.00	5.90	0.00	5.90
23.30	2.00	0.62	5.00	5.90	0.00	5.90
23.35	2.00	0.62	5.00	5.90	0.00	5.90
23.40	2.00	0.62	5.00	5.90	0.00	5.90
23.45	2.00	0.62	5.00	5.90	0.00	5.90
23.50	2.00	0.62	5.00	5.90	0.00	5.90
23.55	2.00	0.62	5.00	5.90	0.00	5.90
23.60	2.00	0.62	5.00	5.90	0.00	5.90
23.65	2.00	0.62	5.00	5.90	0.00	5.90
23.70	2.00	0.62	5.00	5.90	0.00	5.90
23.75	2.00	0.62	5.00	5.90	0.00	5.90
23.80	2.00	0.62	5.00	5.90	0.00	5.90
23.85	2.00	0.62	5.00	5.90	0.00	5.90
23.90	2.00	0.62	5.00	5.90	0.00	5.90
23.95	2.00	0.62	5.00	5.90	0.00	5.90
24.00	2.00	0.62	5.00	5.90	0.00	5.90
24.05	2.00	0.62	5.00	5.90	0.00	5.90
24.10	2.00	0.62	5.00	5.90	0.00	5.90
24.15	2.00	0.62	5.00	5.90	0.00	5.90
24.20	2.00	0.62	5.00	5.90	0.00	5.90
24.25	2.00	0.62	5.00	5.90	0.00	5.90
24.30	2.00	0.62	5.00	5.90	0.00	5.90
24.35	2.00	0.62	5.00	5.90	0.00	5.90
24.40	2.00	0.62	5.00	5.90	0.00	5.90
24.45	2.00	0.62	5.00	5.90	0.00	5.90
24.50	2.00	0.62	5.00	5.90	0.00	5.90
24.55	2.00	0.62	5.00	5.90	0.00	5.90
24.60	2.00	0.62	5.00	5.90	0.00	5.90
24.65	2.00	0.62	5.00	5.90	0.00	5.90
24.70	2.00	0.62	5.00	5.90	0.00	5.90
24.75	2.00	0.62	5.00	5.90	0.00	5.90
24.80	2.00	0.62	5.00	5.90	0.00	5.90
24.85	2.00	0.62	5.00	5.90	0.00	5.90
24.90	2.00	0.62	5.00	5.90	0.00	5.90
24.95	2.00	0.62	5.00	5.90	0.00	5.90
25.00	2.00	0.62	5.00	5.90	0.00	5.90
25.05	2.00	0.62	5.00	5.90	0.00	5.90
25.10	2.00	0.62	5.00	5.90	0.00	5.90
25.15	2.00	0.63	5.00	5.90	0.00	5.90
25.20	2.00	0.63	5.00	5.90	0.00	5.90
25.25	2.00	0.63	5.00	5.90	0.00	5.90
25.30	2.00	0.63	5.00	5.90	0.00	5.90
25.35	2.00	0.63	5.00	5.90	0.00	5.90
25.40	2.00	0.63	5.00	5.90	0.00	5.90
25.45	2.00	0.63	5.00	5.90	0.00	5.90
25.50	2.00	0.63	5.00	5.90	0.00	5.90
25.55	2.00	0.63	5.00	5.90	0.00	5.90
25.60	2.00	0.63	5.00	5.90	0.00	5.90
25.65	2.00	0.63	5.00	5.90	0.00	5.90
25.70	2.00	0.63	5.00	5.90	0.00	5.90
25.75	2.00	0.63	5.00	5.90	0.00	5.90
25.80	2.00	0.63	5.00	5.90	0.00	5.90
25.85	2.00	0.63	5.00	5.90	0.00	5.90
25.90	2.00	0.63	5.00	5.90	0.00	5.90
25.95	2.00	0.63	5.00	5.90	0.00	5.90
26.00	2.00	0.63	5.00	5.90	0.00	5.90
26.05	2.00	0.63	5.00	5.90	0.00	5.90
26.10	2.00	0.63	5.00	5.90	0.00	5.90
26.15	2.00	0.63	5.00	5.90	0.00	5.90
26.20	2.00	0.63	5.00	5.90	0.00	5.90
26.25	2.00	0.63	5.00	5.90	0.00	5.90
26.30	2.00	0.63	5.00	5.90	0.00	5.90
26.35	2.00	0.63	5.00	5.90	0.00	5.90
26.40	2.00	0.63	5.00	5.90	0.00	5.90
26.45	2.00	0.63	5.00	5.90	0.00	5.90
26.50	2.00	0.63	5.00	5.90	0.00	5.90
26.55	2.00	0.63	5.00	5.90	0.00	5.90
26.60	2.00	0.63	5.00	5.90	0.00	5.90
26.65	2.00	0.63	5.00	5.90	0.00	5.90
26.70	2.00	0.63	5.00	5.90	0.00	5.90
26.75	2.00	0.63	5.00	5.90	0.00	5.90
26.80	2.00	0.63	5.00	5.90	0.00	5.90
26.85	2.00	0.63	5.00	5.90	0.00	5.90
26.90	2.00	0.63	5.00	5.90	0.00	5.90
26.95	2.00	0.63	5.00	5.90	0.00	5.90
27.00	2.00	0.63	5.00	5.90	0.00	5.90
27.05	2.00	0.63	5.00	5.90	0.00	5.90
27.10	2.00	0.63	5.00	5.90	0.00	5.90
27.15	2.00	0.63	5.00	5.90	0.00	5.90
27.20	2.00	0.63	5.00	5.90	0.00	5.90
27.25	2.00	0.63	5.00	5.90	0.00	5.90
27.30	2.00	0.63	5.00	5.90	0.00	5.90
27.35	2.00	0.63	5.00	5.90	0.00	5.90
27.40	2.00	0.63	5.00	5.90	0.00	5.90
27.45	2.00	0.63	5.00	5.90	0.00	5.90
27.50	2.00	0.63	5.00	5.90	0.00	5.90
27.55	2.00	0.63	5.00	5.90	0.00	5.90
27.60	2.00	0.63	5.00	5.90	0.00	5.90
27.65	2.00	0.63	5.00	5.90	0.00	5.90
27.70	2.00	0.63	5.00	5.90	0.00	5.90
27.75	2.00	0.63	5.00	5.90	0.00	5.90
27.80	2.00	0.63	5.00	5.90	0.00	5.90
27.85	2.00	0.63	5.00	5.90	0.00	5.90
27.90	2.00	0.63	5.00	5.90	0.00	5.90
27.95	2.00	0.63	5.00	5.90	0.00	5.90
28.00	2.00	0.63	5.00	5.90	0.00	5.90
28.05	0.12	0.63	0.20*	5.90	0.00	5.90
28.10	0.12	0.63	0.20*	5.88	0.00	5.88
28.15	0.12	0.63	0.20*	5.86	0.00	5.86
28.20	0.12	0.63	0.20*	5.84	0.00	5.84
28.25	0.12	0.63	0.20*	5.82	0.00	5.82
28.30	0.12	0.63	0.20*	5.80	0.00	5.80
28.35	0.12	0.63	0.20*	5.78	0.00	5.78
28.40	0.12	0.63	0.20*	5.76	0.00	5.76
28.45	0.12	0.63	0.20*	5.74	0.00	5.74
28.50	0.12	0.63	0.20*	5.72	0.00	5.72
28.55	0.12	0.63	0.20*	5.69	0.00	5.69
28.60	0.12	0.63	0.20*	5.67	0.00	5.67
28.65	0.12	0.63	0.20*	5.65	0.00	5.65
28.70	0.12	0.63	0.20*	5.63	0.00	5.63
28.75	0.12	0.63	0.20*	5.61	0.00	5.61
28.80	0.12	0.63	0.20*	5.59	0.00	5.59
28.85	0.12	0.63	0.20*	5.57	0.00	5.57
28.90	0.12	0.63	0.20*	5.55	0.00	5.55
28.95	0.12	0.63	0.20*	5.53	0.00	5.53
29.00	0.12	0.63	0.20*	5.51	0.00	5.51
29.05	0.12	0.63	0.20*	5.49	0.00	5.49
29.10	0.12	0.63	0.20*	5.46	0.00	5.46
29.15	0.12	0.63	0.20*	5.44	0.00	5.44
29.20	0.12	0.63	0.20*	5.42	0.00	5.42
29.25	0.12	0.63	0.20*	5.40	0.00	5.40
29.30	0.12	0.63	0.20*	5.38	0.00	5.38
29.35	0.12	0.63	0.20*	5.36	0.00	5.36
29.40	0.12	0.63	0.20*	5.34	0.00	5.34
29.45	0.12	0.63	0.20*	5.32	0.00	5.32
29.50	0.12	0.63	0.20*	5.30	0.00	5.30
29.55	0.12	0.63	0.20*	5.28	0.00	5.28
29.60	0.12	0.63	0.20*	5.25	0.00	5.25
29.65	0.12	0.63	0.20*	5.23	0.00	5.23
29.70	0.12	0.63	0.20*	5.21	0.00	5.21
29.75	0.12	0.63	0.20*	5.19	0.00	5.19
29.80	0.12	0.63	0.20*	5.17	0.00	5.17
29.85	0.12	0.63	0.20*	5.15	0.00	5.15
29.90	0.12	0.63	0.20*	5.13	0.00	5.13
29.95	0.12	0.63	0.20*	5.11	0.00	5.11
30.00	0.12	0.63	0.20*	5.09	0.00	5.09
30.05	0.13	0.63	0.20*	5.07	0.00	5.07
30.10	0.13	0.63	0.21*	5.04	0.00	5.04

30.15	0.13	0.63	0.21*	5.02	0.00	5.02
30.20	0.14	0.63	0.22*	5.00	0.00	5.00
30.25	0.14	0.63	0.22*	4.98	0.00	4.98
30.30	0.14	0.63	0.23*	4.96	0.00	4.96
30.35	0.15	0.63	0.23*	4.95	0.00	4.95
30.40	0.15	0.63	0.24*	4.93	0.00	4.93
30.45	0.15	0.63	0.25*	4.91	0.00	4.91
30.50	0.16	0.63	0.25*	4.89	0.00	4.89
30.55	0.16	0.63	0.26*	4.87	0.00	4.87
30.60	0.16	0.63	0.26*	4.85	0.00	4.85
30.65	0.17	0.63	0.27*	4.84	0.00	4.84
30.70	0.17	0.63	0.27*	4.82	0.00	4.82
30.75	0.18	0.63	0.28*	4.80	0.00	4.80
30.80	0.18	0.63	0.29*	4.78	0.00	4.78
30.85	0.18	0.63	0.29*	4.77	0.00	4.77
30.90	0.19	0.63	0.30*	4.75	0.00	4.75
30.95	0.19	0.63	0.30*	4.73	0.00	4.73
31.00	0.19	0.63	0.31*	4.72	0.00	4.72
31.05	0.19	0.63	0.31*	4.70	0.00	4.70
31.10	0.19	0.63	0.30*	4.68	0.00	4.68
31.15	0.19	0.63	0.30*	4.67	0.00	4.67
31.20	0.19	0.63	0.30*	4.65	0.00	4.65
31.25	0.19	0.63	0.30*	4.64	0.00	4.64
31.30	0.18	0.62	0.29*	4.62	0.00	4.62
31.35	0.18	0.62	0.29*	4.60	0.00	4.60
31.40	0.18	0.62	0.29*	4.59	0.00	4.59
31.45	0.18	0.62	0.29*	4.57	0.00	4.57
31.50	0.18	0.62	0.29*	4.55	0.00	4.55
31.55	0.18	0.62	0.28*	4.54	0.00	4.54
31.60	0.18	0.62	0.28*	4.52	0.00	4.52
31.65	0.17	0.62	0.28*	4.50	0.00	4.50
31.70	0.17	0.62	0.28*	4.49	0.00	4.49
31.75	0.17	0.62	0.28*	4.47	0.00	4.47
31.80	0.17	0.62	0.27*	4.45	0.00	4.45
31.85	0.17	0.62	0.27*	4.43	0.00	4.43
31.90	0.17	0.62	0.27*	4.42	0.00	4.42
31.95	0.17	0.62	0.27*	4.40	0.00	4.40
32.00	0.17	0.62	0.27*	4.38	0.00	4.38
32.05	0.16	0.62	0.26*	4.36	0.00	4.36
32.10	0.16	0.62	0.26*	4.35	0.00	4.35
32.15	0.16	0.62	0.26*	4.33	0.00	4.33
32.20	0.16	0.62	0.26*	4.31	0.00	4.31
32.25	0.16	0.62	0.26*	4.29	0.00	4.29
32.30	0.16	0.62	0.25*	4.27	0.00	4.27
32.35	0.16	0.62	0.25*	4.25	0.00	4.25
32.40	0.15	0.62	0.25*	4.24	0.00	4.24
32.45	0.15	0.62	0.25*	4.22	0.00	4.22
32.50	0.15	0.62	0.24*	4.20	0.00	4.20
32.55	0.15	0.62	0.24*	4.18	0.00	4.18
32.60	0.15	0.62	0.24*	4.16	0.00	4.16
32.65	0.15	0.62	0.24*	4.14	0.00	4.14
32.70	0.15	0.62	0.24*	4.12	0.00	4.12
32.75	0.14	0.62	0.23*	4.10	0.00	4.10
32.80	0.14	0.62	0.23*	4.08	0.00	4.08
32.85	0.14	0.62	0.23*	4.07	0.00	4.07
32.90	0.14	0.62	0.23*	4.05	0.00	4.05
32.95	0.14	0.62	0.23*	4.03	0.00	4.03
33.00	0.14	0.62	0.22*	4.01	0.00	4.01
33.05	0.14	0.62	0.23*	3.99	0.00	3.99
33.10	0.14	0.62	0.23*	3.97	0.00	3.97
33.15	0.14	0.62	0.23*	3.95	0.00	3.95
33.20	0.15	0.62	0.24*	3.93	0.00	3.93
33.25	0.15	0.62	0.24*	3.91	0.00	3.91
33.30	0.15	0.62	0.25*	3.89	0.00	3.89
33.35	0.15	0.62	0.25*	3.87	0.00	3.87
33.40	0.16	0.62	0.25*	3.85	0.00	3.85
33.45	0.16	0.62	0.26*	3.84	0.00	3.84
33.50	0.16	0.62	0.26*	3.82	0.00	3.82
33.55	0.16	0.62	0.27*	3.80	0.00	3.80
33.60	0.17	0.62	0.27*	3.78	0.00	3.78
33.65	0.17	0.62	0.27*	3.76	0.00	3.76
33.70	0.17	0.62	0.28*	3.75	0.00	3.75
33.75	0.17	0.62	0.28*	3.73	0.00	3.73
33.80	0.17	0.62	0.28*	3.71	0.00	3.71
33.85	0.18	0.62	0.29*	3.69	0.00	3.69
33.90	0.18	0.61	0.29*	3.68	0.00	3.68
33.95	0.18	0.61	0.30*	3.66	0.00	3.66
34.00	0.18	0.61	0.30*	3.64	0.00	3.64
34.05	0.19	0.61	0.30*	3.63	0.00	3.63
34.10	0.19	0.61	0.31*	3.61	0.00	3.61
34.15	0.19	0.61	0.31*	3.59	0.00	3.59
34.20	0.19	0.61	0.31*	3.58	0.00	3.58
34.25	0.19	0.61	0.32*	3.56	0.00	3.56
34.30	0.20	0.61	0.32*	3.55	0.00	3.55
34.35	0.20	0.61	0.33*	3.53	0.00	3.53
34.40	0.20	0.61	0.33*	3.51	0.00	3.51
34.45	0.20	0.61	0.33*	3.50	0.00	3.50
34.50	0.21	0.61	0.34*	3.48	0.00	3.48
34.55	0.21	0.61	0.34*	3.47	0.00	3.47
34.60	0.21	0.61	0.34*	3.45	0.00	3.45
34.65	0.21	0.61	0.35*	3.44	0.00	3.44
34.70	0.21	0.61	0.35*	3.42	0.00	3.42
34.75	0.22	0.61	0.35*	3.41	0.00	3.41
34.80	0.22	0.61	0.36*	3.39	0.00	3.39
34.85	0.22	0.61	0.36*	3.38	0.00	3.38
34.90	0.22	0.61	0.37*	3.37	0.00	3.37
34.95	0.23	0.61	0.37*	3.35	0.00	3.35
35.00	0.23	0.61	0.37*	3.34	0.00	3.34
35.05	0.23	0.61	0.38*	3.32	0.00	3.32
35.10	0.23	0.61	0.38*	3.31	0.00	3.31
35.15	0.23	0.61	0.39*	3.29	0.00	3.29
35.20	0.24	0.61	0.39*	3.28	0.00	3.28
35.25	0.24	0.61	0.39*	3.27	0.00	3.27
35.30	0.24	0.61	0.40*	3.25	0.00	3.25
35.35	0.24	0.61	0.40*	3.24	0.00	3.24
35.40	0.25	0.61	0.40*	3.23	0.00	3.23
35.45	0.25	0.61	0.41*	3.21	0.00	3.21
35.50	0.25	0.61	0.41*	3.20	0.00	3.20
35.55	0.25	0.61	0.42*	3.19	0.00	3.19
35.60	0.26	0.61	0.42*	3.18	0.00	3.18
35.65	0.26	0.61	0.42*	3.16	0.00	3.16
35.70	0.26	0.61	0.43*	3.15	0.00	3.15
35.75	0.26	0.61	0.43*	3.14	0.00	3.14
35.80	0.26	0.61	0.44*	3.12	0.00	3.12
35.85	0.27	0.61	0.44*	3.11	0.00	3.11
35.90	0.27	0.61	0.45*	3.10	0.00	3.10
35.95	0.27	0.61	0.45*	3.09	0.00	3.09
36.00	0.27	0.60	0.45*	3.08	0.00	3.08
36.05	0.28	0.60	0.46*	3.06	0.00	3.06
36.10	0.28	0.60	0.46*	3.05	0.00	3.05
36.15	0.28	0.60	0.47*	3.04	0.00	3.04
36.20	0.28	0.60	0.47*	3.03	0.00	3.03
36.25	0.29	0.60	0.48*	3.02	0.00	3.02
36.30	0.29	0.60	0.48*	3.00	0.00	3.00
36.35	0.29	0.60	0.49*	2.99	0.00	2.99
36.40	0.30	0.60	0.49*	2.98	0.00	2.98
36.45	0.30	0.60	0.49*	2.97	0.00	2.97
36.50	0.30	0.60	0.50*	2.96	0.00	2.96
36.55	0.30	0.60	0.50*	2.95	0.00	2.95
36.60	0.31	0.60	0.51*	2.94	0.00	2.94
36.65	0.31	0.60	0.51*	2.92	0.00	2.92
36.70	0.31	0.60	0.52*	2.91	0.00	2.91
36.75	0.32	0.60	0.52*	2.90	0.00	2.90
36.80	0.32	0.60	0.53*	2.89	0.00	2.89
36.85	0.32	0.60	0.54*	2.88	0.00	2.88
36.90	0.32	0.60	0.54*	2.87	0.00	2.87
36.95	0.33	0.60	0.55*	2.86	0.00	2.86
37.00	0.33	0.60	0.55*	2.85	0.00	2.85

37.05	0.33	0.60	0.56*	2.84	0.00	2.84
37.10	0.34	0.60	0.56*	2.83	0.00	2.83
37.15	0.34	0.60	0.57*	2.82	0.00	2.82
37.20	0.34	0.60	0.58*	2.81	0.00	2.81
37.25	0.35	0.60	0.58*	2.80	0.00	2.80
37.30	0.35	0.60	0.59*	2.79	0.00	2.79
37.35	0.36	0.60	0.60*	2.78	0.00	2.78
37.40	0.36	0.60	0.60*	2.77	0.00	2.77
37.45	0.36	0.60	0.61*	2.76	0.00	2.76
37.50	0.37	0.60	0.62*	2.76	0.00	2.76
37.55	0.37	0.60	0.62*	2.75	0.00	2.75
37.60	0.38	0.60	0.63*	2.74	0.00	2.74
37.65	0.38	0.60	0.64*	2.73	0.00	2.73
37.70	0.38	0.60	0.65*	2.72	0.00	2.72
37.75	0.39	0.60	0.65*	2.71	0.00	2.71
37.80	0.39	0.60	0.66*	2.71	0.00	2.71
37.85	0.40	0.59	0.67*	2.70	0.00	2.70
37.90	0.41	0.59	0.68*	2.69	0.00	2.69
37.95	0.41	0.59	0.69*	2.69	0.00	2.69
38.00	0.42	0.59	0.70*	2.68	0.00	2.68
38.05	0.42	0.59	0.70*	2.67	0.00	2.67
38.10	0.42	0.59	0.70*	2.67	0.00	2.67
38.15	0.42	0.59	0.70*	2.66	0.00	2.66
38.20	0.41	0.59	0.70*	2.65	0.00	2.65
38.25	0.41	0.59	0.70*	2.65	0.00	2.65
38.30	0.41	0.59	0.70*	2.64	0.00	2.64
38.35	0.41	0.59	0.70*	2.63	0.00	2.63
38.40	0.41	0.59	0.70*	2.63	0.00	2.63
38.45	0.41	0.59	0.70*	2.62	0.00	2.62
38.50	0.41	0.59	0.70*	2.61	0.00	2.61
38.55	0.41	0.59	0.70*	2.61	0.00	2.61
38.60	0.41	0.59	0.69*	2.60	0.00	2.60
38.65	0.41	0.59	0.69*	2.59	0.00	2.59
38.70	0.41	0.59	0.69*	2.59	0.00	2.59
38.75	0.41	0.59	0.69*	2.58	0.00	2.58
38.80	0.41	0.59	0.69*	2.57	0.00	2.57
38.85	0.41	0.59	0.69*	2.57	0.00	2.57
38.90	0.41	0.59	0.69*	2.56	0.00	2.56
38.95	0.41	0.59	0.69*	2.55	0.00	2.55
39.00	0.41	0.59	0.69*	2.55	0.00	2.55
39.05	0.41	0.59	0.69*	2.54	0.00	2.54
39.10	0.40	0.59	0.69*	2.53	0.00	2.53
39.15	0.40	0.59	0.69*	2.53	0.00	2.53
39.20	0.40	0.59	0.69*	2.52	0.00	2.52
39.25	0.40	0.59	0.69*	2.51	0.00	2.51
39.30	0.40	0.59	0.69*	2.50	0.00	2.50
39.35	0.40	0.59	0.69*	2.50	0.00	2.50
39.40	0.40	0.59	0.69*	2.49	0.00	2.49
39.45	0.40	0.59	0.69*	2.48	0.00	2.48
39.50	0.40	0.59	0.69*	2.48	0.00	2.48
39.55	0.40	0.58	0.68*	2.47	0.00	2.47
39.60	0.40	0.58	0.68*	2.46	0.00	2.46
39.65	0.40	0.58	0.68*	2.46	0.00	2.46
39.70	0.40	0.58	0.68*	2.45	0.00	2.45
39.75	0.40	0.58	0.68*	2.44	0.00	2.44
39.80	0.40	0.58	0.68*	2.43	0.00	2.43
39.85	0.40	0.58	0.68*	2.43	0.00	2.43
39.90	0.40	0.58	0.68*	2.42	0.00	2.42
39.95	0.40	0.58	0.68*	2.41	0.00	2.41
40.00	0.40	0.58	0.68*	2.41	0.00	2.41
40.05	0.40	0.58	0.68*	2.40	0.00	2.40
40.10	0.40	0.58	0.68*	2.39	0.00	2.39
40.15	0.39	0.58	0.68*	2.38	0.00	2.38
40.20	0.39	0.58	0.68*	2.38	0.00	2.38
40.25	0.39	0.58	0.68*	2.37	0.00	2.37
40.30	0.39	0.58	0.68*	2.36	0.00	2.36
40.35	0.39	0.58	0.68*	2.36	0.00	2.36
40.40	0.39	0.58	0.68*	2.35	0.00	2.35
40.45	0.39	0.58	0.68*	2.34	0.00	2.34
40.50	0.39	0.58	0.68*	2.33	0.00	2.33
40.55	0.39	0.58	0.68*	2.33	0.00	2.33
40.60	0.39	0.58	0.68*	2.32	0.00	2.32
40.65	0.39	0.58	0.68*	2.31	0.00	2.31
40.70	0.39	0.58	0.67*	2.31	0.00	2.31
40.75	0.39	0.58	0.67*	2.30	0.00	2.30
40.80	0.39	0.58	0.67*	2.29	0.00	2.29
40.85	0.39	0.58	0.67*	2.28	0.00	2.28
40.90	0.39	0.58	0.67*	2.28	0.00	2.28
40.95	0.39	0.58	0.67*	2.27	0.00	2.27
41.00	0.39	0.58	0.67*	2.26	0.00	2.26
41.05	0.39	0.58	0.67*	2.25	0.00	2.25
41.10	0.39	0.58	0.67*	2.25	0.00	2.25
41.15	0.39	0.58	0.67*	2.24	0.00	2.24
41.20	0.39	0.58	0.67*	2.23	0.00	2.23
41.25	0.39	0.58	0.67*	2.22	0.00	2.22
41.30	0.39	0.57	0.67*	2.22	0.00	2.22
41.35	0.38	0.57	0.67*	2.21	0.00	2.21
41.40	0.38	0.57	0.67*	2.20	0.00	2.20
41.45	0.38	0.57	0.67*	2.19	0.00	2.19
41.50	0.38	0.57	0.67*	2.19	0.00	2.19
41.55	0.38	0.57	0.67*	2.18	0.00	2.18
41.60	0.38	0.57	0.67*	2.17	0.00	2.17
41.65	0.38	0.57	0.67*	2.16	0.00	2.16
41.70	0.38	0.57	0.67*	2.16	0.00	2.16
41.75	0.38	0.57	0.67*	2.15	0.00	2.15
41.80	0.38	0.57	0.67*	2.14	0.00	2.14
41.85	0.38	0.57	0.67*	2.13	0.00	2.13
41.90	0.38	0.57	0.67*	2.13	0.00	2.13
41.95	0.38	0.57	0.67*	2.12	0.00	2.12
42.00	0.38	0.57	0.67*	2.11	0.00	2.11
42.05	0.38	0.57	0.67*	2.10	0.00	2.10
42.10	0.38	0.57	0.67*	2.10	0.00	2.10
42.15	0.38	0.57	0.67*	2.09	0.00	2.09
42.20	0.38	0.57	0.67*	2.08	0.00	2.08
42.25	0.38	0.57	0.67*	2.07	0.00	2.07
42.30	0.38	0.57	0.67*	2.06	0.00	2.06
42.35	0.38	0.57	0.67*	2.06	0.00	2.06
42.40	0.38	0.57	0.67*	2.05	0.00	2.05
42.45	0.38	0.57	0.67*	2.04	0.00	2.04
42.50	0.38	0.57	0.67*	2.03	0.00	2.03
42.55	0.38	0.57	0.67*	2.03	0.00	2.03
42.60	0.38	0.57	0.67*	2.02	0.00	2.02
42.65	0.38	0.57	0.67*	2.01	0.00	2.01
42.70	0.38	0.57	0.67*	2.00	0.00	2.00
42.75	0.38	0.57	0.67*	2.00	0.00	2.00
42.80	0.38	0.57	0.67*	1.99	0.00	1.99
42.85	0.38	0.57	0.67*	1.98	0.00	1.98
42.90	0.38	0.57	0.67*	1.97	0.00	1.97
42.95	0.38	0.57	0.67*	1.96	0.00	1.96
43.00	0.38	0.57	0.67*	1.96	0.00	1.96
43.05	0.38	0.56	0.67*	1.95	0.00	1.95
43.10	0.38	0.56	0.67*	1.94	0.00	1.94
43.15	0.38	0.56	0.67*	1.93	0.00	1.93
43.20	0.38	0.56	0.67*	1.93	0.00	1.93
43.25	0.38	0.56	0.67*	1.92	0.00	1.92
43.30	0.38	0.56	0.67*	1.91	0.00	1.91
43.35	0.38	0.56	0.67*	1.90	0.00	1.90
43.40	0.38	0.56	0.67*	1.90	0.00	1.90
43.45	0.38	0.56	0.67*	1.89	0.00	1.89
43.50	0.38	0.56	0.67*	1.88	0.00	1.88
43.55	0.38	0.56	0.67*	1.87	0.00	1.87
43.60	0.38	0.56	0.67*	1.86	0.00	1.86
43.65	0.38	0.56	0.67*	1.86	0.00	1.86
43.70	0.38	0.56	0.67*	1.85	0.00	1.85
43.75	0.38	0.56	0.67*	1.84	0.00	1.84
43.80	0.38	0.56	0.67*	1.83	0.00	1.83
43.85	0.37	0.56	0.67*	1.83	0.00	1.83
43.90	0.37	0.56	0.67*	1.82	0.00	1.82

43.95	0.37	0.56	0.67*	1.81	0.00	1.81
44.00	0.37	0.56	0.67*	1.80	0.00	1.80
44.05	0.37	0.56	0.67*	1.79	0.00	1.79
44.10	0.37	0.56	0.67*	1.79	0.00	1.79
44.15	0.37	0.56	0.67*	1.78	0.00	1.78
44.20	0.37	0.56	0.67*	1.77	0.00	1.77
44.25	0.37	0.56	0.67*	1.76	0.00	1.76
44.30	0.37	0.56	0.67*	1.76	0.00	1.76
44.35	0.37	0.56	0.67*	1.75	0.00	1.75
44.40	0.37	0.56	0.67*	1.74	0.00	1.74
44.45	0.37	0.56	0.67*	1.73	0.00	1.73
44.50	0.37	0.56	0.67*	1.73	0.00	1.73
44.55	0.37	0.56	0.67*	1.72	0.00	1.72
44.60	0.37	0.56	0.67*	1.71	0.00	1.71
44.65	0.37	0.56	0.67*	1.70	0.00	1.70
44.70	0.37	0.56	0.67*	1.69	0.00	1.69
44.75	0.37	0.55	0.67*	1.69	0.00	1.69
44.80	0.37	0.55	0.67*	1.68	0.00	1.68
44.85	0.37	0.55	0.67*	1.67	0.00	1.67
44.90	0.37	0.55	0.67*	1.66	0.00	1.66
44.95	0.37	0.55	0.67*	1.66	0.00	1.66
45.00	0.37	0.55	0.67*	1.65	0.00	1.65
45.05	0.38	0.55	0.69*	1.64	0.00	1.64
45.10	0.39	0.55	0.71*	1.63	0.00	1.63
45.15	0.40	0.55	0.73*	1.63	0.00	1.63
45.20	0.41	0.55	0.75*	1.62	0.00	1.62
45.25	0.43	0.55	0.78*	1.61	0.00	1.61
45.30	0.45	0.55	0.81*	1.61	0.00	1.61
45.35	0.47	0.55	0.86*	1.60	0.00	1.60
45.40	0.53	0.55	0.97*	1.60	0.00	1.60
45.45	2.30	0.55	4.18	1.60	0.00	1.60
45.50	2.30	0.55	4.18	1.60	0.00	1.60
45.55	2.30	0.55	4.18	1.60	0.00	1.60
45.60	2.30	0.55	4.18	1.60	0.00	1.60
45.65	2.30	0.55	4.18	1.60	0.00	1.60
45.70	2.30	0.55	4.19	1.60	0.00	1.60
45.75	2.30	0.55	4.19	1.60	0.00	1.60
45.80	2.30	0.55	4.19	1.60	0.00	1.60
45.85	2.30	0.55	4.19	1.60	0.00	1.60
45.90	2.30	0.55	4.20	1.60	0.00	1.60
45.95	2.30	0.55	4.20	1.60	0.00	1.60
46.00	2.30	0.55	4.20	1.60	0.00	1.60
46.05	2.30	0.55	4.20	1.60	0.00	1.60
46.10	2.30	0.55	4.20	1.60	0.00	1.60
46.15	2.30	0.55	4.21	1.60	0.00	1.60
46.20	2.30	0.55	4.21	1.60	0.00	1.60
46.25	2.30	0.55	4.21	1.60	0.00	1.60
46.30	2.30	0.55	4.21	1.60	0.00	1.60
46.35	2.30	0.55	4.21	1.60	0.00	1.60
46.40	2.30	0.55	4.22	1.60	0.00	1.60
46.45	2.30	0.55	4.22	1.60	0.00	1.60
46.50	2.30	0.54	4.22	1.60	0.00	1.60
46.55	2.30	0.54	4.22	1.60	0.00	1.60
46.60	2.30	0.54	4.23	1.60	0.00	1.60
46.65	2.30	0.54	4.23	1.60	0.00	1.60
46.70	2.30	0.54	4.23	1.60	0.00	1.60
46.75	2.30	0.54	4.23	1.60	0.00	1.60
46.80	2.30	0.54	4.23	1.60	0.00	1.60
46.85	2.30	0.54	4.24	1.60	0.00	1.60
46.90	2.30	0.54	4.24	1.60	0.00	1.60
46.95	2.30	0.54	4.24	1.60	0.00	1.60
47.00	2.30	0.54	4.24	1.60	0.00	1.60
47.05	2.30	0.54	4.25	1.60	0.00	1.60
47.10	2.30	0.54	4.25	1.60	0.00	1.60
47.15	2.30	0.54	4.25	1.60	0.00	1.60
47.20	2.30	0.54	4.25	1.60	0.00	1.60
47.25	2.30	0.54	4.26	1.60	0.00	1.60
47.30	2.30	0.54	4.26	1.60	0.00	1.60
47.35	2.30	0.54	4.26	1.60	0.00	1.60
47.40	2.30	0.54	4.26	1.60	0.00	1.60
47.45	2.30	0.54	4.26	1.60	0.00	1.60
47.50	2.30	0.54	4.27	1.60	0.00	1.60
47.55	2.30	0.54	4.27	1.60	0.00	1.60
47.60	2.30	0.54	4.27	1.60	0.00	1.60
47.65	2.30	0.54	4.27	1.60	0.00	1.60
47.70	2.30	0.54	4.28	1.60	0.00	1.60
47.75	2.30	0.54	4.28	1.60	0.00	1.60
47.80	2.30	0.54	4.28	1.60	0.00	1.60
47.85	2.30	0.54	4.28	1.60	0.00	1.60
47.90	2.30	0.54	4.28	1.60	0.00	1.60
47.95	2.30	0.54	4.29	1.60	0.00	1.60
48.00	2.30	0.54	4.29	1.60	0.00	1.60
48.05	2.30	0.54	4.29	1.60	0.00	1.60
48.10	2.30	0.54	4.29	1.60	0.00	1.60
48.15	2.30	0.54	4.30	1.60	0.00	1.60
48.20	2.30	0.54	4.30	1.60	0.00	1.60
48.25	2.30	0.53	4.30	1.60	0.00	1.60
48.30	2.30	0.53	4.30	1.60	0.00	1.60
48.35	2.30	0.53	4.31	1.60	0.00	1.60
48.40	2.30	0.53	4.31	1.60	0.00	1.60
48.45	2.30	0.53	4.31	1.60	0.00	1.60
48.50	2.30	0.53	4.31	1.60	0.00	1.60
48.55	2.30	0.53	4.31	1.60	0.00	1.60
48.60	2.30	0.53	4.32	1.60	0.00	1.60
48.65	2.30	0.53	4.32	1.60	0.00	1.60
48.70	2.30	0.53	4.32	1.60	0.00	1.60
48.75	2.30	0.53	4.32	1.60	0.00	1.60
48.80	2.30	0.53	4.33	1.60	0.00	1.60
48.85	2.31	0.53	4.35	1.60	0.00	1.60
48.90	2.31	0.53	4.36	1.60	0.00	1.60
48.95	2.31	0.53	4.36	1.60	0.00	1.60
49.00	2.31	0.53	4.36	1.60	0.00	1.60
49.05	2.31	0.53	4.36	1.60	0.00	1.60
49.10	2.31	0.53	4.36	1.60	0.00	1.60
49.15	2.31	0.53	4.36	1.60	0.00	1.60
49.20	2.31	0.53	4.37	1.60	0.00	1.60
49.25	2.31	0.53	4.37	1.60	0.00	1.60
49.30	2.31	0.53	4.37	1.60	0.00	1.60
49.35	2.31	0.53	4.37	1.60	0.00	1.60
49.40	2.31	0.53	4.37	1.60	0.00	1.60
49.45	2.31	0.53	4.37	1.60	0.00	1.60
49.50	2.31	0.53	4.38	1.60	0.00	1.60
49.55	2.31	0.53	4.38	1.60	0.00	1.60
49.60	2.31	0.53	4.38	1.60	0.00	1.60
49.65	2.31	0.53	4.38	1.60	0.00	1.60
49.70	2.31	0.53	4.38	1.60	0.00	1.60
49.75	2.31	0.53	4.39	1.60	0.00	1.60
49.80	2.31	0.53	4.39	1.60	0.00	1.60
49.85	2.31	0.53	4.39	1.60	0.00	1.60
49.90	2.31	0.53	4.39	1.60	0.00	1.60
49.95	2.31	0.53	4.39	1.60	0.00	1.60
50.00	2.31	0.52	4.39	1.60	0.00	1.60
50.05	2.31	0.52	4.40	1.60	0.00	1.60
50.10	2.31	0.52	4.40	1.60	0.00	1.60
50.15	2.31	0.52	4.40	1.60	0.00	1.60
50.20	2.31	0.52	4.40	1.60	0.00	1.60
50.25	2.30	0.52	4.40	1.60	0.00	1.60
50.30	2.30	0.52	4.40	1.60	0.00	1.60
50.35	2.30	0.52	4.41	1.60	0.00	1.60
50.40	2.30	0.52	4.41	1.60	0.00	1.60
50.45	2.30	0.52	4.41	1.60	0.00	1.60
50.50	2.30	0.52	4.41	1.60	0.00	1.60
50.55	2.30	0.52	4.41	1.60	0.00	1.60
50.60	2.30	0.52	4.41	1.60	0.00	1.60
50.65	2.30	0.52	4.42	1.60	0.00	1.60
50.70	2.30	0.52	4.42	1.60	0.00	1.60
50.75	2.30	0.52	4.42	1.60	0.00	1.60
50.80	2.30	0.52	4.42	1.60	0.00	1.60

50.85	2.30	0.52	4.42	1.60	0.00	1.60
50.90	2.30	0.52	4.43	1.60	0.00	1.60
50.95	2.30	0.52	4.43	1.60	0.00	1.60
51.00	2.30	0.52	4.43	1.60	0.00	1.60
51.05	2.30	0.52	4.43	1.60	0.00	1.60
51.10	2.30	0.52	4.43	1.60	0.00	1.60
51.15	2.30	0.52	4.43	1.60	0.00	1.60
51.20	2.30	0.52	4.44	1.60	0.00	1.60
51.25	2.30	0.52	4.44	1.60	0.00	1.60
51.30	2.30	0.52	4.44	1.60	0.00	1.60
51.35	2.30	0.52	4.44	1.60	0.00	1.60
51.40	2.30	0.52	4.44	1.60	0.00	1.60
51.45	2.30	0.52	4.44	1.60	0.00	1.60
51.50	2.30	0.52	4.45	1.60	0.00	1.60
51.55	2.30	0.52	4.45	1.60	0.00	1.60
51.60	2.30	0.52	4.45	1.60	0.00	1.60
51.65	2.30	0.52	4.45	1.60	0.00	1.60
51.70	2.29	0.52	4.45	1.60	0.00	1.60
51.75	2.29	0.52	4.46	1.60	0.00	1.60
51.80	2.29	0.51	4.46	1.60	0.00	1.60
51.85	2.29	0.51	4.46	1.60	0.00	1.60
51.90	2.29	0.51	4.46	1.60	0.00	1.60
51.95	2.29	0.51	4.46	1.60	0.00	1.60
52.00	2.29	0.51	4.46	1.60	0.00	1.60
52.05	2.29	0.51	4.47	1.60	0.00	1.60
52.10	2.29	0.51	4.47	1.60	0.00	1.60
52.15	2.29	0.51	4.47	1.60	0.00	1.60
52.20	2.29	0.51	4.47	1.60	0.00	1.60
52.25	2.29	0.51	4.47	1.60	0.00	1.60
52.30	2.29	0.51	4.48	1.60	0.00	1.60
52.35	2.29	0.51	4.48	1.60	0.00	1.60
52.40	2.29	0.51	4.48	1.60	0.00	1.60
52.45	2.29	0.51	4.48	1.60	0.00	1.60
52.50	2.29	0.51	4.48	1.60	0.00	1.60
52.55	2.29	0.51	4.48	1.60	0.00	1.60
52.60	2.29	0.51	4.49	1.60	0.00	1.60
52.65	2.29	0.51	4.49	1.60	0.00	1.60
52.70	2.29	0.51	4.49	1.60	0.00	1.60
52.75	2.29	0.51	4.49	1.60	0.00	1.60
52.80	2.29	0.51	4.49	1.60	0.00	1.60
52.85	2.29	0.51	4.50	1.60	0.00	1.60
52.90	2.29	0.51	4.50	1.60	0.00	1.60
52.95	2.29	0.51	4.50	1.60	0.00	1.60
53.00	2.29	0.51	4.50	1.60	0.00	1.60
53.05	2.29	0.51	4.50	1.60	0.00	1.60
53.10	2.29	0.51	4.50	1.60	0.00	1.60
53.15	2.29	0.51	4.51	1.60	0.00	1.60
53.20	2.28	0.51	4.51	1.60	0.00	1.60
53.25	2.28	0.51	4.51	1.60	0.00	1.60
53.30	2.28	0.51	4.51	1.60	0.00	1.60
53.35	2.28	0.51	4.51	1.60	0.00	1.60
53.40	2.28	0.51	4.52	1.60	0.00	1.60
53.45	2.28	0.51	4.52	1.60	0.00	1.60
53.50	2.28	0.51	4.52	1.60	0.00	1.60
53.55	2.28	0.50	4.52	1.60	0.00	1.60
53.60	2.28	0.50	4.52	1.60	0.00	1.60
53.65	2.28	0.50	4.53	1.60	0.00	1.60
53.70	2.28	0.50	4.53	1.60	0.00	1.60
53.75	2.28	0.50	4.53	1.60	0.00	1.60
53.80	2.28	0.50	4.53	1.60	0.00	1.60
53.85	2.28	0.50	4.53	1.60	0.00	1.60
53.90	2.28	0.50	4.53	1.60	0.00	1.60
53.95	2.28	0.50	4.54	1.60	0.00	1.60
54.00	2.28	0.50	4.54	1.60	0.00	1.60
54.05	2.28	0.50	4.54	1.60	0.00	1.60
54.10	2.28	0.50	4.54	1.60	0.00	1.60
54.15	2.28	0.50	4.54	1.60	0.00	1.60
54.20	2.28	0.50	4.55	1.60	0.00	1.60
54.25	2.28	0.50	4.55	1.60	0.00	1.60
54.30	2.28	0.50	4.55	1.60	0.00	1.60
54.35	2.28	0.50	4.55	1.60	0.00	1.60
54.40	2.28	0.50	4.55	1.60	0.00	1.60
54.45	2.28	0.50	4.56	1.60	0.00	1.60
54.50	2.28	0.50	4.56	1.60	0.00	1.60
54.55	2.28	0.50	4.56	1.60	0.00	1.60
54.60	2.28	0.50	4.56	1.60	0.00	1.60
54.65	2.28	0.50	4.56	1.60	0.00	1.60
54.70	0.51	0.50	1.01	1.60	0.00	1.60
54.75	0.46	0.50	0.93*	1.59	0.00	1.59
54.80	0.44	0.50	0.89*	1.59	0.00	1.59
54.85	0.42	0.50	0.85*	1.59	0.00	1.59
54.90	0.41	0.50	0.83*	1.58	0.00	1.58
54.95	0.40	0.50	0.81*	1.58	0.00	1.58
55.00	0.39	0.50	0.79*	1.57	0.00	1.57
55.05	0.40	0.50	0.80*	1.56	0.00	1.56
55.10	0.41	0.50	0.83*	1.56	0.00	1.56
55.15	0.42	0.50	0.85*	1.55	0.00	1.55
55.20	0.44	0.50	0.88*	1.55	0.00	1.55
55.25	0.46	0.50	0.92*	1.54	0.00	1.54
55.30	0.49	0.49	0.99*	1.54	0.00	1.54
55.35	2.27	0.49	4.59	1.54	0.00	1.54
55.40	2.27	0.49	4.59	1.54	0.00	1.54
55.45	2.27	0.49	4.59	1.54	0.00	1.54
55.50	2.27	0.49	4.60	1.54	0.00	1.54
55.55	2.27	0.49	4.60	1.54	0.00	1.54
55.60	2.27	0.49	4.60	1.54	0.00	1.54
55.65	2.27	0.49	4.60	1.54	0.00	1.54
55.70	2.27	0.49	4.60	1.54	0.00	1.54
55.75	2.27	0.49	4.61	1.54	0.00	1.54
55.80	2.27	0.49	4.61	1.54	0.00	1.54
55.85	2.27	0.49	4.61	1.54	0.00	1.54
55.90	2.27	0.49	4.61	1.54	0.00	1.54
55.95	2.27	0.49	4.61	1.54	0.00	1.54
56.00	2.27	0.49	4.62	1.54	0.00	1.54
56.05	2.27	0.49	4.62	1.54	0.00	1.54
56.10	2.27	0.49	4.62	1.54	0.00	1.54
56.15	2.27	0.49	4.62	1.54	0.00	1.54
56.20	2.26	0.49	4.62	1.54	0.00	1.54
56.25	2.26	0.49	4.63	1.54	0.00	1.54
56.30	2.26	0.49	4.63	1.54	0.00	1.54
56.35	2.26	0.49	4.63	1.54	0.00	1.54
56.40	2.26	0.49	4.63	1.54	0.00	1.54
56.45	2.26	0.49	4.63	1.54	0.00	1.54
56.50	2.26	0.49	4.64	1.54	0.00	1.54
56.55	2.26	0.49	4.64	1.54	0.00	1.54
56.60	2.26	0.49	4.64	1.54	0.00	1.54
56.65	2.26	0.49	4.64	1.54	0.00	1.54
56.70	2.26	0.49	4.64	1.54	0.00	1.54
56.75	2.26	0.49	4.65	1.54	0.00	1.54
56.80	2.26	0.49	4.65	1.54	0.00	1.54
56.85	2.26	0.49	4.65	1.54	0.00	1.54
56.90	2.26	0.49	4.65	1.54	0.00	1.54
56.95	2.26	0.49	4.65	1.54	0.00	1.54
57.00	2.26	0.49	4.66	1.54	0.00	1.54
57.05	2.26	0.49	4.66	1.54	0.00	1.54
57.10	2.26	0.48	4.66	1.54	0.00	1.54
57.15	2.26	0.48	4.66	1.54	0.00	1.54
57.20	2.26	0.48	4.66	1.54	0.00	1.54
57.25	2.26	0.48	4.67	1.54	0.00	1.54
57.30	2.26	0.48	4.67	1.54	0.00	1.54
57.35	2.26	0.48	4.67	1.54	0.00	1.54
57.40	2.26	0.48	4.67	1.54	0.00	1.54
57.45	2.26	0.48	4.67	1.54	0.00	1.54
57.50	2.26	0.48	4.68	1.54	0.00	1.54
57.55	2.26	0.48	4.68	1.54	0.00	1.54
57.60	2.26	0.48	4.68	1.54	0.00	1.54
57.65	2.26	0.48	4.68	1.54	0.00	1.54
57.70	2.26	0.48	4.69	1.54	0.00	1.54

57.75	2.25	0.48	4.69	1.54	0.00	1.54
57.80	2.25	0.48	4.69	1.54	0.00	1.54
57.85	2.25	0.48	4.69	1.54	0.00	1.54
57.90	2.25	0.48	4.69	1.54	0.00	1.54
57.95	2.25	0.48	4.70	1.54	0.00	1.54
58.00	2.25	0.48	4.70	1.54	0.00	1.54
58.05	2.25	0.48	4.70	1.54	0.00	1.54
58.10	2.25	0.48	4.70	1.54	0.00	1.54
58.15	2.25	0.48	4.70	1.54	0.00	1.54
58.20	2.25	0.48	4.71	1.54	0.00	1.54
58.25	2.25	0.48	4.71	1.54	0.00	1.54
58.30	2.25	0.48	4.71	1.54	0.00	1.54
58.35	2.25	0.48	4.71	1.54	0.00	1.54
58.40	2.25	0.48	4.71	1.54	0.00	1.54
58.45	2.25	0.48	4.72	1.54	0.00	1.54
58.50	2.25	0.48	4.72	1.54	0.00	1.54
58.55	2.25	0.48	4.72	1.54	0.00	1.54
58.60	2.25	0.48	4.72	1.54	0.00	1.54
58.65	2.25	0.48	4.72	1.54	0.00	1.54
58.70	2.25	0.48	4.73	1.54	0.00	1.54
58.75	2.25	0.48	4.73	1.54	0.00	1.54
58.80	2.25	0.48	4.73	1.54	0.00	1.54
58.85	2.25	0.47	4.73	1.54	0.00	1.54
58.90	2.25	0.47	4.74	1.54	0.00	1.54
58.95	2.25	0.47	4.74	1.54	0.00	1.54
59.00	2.25	0.47	4.74	1.54	0.00	1.54
59.05	2.25	0.47	4.74	1.54	0.00	1.54
59.10	2.25	0.47	4.74	1.54	0.00	1.54
59.15	2.25	0.47	4.75	1.54	0.00	1.54
59.20	2.25	0.47	4.75	1.54	0.00	1.54
59.25	2.25	0.47	4.75	1.54	0.00	1.54
59.30	2.24	0.47	4.75	1.54	0.00	1.54
59.35	2.24	0.47	4.75	1.54	0.00	1.54
59.40	2.24	0.47	4.76	1.54	0.00	1.54
59.45	2.24	0.47	4.76	1.54	0.00	1.54
59.50	2.24	0.47	4.76	1.54	0.00	1.54
59.55	2.24	0.47	4.76	1.54	0.00	1.54
59.60	2.24	0.47	4.77	1.54	0.00	1.54
59.65	2.24	0.47	4.77	1.54	0.00	1.54
59.70	2.24	0.47	4.77	1.54	0.00	1.54
59.75	2.24	0.47	4.77	1.54	0.00	1.54
59.80	2.24	0.47	4.77	1.54	0.00	1.54
59.85	2.24	0.47	4.78	1.54	0.00	1.54
59.90	2.24	0.47	4.78	1.54	0.00	1.54
59.95	2.24	0.47	4.78	1.54	0.00	1.54
60.00	2.24	0.47	4.78	1.54	0.00	1.54
60.05	2.24	0.47	4.79	1.54	0.00	1.54
60.10	2.24	0.47	4.79	1.54	0.00	1.54
60.15	2.24	0.47	4.79	1.54	0.00	1.54
60.20	2.24	0.47	4.79	1.54	0.00	1.54
60.25	2.24	0.47	4.79	1.54	0.00	1.54
60.30	2.24	0.47	4.80	1.54	0.00	1.54
60.35	2.24	0.47	4.80	1.54	0.00	1.54
60.40	2.24	0.47	4.80	1.54	0.00	1.54
60.45	2.24	0.47	4.80	1.54	0.00	1.54
60.50	2.24	0.47	4.81	1.54	0.00	1.54
60.55	2.24	0.47	4.81	1.54	0.00	1.54
60.60	2.24	0.46	4.81	1.54	0.00	1.54
60.65	2.24	0.46	4.81	1.54	0.00	1.54
60.70	2.24	0.46	4.81	1.54	0.00	1.54
60.75	2.24	0.46	4.82	1.54	0.00	1.54
60.80	2.24	0.46	4.82	1.54	0.00	1.54
60.85	2.23	0.46	4.82	1.54	0.00	1.54
60.90	2.23	0.46	4.82	1.54	0.00	1.54
60.95	2.23	0.46	4.83	1.54	0.00	1.54
61.00	2.23	0.46	4.83	1.54	0.00	1.54
61.05	2.23	0.46	4.83	1.54	0.00	1.54
61.10	2.23	0.46	4.83	1.54	0.00	1.54
61.15	2.23	0.46	4.83	1.54	0.00	1.54
61.20	2.23	0.46	4.84	1.54	0.00	1.54
61.25	2.23	0.46	4.84	1.54	0.00	1.54
61.30	2.23	0.46	4.84	1.54	0.00	1.54
61.35	2.23	0.46	4.84	1.54	0.00	1.54
61.40	2.23	0.46	4.85	1.54	0.00	1.54
61.45	2.23	0.46	4.85	1.54	0.00	1.54
61.50	2.23	0.46	4.85	1.54	0.00	1.54
61.55	2.23	0.46	4.85	1.54	0.00	1.54
61.60	2.23	0.46	4.85	1.54	0.00	1.54
61.65	2.23	0.46	4.86	1.54	0.00	1.54
61.70	2.23	0.46	4.86	1.54	0.00	1.54
61.75	2.23	0.46	4.86	1.54	0.00	1.54
61.80	2.23	0.46	4.86	1.54	0.00	1.54
61.85	2.23	0.46	4.87	1.54	0.00	1.54
61.90	2.23	0.46	4.87	1.54	0.00	1.54
61.95	2.23	0.46	4.87	1.54	0.00	1.54
62.00	2.23	0.46	4.87	1.54	0.00	1.54
62.05	2.23	0.46	4.88	1.54	0.00	1.54
62.10	2.23	0.46	4.88	1.54	0.00	1.54
62.15	2.23	0.46	4.88	1.54	0.00	1.54
62.20	2.23	0.46	4.88	1.54	0.00	1.54
62.25	2.23	0.46	4.88	1.54	0.00	1.54
62.30	2.23	0.46	4.89	1.54	0.00	1.54
62.35	2.23	0.46	4.89	1.54	0.00	1.54
62.40	2.22	0.45	4.89	1.54	0.00	1.54
62.45	2.22	0.45	4.89	1.54	0.00	1.54
62.50	2.22	0.45	4.90	1.54	0.00	1.54
62.55	2.22	0.45	4.90	1.54	0.00	1.54
62.60	2.22	0.45	4.90	1.54	0.00	1.54
62.65	2.22	0.45	4.90	1.54	0.00	1.54
62.70	2.22	0.45	4.91	1.54	0.00	1.54
62.75	2.22	0.45	4.91	1.54	0.00	1.54
62.80	2.22	0.45	4.91	1.54	0.00	1.54
62.85	2.22	0.45	4.91	1.54	0.00	1.54
62.90	2.22	0.45	4.91	1.54	0.00	1.54
62.95	2.22	0.45	4.92	1.54	0.00	1.54
63.00	2.22	0.45	4.92	1.54	0.00	1.54
63.05	2.22	0.45	4.92	1.54	0.00	1.54
63.10	2.22	0.45	4.92	1.54	0.00	1.54
63.15	2.22	0.45	4.93	1.54	0.00	1.54
63.20	2.22	0.45	4.93	1.54	0.00	1.54
63.25	2.22	0.45	4.93	1.54	0.00	1.54
63.30	2.22	0.45	4.93	1.54	0.00	1.54
63.35	2.22	0.45	4.94	1.54	0.00	1.54
63.40	2.22	0.45	4.94	1.54	0.00	1.54
63.45	2.22	0.45	4.94	1.54	0.00	1.54
63.50	2.22	0.45	4.94	1.54	0.00	1.54
63.55	2.22	0.45	4.95	1.54	0.00	1.54
63.60	2.22	0.45	4.95	1.54	0.00	1.54
63.65	2.22	0.45	4.95	1.54	0.00	1.54
63.70	2.22	0.45	4.95	1.54	0.00	1.54
63.75	2.22	0.45	4.96	1.54	0.00	1.54
63.80	2.22	0.45	4.96	1.54	0.00	1.54
63.85	2.22	0.45	4.96	1.54	0.00	1.54
63.90	2.22	0.45	4.96	1.54	0.00	1.54
63.95	2.22	0.45	4.97	1.54	0.00	1.54
64.00	0.48	0.45	1.07	1.54	0.00	1.54
64.05	0.48	0.45	1.07	1.54	0.00	1.54
64.10	0.47	0.45	1.06	1.53	0.00	1.53
64.15	0.47	0.45	1.06	1.53	0.00	1.53
64.20	0.47	0.44	1.06	1.53	0.00	1.53
64.25	0.47	0.44	1.06	1.53	0.00	1.53
64.30	0.47	0.44	1.05	1.52	0.00	1.52
64.35	0.47	0.44	1.05	1.52	0.00	1.52
64.40	0.47	0.44	1.05	1.52	0.00	1.52
64.45	0.46	0.44	1.05	1.52	0.00	1.52
64.50	0.46	0.44	1.04	1.51	0.00	1.51
64.55	0.46	0.44	1.04	1.51	0.00	1.51
64.60	0.46	0.44	1.04	1.51	0.00	1.51

64.65	0.46	0.44	1.04	1.51	0.00	1.51
64.70	0.46	0.44	1.04	1.50	0.00	1.50
64.75	0.46	0.44	1.04	1.50	0.00	1.50
64.80	0.46	0.44	1.03	1.50	0.00	1.50
64.85	0.46	0.44	1.03	1.50	0.00	1.50
64.90	0.45	0.44	1.03	1.49	0.00	1.49
64.95	0.45	0.44	1.03	1.49	0.00	1.49
65.00	0.45	0.44	1.03	1.49	0.00	1.49
65.05	0.44	0.44	1.01	1.49	0.00	1.49
65.10	0.44	0.44	1.00*	1.48	0.00	1.48
65.15	0.43	0.44	0.98*	1.48	0.00	1.48
65.20	0.43	0.44	0.97*	1.48	0.00	1.48
65.25	0.42	0.44	0.96*	1.47	0.00	1.47
65.30	0.42	0.44	0.95*	1.47	0.00	1.47
65.35	0.41	0.44	0.94*	1.47	0.00	1.47
65.40	0.41	0.44	0.93*	1.46	0.00	1.46
65.45	0.41	0.44	0.93*	1.46	0.00	1.46
65.50	0.40	0.44	0.92*	1.46	0.00	1.46
65.55	0.40	0.44	0.91*	1.45	0.00	1.45
65.60	0.40	0.44	0.90*	1.45	0.00	1.45
65.65	0.39	0.44	0.90*	1.44	0.00	1.44
65.70	0.39	0.44	0.89*	1.44	0.00	1.44
65.75	0.39	0.44	0.89*	1.44	0.00	1.44
65.80	0.38	0.44	0.88*	1.43	0.00	1.43
65.85	0.38	0.44	0.87*	1.43	0.00	1.43
65.90	0.38	0.44	0.87*	1.42	0.00	1.42
65.95	0.37	0.43	0.86*	1.42	0.00	1.42
66.00	0.37	0.43	0.86*	1.41	0.00	1.41
66.05	0.37	0.43	0.85*	1.41	0.00	1.41
66.10	0.37	0.43	0.85*	1.40	0.00	1.40
66.15	0.37	0.43	0.84*	1.40	0.00	1.40
66.20	0.36	0.43	0.84*	1.39	0.00	1.39
66.25	0.36	0.43	0.83*	1.38	0.00	1.38
66.30	0.36	0.43	0.83*	1.38	0.00	1.38
66.35	0.36	0.43	0.82*	1.37	0.00	1.37
66.40	0.35	0.43	0.82*	1.37	0.00	1.37
66.45	0.35	0.43	0.81*	1.36	0.00	1.36
66.50	0.35	0.43	0.81*	1.36	0.00	1.36
66.55	0.35	0.43	0.80*	1.35	0.00	1.35
66.60	0.35	0.43	0.80*	1.34	0.00	1.34
66.65	0.34	0.43	0.80*	1.34	0.00	1.34
66.70	0.34	0.43	0.79*	1.33	0.00	1.33
66.75	0.34	0.43	0.79*	1.33	0.00	1.33
66.80	0.34	0.43	0.78*	1.32	0.00	1.32
66.85	0.34	0.43	0.78*	1.31	0.00	1.31
66.90	0.33	0.43	0.78*	1.31	0.00	1.31
66.95	0.33	0.43	0.77*	1.30	0.00	1.30
67.00	0.33	0.43	0.77*	1.29	0.00	1.29
67.05	0.33	0.43	0.76*	1.28	0.00	1.28
67.10	0.33	0.43	0.76*	1.28	0.00	1.28
67.15	0.32	0.43	0.76*	1.27	0.00	1.27
67.20	0.32	0.43	0.75*	1.26	0.00	1.26
67.25	0.32	0.43	0.75*	1.26	0.00	1.26
67.30	0.32	0.43	0.75*	1.25	0.00	1.25
67.35	0.32	0.43	0.74*	1.24	0.00	1.24
67.40	0.32	0.43	0.74*	1.23	0.00	1.23
67.45	0.31	0.43	0.74*	1.22	0.00	1.22
67.50	0.31	0.43	0.73*	1.22	0.00	1.22
67.55	0.31	0.43	0.73*	1.21	0.00	1.21
67.60	0.31	0.43	0.73*	1.20	0.00	1.20
67.65	0.31	0.43	0.72*	1.19	0.00	1.19
67.70	0.31	0.43	0.72*	1.18	0.00	1.18
67.75	0.30	0.42	0.72*	1.17	0.00	1.17
67.80	0.30	0.42	0.71*	1.17	0.00	1.17
67.85	0.30	0.42	0.71*	1.16	0.00	1.16
67.90	0.30	0.42	0.71*	1.15	0.00	1.15
67.95	0.30	0.42	0.70*	1.14	0.00	1.14
68.00	0.30	0.42	0.70*	1.13	0.00	1.13
68.05	0.30	0.42	0.70*	1.12	0.00	1.12
68.10	0.29	0.42	0.70*	1.11	0.00	1.11
68.15	0.29	0.42	0.69*	1.10	0.00	1.10
68.20	0.29	0.42	0.69*	1.09	0.00	1.09
68.25	0.29	0.42	0.69*	1.08	0.00	1.08
68.30	0.29	0.42	0.68*	1.07	0.00	1.07
68.35	0.29	0.42	0.68*	1.06	0.00	1.06
68.40	0.29	0.42	0.68*	1.05	0.00	1.05
68.45	0.28	0.42	0.67*	1.04	0.00	1.04
68.50	0.28	0.42	0.67*	1.03	0.00	1.03
68.55	0.28	0.42	0.67*	1.02	0.00	1.02
68.60	0.28	0.42	0.67*	1.01	0.00	1.01
68.65	0.28	0.42	0.66*	1.00	0.00	1.00
68.70	0.28	0.42	0.66*	0.99	0.00	0.99
68.75	0.28	0.42	0.66*	0.98	0.00	0.98
68.80	0.27	0.42	0.66*	0.97	0.00	0.97
68.85	0.27	0.42	0.65*	0.96	0.00	0.96
68.90	0.27	0.42	0.65*	0.95	0.00	0.95
68.95	0.27	0.42	0.65*	0.94	0.00	0.94
69.00	0.27	0.42	0.65*	0.93	0.00	0.93
69.05	0.27	0.42	0.64*	0.91	0.00	0.91
69.10	0.27	0.42	0.64*	0.90	0.00	0.90
69.15	0.27	0.42	0.64*	0.89	0.00	0.89
69.20	0.26	0.42	0.63*	0.88	0.00	0.88
69.25	0.26	0.42	0.63*	0.87	0.00	0.87
69.30	0.26	0.42	0.63*	0.86	0.00	0.86
69.35	0.26	0.42	0.63*	0.85	0.00	0.85
69.40	0.26	0.42	0.62*	0.83	0.00	0.83
69.45	0.26	0.42	0.62*	0.82	0.00	0.82
69.50	0.26	0.42	0.62*	0.81	0.00	0.81
69.55	0.26	0.41	0.62*	0.80	0.00	0.80
69.60	0.25	0.41	0.62*	0.79	0.00	0.79
69.65	0.25	0.41	0.61*	0.78	0.00	0.78
69.70	0.25	0.41	0.61*	0.76	0.00	0.76
69.75	0.25	0.41	0.61*	0.75	0.00	0.75
69.80	0.25	0.41	0.61*	0.74	0.00	0.74
69.85	0.25	0.41	0.60*	0.73	0.00	0.73
69.90	0.25	0.41	0.60*	0.71	0.00	0.71
69.95	0.25	0.41	0.60*	0.70	0.00	0.70
70.00	0.25	0.41	0.60*	0.69	0.00	0.69
70.05	0.25	0.41	0.60*	0.68	0.00	0.68
70.10	0.25	0.41	0.60*	0.66	0.00	0.66
70.15	0.25	0.41	0.61*	0.65	0.00	0.65
70.20	0.25	0.41	0.61*	0.64	0.00	0.64
70.25	0.25	0.41	0.62*	0.63	0.00	0.63
70.30	0.25	0.41	0.62*	0.61	0.00	0.61
70.35	0.26	0.41	0.62*	0.60	0.00	0.60
70.40	0.26	0.41	0.63*	0.59	0.00	0.59
70.45	0.26	0.41	0.63*	0.58	0.00	0.58
70.50	0.26	0.41	0.64*	0.57	0.00	0.57
70.55	0.26	0.41	0.64*	0.56	0.00	0.56
70.60	0.26	0.41	0.65*	0.54	0.00	0.54
70.65	0.27	0.41	0.65*	0.53	0.00	0.53
70.70	0.27	0.41	0.65*	0.52	0.00	0.52
70.75	0.27	0.41	0.66*	0.51	0.00	0.51
70.80	0.27	0.41	0.66*	0.50	0.00	0.50
70.85	0.27	0.41	0.67*	0.49	0.00	0.49
70.90	0.27	0.41	0.67*	0.48	0.00	0.48
70.95	0.28	0.41	0.68*	0.47	0.00	0.47
71.00	0.28	0.41	0.68*	0.46	0.00	0.46
71.05	0.28	0.41	0.69*	0.45	0.00	0.45
71.10	0.28	0.41	0.69*	0.44	0.00	0.44
71.15	0.28	0.41	0.70*	0.43	0.00	0.43
71.20	0.28	0.41	0.70*	0.42	0.00	0.42
71.25	0.29	0.41	0.71*	0.41	0.00	0.41
71.30	0.29	0.40	0.71*	0.40	0.00	0.40
71.35	0.29	0.40	0.72*	0.39	0.00	0.39
71.40	0.29	0.40	0.72*	0.38	0.00	0.38
71.45	0.29	0.40	0.73*	0.37	0.00	0.37
71.50	0.30	0.40	0.73*	0.36	0.00	0.36

71.55	0.30	0.40	0.74*	0.35	0.00	0.35
71.60	0.30	0.40	0.74*	0.34	0.00	0.34
71.65	0.30	0.40	0.75*	0.34	0.00	0.34
71.70	0.30	0.40	0.75*	0.33	0.00	0.33
71.75	0.31	0.40	0.76*	0.32	0.00	0.32
71.80	0.31	0.40	0.76*	0.31	0.00	0.31
71.85	0.31	0.40	0.77*	0.30	0.00	0.30
71.90	0.31	0.40	0.78*	0.30	0.00	0.30
71.95	0.31	0.40	0.78*	0.29	0.00	0.29
72.00	0.32	0.40	0.79*	0.28	0.00	0.28
72.05	0.32	0.40	0.79*	0.27	0.00	0.27
72.10	0.32	0.40	0.80*	0.27	0.00	0.27
72.15	0.32	0.40	0.81*	0.26	0.00	0.26
72.20	0.32	0.40	0.81*	0.25	0.00	0.25
72.25	0.33	0.40	0.82*	0.25	0.00	0.25
72.30	0.33	0.40	0.82*	0.24	0.00	0.24
72.35	0.33	0.40	0.83*	0.24	0.00	0.24
72.40	0.33	0.40	0.84*	0.23	0.00	0.23
72.45	0.34	0.40	0.84*	0.22	0.00	0.22
72.50	0.34	0.40	0.85*	0.22	0.00	0.22
72.55	0.34	0.40	0.86*	0.21	0.00	0.21
72.60	0.34	0.40	0.87*	0.21	0.00	0.21
72.65	0.35	0.40	0.87*	0.20	0.00	0.20
72.70	0.35	0.40	0.88*	0.20	0.00	0.20
72.75	0.35	0.40	0.89*	0.19	0.00	0.19
72.80	0.36	0.40	0.90*	0.19	0.00	0.19
72.85	0.36	0.40	0.90*	0.18	0.00	0.18
72.90	0.36	0.40	0.91*	0.18	0.00	0.18
72.95	0.36	0.40	0.91*	0.17	0.00	0.17
73.00	0.36	0.40	0.91*	0.17	0.00	0.17
73.05	0.36	0.40	0.91*	0.16	0.00	0.16
73.10	0.36	0.39	0.91*	0.16	0.00	0.16
73.15	0.36	0.39	0.91*	0.15	0.00	0.15
73.20	0.36	0.39	0.91*	0.15	0.00	0.15
73.25	0.36	0.39	0.92*	0.15	0.00	0.15
73.30	0.36	0.39	0.92*	0.14	0.00	0.14
73.35	0.36	0.39	0.92*	0.14	0.00	0.14
73.40	0.36	0.39	0.92*	0.13	0.00	0.13
73.45	0.36	0.39	0.92*	0.13	0.00	0.13
73.50	0.36	0.39	0.92*	0.12	0.00	0.12
73.55	0.36	0.39	0.92*	0.12	0.00	0.12
73.60	0.36	0.39	0.92*	0.12	0.00	0.12
73.65	0.36	0.39	0.93*	0.11	0.00	0.11
73.70	0.36	0.39	0.93*	0.11	0.00	0.11
73.75	0.36	0.39	0.93*	0.10	0.00	0.10
73.80	0.36	0.39	0.93*	0.10	0.00	0.10
73.85	0.36	0.39	0.93*	0.09	0.00	0.09
73.90	0.36	0.39	0.93*	0.09	0.00	0.09
73.95	0.36	0.39	0.93*	0.09	0.00	0.09
74.00	0.36	0.39	0.94*	0.08	0.00	0.08
74.05	0.36	0.39	0.94*	0.08	0.00	0.08
74.10	0.36	0.39	0.94*	0.07	0.00	0.07
74.15	0.36	0.39	0.94*	0.07	0.00	0.07
74.20	0.36	0.39	0.94*	0.07	0.00	0.07
74.25	0.36	0.39	0.94*	0.06	0.00	0.06
74.30	0.36	0.39	0.94*	0.06	0.00	0.06
74.35	0.36	0.39	0.94*	0.05	0.00	0.05
74.40	0.36	0.39	0.94*	0.05	0.00	0.05
74.45	0.36	0.39	0.94*	0.05	0.00	0.05
74.50	0.36	0.39	0.94*	0.04	0.00	0.04
74.55	0.36	0.39	0.94*	0.04	0.00	0.04
74.60	0.36	0.39	0.94*	0.03	0.00	0.03
74.65	0.36	0.39	0.94*	0.03	0.00	0.03
74.70	0.36	0.39	0.94*	0.02	0.00	0.02
74.75	0.36	0.39	0.94*	0.02	0.00	0.02
74.80	0.36	0.39	0.94*	0.02	0.00	0.02
74.85	0.36	0.39	0.94*	0.01	0.00	0.01
74.90	0.36	0.38	0.94*	0.01	0.00	0.01
74.95	0.36	0.38	0.94*	0.00	0.00	0.00
75.00	0.36	0.38	0.94*	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Depth = ft, Stress or Pressure = tsf (atm), Unit Weight = pcf, Settlement = in.

CRRm	Cyclic resistance ratio from soils
CSRfs	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRfs
S_sat	Settlement from saturated sands
S_dry	Settlement from dry sands
S_all	Total settlement from saturated and dry sands
NoLiq	No-Liquefy Soils

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Input File Name: E:\VB&B\Woodfin\CPT-1.INT.liq
Title: Woodfin Suites
Subtitle: CPT-1

Surface Elev.=5
Hole No.=CPT-1
Depth of Hole= 75.5 ft
Water Table during Earthquake= 0.0 ft
Water Table during In-Situ Testing= 5.0 ft
Max. Acceleration= 0.5 g
Earthquake Magnitude= 7.1

Input Data:

Surface Elev.=5
Hole No.=CPT-1
Depth of Hole=75.5 ft
Water Table during Earthquake= 0.0 ft
Water Table during In-Situ Testing= 5.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=7.1

1. CPT Calulation Method: Modify Robertson*
2. Settlement Analysis Method: Ishihara / Yoshimine*
3. Fines Correction for Liquefaction: Idriss/Seed (SPT only)
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1
7. Borehole Diameter, Cb= 1
8. Sampeling Method, Cs= 1
9. User request factor of safty (apply to CSR) , User= 1
   Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	qc tsf	fs tsf	gamma pcf	Fines %	D50 mm
0.0	90.5	0.7	100.0	NoLiq	0.5
1.5	104.5	1.9	100.0	NoLiq	0.5
2.5	122.8	1.8	100.0	NoLiq	0.5
3.5	159.1	1.3	100.0	NoLiq	0.5
4.5	63.0	0.9	120.0	NoLiq	0.5
5.5	5.8	0.2	120.0	NoLiq	0.5
6.5	5.6	0.1	120.0	NoLiq	0.5
7.5	13.1	0.2	120.0	NoLiq	0.5
8.5	25.2	0.1	110.0	2.0	0.2
9.5	68.3	0.3	110.0	2.0	0.2
10.5	69.4	0.4	110.0	2.0	0.2
11.5	34.9	0.3	110.0	5.0	0.2
12.5	14.2	0.2	110.0	5.0	0.2
13.5	45.7	0.3	110.0	5.0	0.2
14.5	94.6	0.6	110.0	5.0	0.2
15.5	179.6	1.2	110.0	9.0	0.2
16.5	210.2	1.4	110.0	9.0	0.2
17.5	206.6	1.6	110.0	9.0	0.2
18.5	149.2	1.1	110.0	9.0	0.2
19.5	53.1	0.3	110.0	9.0	0.2
20.5	25.5	0.4	110.0	9.0	0.2
21.5	7.3	0.2	120.0	NoLiq	0.2
22.5	5.4	0.2	120.0	NoLiq	0.2
23.5	5.0	0.1	120.0	NoLiq	0.2
24.5	5.7	0.2	120.0	NoLiq	0.2
25.5	6.8	0.2	120.0	NoLiq	0.2
26.5	34.8	0.3	110.0	25.0	0.1
27.5	18.4	0.3	110.0	25.0	0.1
28.5	47.5	0.4	110.0	25.0	0.1
29.5	43.8	0.3	110.0	25.0	0.1
30.5	13.9	0.2	110.0	25.0	0.1
31.5	9.0	0.2	120.0	NoLiq	0.1
32.5	9.0	0.2	120.0	NoLiq	0.1
33.5	12.3	0.3	120.0	NoLiq	0.1
34.5	69.4	0.4	120.0	NoLiq	0.1
35.5	16.1	0.4	120.0	NoLiq	0.1
36.5	39.8	1.5	120.0	NoLiq	0.1
37.5	256.5	1.5	120.0	10.0	1.1
38.5	216.4	1.5	120.0	10.0	1.1
39.5	180.2	1.0	120.0	10.0	1.1
40.5	201.4	0.8	120.0	10.0	1.1
41.5	178.5	0.8	120.0	10.0	1.1
42.5	235.7	0.9	120.0	10.0	1.1
43.5	394.0	1.8	120.0	10.0	1.1
44.5	426.7	2.2	120.0	10.0	1.1
45.5	372.9	2.5	120.0	10.0	1.1
46.5	423.0	3.1	120.0	10.0	1.1
47.5	256.1	2.0	120.0	10.0	1.1
48.5	411.9	2.1	120.0	10.0	1.1
49.5	386.4	1.5	120.0	10.0	1.1
50.5	365.8	1.1	120.0	10.0	1.1
51.5	338.1	0.9	120.0	10.0	1.1
52.5	263.7	0.8	120.0	10.0	1.1
53.5	177.3	1.3	120.0	10.0	1.1
54.5	239.8	2.0	120.0	10.0	1.1
55.5	244.1	1.3	120.0	10.0	1.1
56.5	281.9	1.8	120.0	10.0	1.1
57.5	285.7	2.1	120.0	10.0	1.1
58.5	289.2	2.1	120.0	10.0	1.1
59.5	293.7	2.9	120.0	10.0	1.1
60.5	373.5	3.2	120.0	10.0	1.1
61.5	374.5	2.9	120.0	10.0	1.1
62.5	381.9	4.2	120.0	10.0	1.1
63.5	335.1	3.4	120.0	10.0	1.1
64.5	320.2	3.0	120.0	10.0	1.1
65.5	328.9	2.3	120.0	16.0	0.5
66.5	204.8	2.0	120.0	16.0	0.5
67.5	224.2	2.7	120.0	16.0	0.5
68.5	184.0	2.8	120.0	16.0	0.5
69.5	190.1	2.0	120.0	16.0	0.5
70.5	129.9	2.6	120.0	16.0	0.1
71.5	201.2	2.2	120.0	16.0	0.1
72.5	188.9	2.2	120.0	16.0	0.1
73.5	249.9	3.6	120.0	16.0	0.1
74.5	275.0	2.1	120.0	16.0	0.1
75.5	170.1	0.0	120.0	16.0	0.1

Output Results:

Settlement of saturated sands=4.07 in.
Settlement of dry sands=0.00 in.
Total settlement of saturated and dry sands=4.07 in.
Differential Settlement=2.035 to 2.687 in.

Depth	CRRm	CSRfs	F.S.	S_sat.	S_dry	S_all
ft				in.	in.	in.
0.00	2.00	0.32	5.00	4.07	0.00	4.07
0.05	2.00	0.86	5.00	4.07	0.00	4.07
0.10	2.00	0.86	5.00	4.07	0.00	4.07
0.15	2.00	0.86	5.00	4.07	0.00	4.07
0.20	2.00	0.86	5.00	4.07	0.00	4.07
0.25	2.00	0.86	5.00	4.07	0.00	4.07
0.30	2.00	0.86	5.00	4.07	0.00	4.07
0.35	2.00	0.86	5.00	4.07	0.00	4.07
0.40	2.00	0.86	5.00	4.07	0.00	4.07
0.45	2.00	0.86	5.00	4.07	0.00	4.07
0.50	2.00	0.86	5.00	4.07	0.00	4.07
0.55	2.00	0.86	5.00	4.07	0.00	4.07
0.60	2.00	0.86	5.00	4.07	0.00	4.07
0.65	2.00	0.86	5.00	4.07	0.00	4.07
0.70	2.00	0.86	5.00	4.07	0.00	4.07
0.75	2.00	0.86	5.00	4.07	0.00	4.07
0.80	2.00	0.86	5.00	4.07	0.00	4.07
0.85	2.00	0.86	5.00	4.07	0.00	4.07
0.90	2.00	0.86	5.00	4.07	0.00	4.07
0.95	2.00	0.86	5.00	4.07	0.00	4.07
1.00	2.00	0.86	5.00	4.07	0.00	4.07
1.05	2.00	0.86	5.00	4.07	0.00	4.07
1.10	2.00	0.86	5.00	4.07	0.00	4.07
1.15	2.00	0.86	5.00	4.07	0.00	4.07
1.20	2.00	0.86	5.00	4.07	0.00	4.07
1.25	2.00	0.86	5.00	4.07	0.00	4.07
1.30	2.00	0.86	5.00	4.07	0.00	4.07
1.35	2.00	0.86	5.00	4.07	0.00	4.07
1.40	2.00	0.86	5.00	4.07	0.00	4.07
1.45	2.00	0.86	5.00	4.07	0.00	4.07
1.50	2.00	0.86	5.00	4.07	0.00	4.07
1.55	2.00	0.86	5.00	4.07	0.00	4.07
1.60	2.00	0.86	5.00	4.07	0.00	4.07
1.65	2.00	0.86	5.00	4.07	0.00	4.07
1.70	2.00	0.86	5.00	4.07	0.00	4.07
1.75	2.00	0.86	5.00	4.07	0.00	4.07
1.80	2.00	0.86	5.00	4.07	0.00	4.07
1.85	2.00	0.86	5.00	4.07	0.00	4.07
1.90	2.00	0.86	5.00	4.07	0.00	4.07
1.95	2.00	0.86	5.00	4.07	0.00	4.07
2.00	2.00	0.86	5.00	4.07	0.00	4.07
2.05	2.00	0.86	5.00	4.07	0.00	4.07
2.10	2.00	0.86	5.00	4.07	0.00	4.07
2.15	2.00	0.86	5.00	4.07	0.00	4.07
2.20	2.00	0.86	5.00	4.07	0.00	4.07
2.25	2.00	0.86	5.00	4.07	0.00	4.07
2.30	2.00	0.86	5.00	4.07	0.00	4.07
2.35	2.00	0.86	5.00	4.07	0.00	4.07
2.40	2.00	0.86	5.00	4.07	0.00	4.07
2.45	2.00	0.86	5.00	4.07	0.00	4.07
2.50	2.00	0.86	5.00	4.07	0.00	4.07
2.55	2.00	0.86	5.00	4.07	0.00	4.07
2.60	2.00	0.86	5.00	4.07	0.00	4.07
2.65	2.00	0.86	5.00	4.07	0.00	4.07
2.70	2.00	0.86	5.00	4.07	0.00	4.07
2.75	2.00	0.86	5.00	4.07	0.00	4.07
2.80	2.00	0.86	5.00	4.07	0.00	4.07
2.85	2.00	0.86	5.00	4.07	0.00	4.07
2.90	2.00	0.86	5.00	4.07	0.00	4.07
2.95	2.00	0.86	5.00	4.07	0.00	4.07
3.00	2.00	0.86	5.00	4.07	0.00	4.07
3.05	2.00	0.86	5.00	4.07	0.00	4.07
3.10	2.00	0.86	5.00	4.07	0.00	4.07
3.15	2.00	0.86	5.00	4.07	0.00	4.07
3.20	2.00	0.86	5.00	4.07	0.00	4.07
3.25	2.00	0.86	5.00	4.07	0.00	4.07
3.30	2.00	0.86	5.00	4.07	0.00	4.07
3.35	2.00	0.86	5.00	4.07	0.00	4.07
3.40	2.00	0.86	5.00	4.07	0.00	4.07
3.45	2.00	0.86	5.00	4.07	0.00	4.07
3.50	2.00	0.86	5.00	4.07	0.00	4.07
3.55	2.00	0.86	5.00	4.07	0.00	4.07
3.60	2.00	0.86	5.00	4.07	0.00	4.07
3.65	2.00	0.86	5.00	4.07	0.00	4.07
3.70	2.00	0.86	5.00	4.07	0.00	4.07
3.75	2.00	0.85	5.00	4.07	0.00	4.07
3.80	2.00	0.85	5.00	4.07	0.00	4.07
3.85	2.00	0.85	5.00	4.07	0.00	4.07
3.90	2.00	0.85	5.00	4.07	0.00	4.07
3.95	2.00	0.85	5.00	4.07	0.00	4.07
4.00	2.00	0.85	5.00	4.07	0.00	4.07
4.05	2.00	0.85	5.00	4.07	0.00	4.07
4.10	2.00	0.84	5.00	4.07	0.00	4.07
4.15	2.00	0.84	5.00	4.07	0.00	4.07
4.20	2.00	0.84	5.00	4.07	0.00	4.07
4.25	2.00	0.84	5.00	4.07	0.00	4.07
4.30	2.00	0.84	5.00	4.07	0.00	4.07
4.35	2.00	0.83	5.00	4.07	0.00	4.07
4.40	2.00	0.83	5.00	4.07	0.00	4.07
4.45	2.00	0.83	5.00	4.07	0.00	4.07
4.50	2.00	0.83	5.00	4.07	0.00	4.07
4.55	2.00	0.82	5.00	4.07	0.00	4.07
4.60	2.00	0.82	5.00	4.07	0.00	4.07
4.65	2.00	0.82	5.00	4.07	0.00	4.07
4.70	2.00	0.82	5.00	4.07	0.00	4.07
4.75	2.00	0.81	5.00	4.07	0.00	4.07
4.80	2.00	0.81	5.00	4.07	0.00	4.07
4.85	2.00	0.81	5.00	4.07	0.00	4.07
4.90	2.00	0.81	5.00	4.07	0.00	4.07
4.95	2.00	0.81	5.00	4.07	0.00	4.07
5.00	2.00	0.80	5.00	4.07	0.00	4.07
5.05	2.00	0.80	5.00	4.07	0.00	4.07
5.10	2.00	0.80	5.00	4.07	0.00	4.07
5.15	2.00	0.80	5.00	4.07	0.00	4.07
5.20	2.00	0.80	5.00	4.07	0.00	4.07
5.25	2.00	0.79	5.00	4.07	0.00	4.07
5.30	2.00	0.79	5.00	4.07	0.00	4.07
5.35	2.00	0.79	5.00	4.07	0.00	4.07
5.40	2.00	0.79	5.00	4.07	0.00	4.07
5.45	2.00	0.79	5.00	4.07	0.00	4.07
5.50	2.00	0.79	5.00	4.07	0.00	4.07
5.55	2.00	0.79	5.00	4.07	0.00	4.07
5.60	2.00	0.78	5.00	4.07	0.00	4.07
5.65	2.00	0.78	5.00	4.07	0.00	4.07
5.70	2.00	0.78	5.00	4.07	0.00	4.07
5.75	2.00	0.78	5.00	4.07	0.00	4.07
5.80	2.00	0.78	5.00	4.07	0.00	4.07
5.85	2.00	0.78	5.00	4.07	0.00	4.07
5.90	2.00	0.78	5.00	4.07	0.00	4.07
5.95	2.00	0.77	5.00	4.07	0.00	4.07
6.00	2.00	0.77	5.00	4.07	0.00	4.07
6.05	2.00	0.77	5.00	4.07	0.00	4.07
6.10	2.00	0.77	5.00	4.07	0.00	4.07
6.15	2.00	0.77	5.00	4.07	0.00	4.07
6.20	2.00	0.77	5.00	4.07	0.00	4.07
6.25	2.00	0.77	5.00	4.07	0.00	4.07
6.30	2.00	0.77	5.00	4.07	0.00	4.07
6.35	2.00	0.76	5.00	4.07	0.00	4.07
6.40	2.00	0.76	5.00	4.07	0.00	4.07
6.45	2.00	0.76	5.00	4.07	0.00	4.07
6.50	2.00	0.76	5.00	4.07	0.00	4.07
6.55	2.00	0.76	5.00	4.07	0.00	4.07

6.60	2.00	0.76	5.00	4.07	0.00	4.07
6.65	2.00	0.76	5.00	4.07	0.00	4.07
6.70	2.00	0.76	5.00	4.07	0.00	4.07
6.75	2.00	0.76	5.00	4.07	0.00	4.07
6.80	2.00	0.76	5.00	4.07	0.00	4.07
6.85	2.00	0.76	5.00	4.07	0.00	4.07
6.90	2.00	0.75	5.00	4.07	0.00	4.07
6.95	2.00	0.75	5.00	4.07	0.00	4.07
7.00	2.00	0.75	5.00	4.07	0.00	4.07
7.05	2.00	0.75	5.00	4.07	0.00	4.07
7.10	2.00	0.75	5.00	4.07	0.00	4.07
7.15	2.00	0.75	5.00	4.07	0.00	4.07
7.20	2.00	0.75	5.00	4.07	0.00	4.07
7.25	2.00	0.75	5.00	4.07	0.00	4.07
7.30	2.00	0.75	5.00	4.07	0.00	4.07
7.35	2.00	0.75	5.00	4.07	0.00	4.07
7.40	2.00	0.75	5.00	4.07	0.00	4.07
7.45	2.00	0.75	5.00	4.07	0.00	4.07
7.50	2.00	0.74	5.00	4.07	0.00	4.07
7.55	2.00	0.74	5.00	4.07	0.00	4.07
7.60	2.00	0.74	5.00	4.07	0.00	4.07
7.65	2.00	0.74	5.00	4.07	0.00	4.07
7.70	2.00	0.74	5.00	4.07	0.00	4.07
7.75	2.00	0.74	5.00	4.07	0.00	4.07
7.80	2.00	0.74	5.00	4.07	0.00	4.07
7.85	2.00	0.74	5.00	4.07	0.00	4.07
7.90	2.00	0.74	5.00	4.07	0.00	4.07
7.95	2.00	0.74	5.00	4.07	0.00	4.07
8.00	2.00	0.74	5.00	4.07	0.00	4.07
8.05	2.00	0.74	5.00	4.07	0.00	4.07
8.10	2.00	0.74	5.00	4.07	0.00	4.07
8.15	2.00	0.74	5.00	4.07	0.00	4.07
8.20	2.00	0.74	5.00	4.07	0.00	4.07
8.25	2.00	0.74	5.00	4.07	0.00	4.07
8.30	2.00	0.74	5.00	4.07	0.00	4.07
8.35	2.00	0.74	5.00	4.07	0.00	4.07
8.40	2.00	0.74	5.00	4.07	0.00	4.07
8.45	2.00	0.74	5.00	4.07	0.00	4.07
8.50	0.11	0.74	0.15*	4.07	0.00	4.07
8.55	0.12	0.74	0.16*	4.05	0.00	4.05
8.60	0.12	0.74	0.16*	4.03	0.00	4.03
8.65	0.12	0.74	0.17*	4.02	0.00	4.02
8.70	0.13	0.74	0.17*	4.00	0.00	4.00
8.75	0.13	0.74	0.18*	3.98	0.00	3.98
8.80	0.14	0.74	0.19*	3.97	0.00	3.97
8.85	0.14	0.74	0.19*	3.95	0.00	3.95
8.90	0.15	0.74	0.20*	3.93	0.00	3.93
8.95	0.15	0.74	0.21*	3.92	0.00	3.92
9.00	0.16	0.74	0.22*	3.90	0.00	3.90
9.05	0.17	0.74	0.23*	3.89	0.00	3.89
9.10	0.17	0.74	0.24*	3.87	0.00	3.87
9.15	0.18	0.74	0.25*	3.86	0.00	3.86
9.20	0.19	0.74	0.26*	3.84	0.00	3.84
9.25	0.20	0.74	0.27*	3.83	0.00	3.83
9.30	0.21	0.73	0.28*	3.82	0.00	3.82
9.35	0.22	0.73	0.29*	3.80	0.00	3.80
9.40	0.22	0.73	0.31*	3.79	0.00	3.79
9.45	0.24	0.73	0.32*	3.78	0.00	3.78
9.50	0.25	0.73	0.33*	3.76	0.00	3.76
9.55	0.25	0.73	0.34*	3.75	0.00	3.75
9.60	0.25	0.73	0.34*	3.74	0.00	3.74
9.65	0.25	0.73	0.34*	3.73	0.00	3.73
9.70	0.25	0.73	0.34*	3.71	0.00	3.71
9.75	0.25	0.73	0.34*	3.70	0.00	3.70
9.80	0.25	0.73	0.34*	3.69	0.00	3.69
9.85	0.25	0.73	0.34*	3.68	0.00	3.68
9.90	0.25	0.73	0.34*	3.66	0.00	3.66
9.95	0.25	0.73	0.34*	3.65	0.00	3.65
10.00	0.25	0.73	0.34*	3.64	0.00	3.64
10.05	0.25	0.73	0.34*	3.63	0.00	3.63
10.10	0.25	0.73	0.34*	3.61	0.00	3.61
10.15	0.25	0.73	0.34*	3.60	0.00	3.60
10.20	0.25	0.73	0.35*	3.59	0.00	3.59
10.25	0.25	0.73	0.35*	3.58	0.00	3.58
10.30	0.25	0.73	0.35*	3.57	0.00	3.57
10.35	0.25	0.73	0.35*	3.55	0.00	3.55
10.40	0.26	0.73	0.35*	3.54	0.00	3.54
10.45	0.26	0.73	0.35*	3.53	0.00	3.53
10.50	0.26	0.73	0.35*	3.52	0.00	3.52
10.55	0.25	0.73	0.34*	3.50	0.00	3.50
10.60	0.24	0.73	0.33*	3.49	0.00	3.49
10.65	0.23	0.73	0.31*	3.48	0.00	3.48
10.70	0.22	0.73	0.30*	3.47	0.00	3.47
10.75	0.21	0.73	0.29*	3.45	0.00	3.45
10.80	0.21	0.73	0.28*	3.44	0.00	3.44
10.85	0.20	0.73	0.27*	3.43	0.00	3.43
10.90	0.19	0.73	0.26*	3.42	0.00	3.42
10.95	0.19	0.73	0.25*	3.40	0.00	3.40
11.00	0.18	0.73	0.25*	3.39	0.00	3.39
11.05	0.17	0.73	0.24*	3.38	0.00	3.38
11.10	0.17	0.73	0.23*	3.36	0.00	3.36
11.15	0.16	0.73	0.22*	3.35	0.00	3.35
11.20	0.16	0.73	0.22*	3.33	0.00	3.33
11.25	0.16	0.73	0.21*	3.32	0.00	3.32
11.30	0.15	0.73	0.21*	3.30	0.00	3.30
11.35	0.15	0.73	0.20*	3.29	0.00	3.29
11.40	0.14	0.73	0.20*	3.27	0.00	3.27
11.45	0.14	0.73	0.19*	3.26	0.00	3.26
11.50	0.14	0.73	0.19*	3.24	0.00	3.24
11.55	0.14	0.73	0.19*	3.23	0.00	3.23
11.60	0.13	0.73	0.18*	3.21	0.00	3.21
11.65	0.13	0.73	0.18*	3.20	0.00	3.20
11.70	0.13	0.73	0.18*	3.18	0.00	3.18
11.75	0.13	0.73	0.18*	3.16	0.00	3.16
11.80	0.13	0.73	0.18*	3.15	0.00	3.15
11.85	0.13	0.73	0.17*	3.13	0.00	3.13
11.90	0.13	0.73	0.17*	3.12	0.00	3.12
11.95	0.13	0.73	0.17*	3.10	0.00	3.10
12.00	0.12	0.73	0.17*	3.09	0.00	3.09
12.05	0.12	0.73	0.17*	3.07	0.00	3.07
12.10	0.12	0.73	0.17*	3.05	0.00	3.05
12.15	0.12	0.73	0.17*	3.04	0.00	3.04
12.20	0.13	0.73	0.17*	3.02	0.00	3.02
12.25	0.13	0.73	0.17*	3.01	0.00	3.01
12.30	0.13	0.73	0.18*	2.99	0.00	2.99
12.35	0.13	0.73	0.18*	2.98	0.00	2.98
12.40	0.14	0.73	0.19*	2.96	0.00	2.96
12.45	0.16	0.73	0.21*	2.95	0.00	2.95
12.50	0.18	0.73	0.25*	2.94	0.00	2.94
12.55	0.14	0.73	0.20*	2.93	0.00	2.93
12.60	0.13	0.73	0.18*	2.92	0.00	2.92
12.65	0.12	0.73	0.17*	2.90	0.00	2.90
12.70	0.12	0.73	0.17*	2.89	0.00	2.89
12.75	0.12	0.73	0.17*	2.87	0.00	2.87
12.80	0.12	0.73	0.16*	2.85	0.00	2.85
12.85	0.12	0.73	0.16*	2.84	0.00	2.84
12.90	0.12	0.73	0.17*	2.82	0.00	2.82
12.95	0.12	0.73	0.17*	2.80	0.00	2.80
13.00	0.12	0.73	0.17*	2.79	0.00	2.79
13.05	0.12	0.73	0.17*	2.77	0.00	2.77
13.10	0.13	0.73	0.17*	2.75	0.00	2.75
13.15	0.13	0.73	0.18*	2.74	0.00	2.74
13.20	0.13	0.73	0.18*	2.72	0.00	2.72
13.25	0.13	0.73	0.18*	2.71	0.00	2.71
13.30	0.13	0.73	0.19*	2.69	0.00	2.69
13.35	0.14	0.73	0.19*	2.67	0.00	2.67
13.40	0.14	0.73	0.19*	2.66	0.00	2.66
13.45	0.14	0.73	0.20*	2.64	0.00	2.64

13.50	0.15	0.73	0.20*	2.63	0.00	2.63
13.55	0.15	0.73	0.21*	2.61	0.00	2.61
13.60	0.16	0.73	0.22*	2.60	0.00	2.60
13.65	0.17	0.73	0.23*	2.58	0.00	2.58
13.70	0.17	0.73	0.24*	2.57	0.00	2.57
13.75	0.18	0.73	0.25*	2.55	0.00	2.55
13.80	0.19	0.73	0.26*	2.54	0.00	2.54
13.85	0.20	0.73	0.27*	2.52	0.00	2.52
13.90	0.21	0.73	0.29*	2.51	0.00	2.51
13.95	0.22	0.73	0.30*	2.50	0.00	2.50
14.00	0.23	0.73	0.31*	2.48	0.00	2.48
14.05	0.24	0.73	0.33*	2.47	0.00	2.47
14.10	0.25	0.73	0.34*	2.46	0.00	2.46
14.15	0.26	0.73	0.36*	2.45	0.00	2.45
14.20	0.27	0.73	0.38*	2.44	0.00	2.44
14.25	0.29	0.73	0.40*	2.42	0.00	2.42
14.30	0.30	0.73	0.42*	2.41	0.00	2.41
14.35	0.32	0.73	0.44*	2.40	0.00	2.40
14.40	0.33	0.73	0.46*	2.39	0.00	2.39
14.45	0.35	0.73	0.48*	2.38	0.00	2.38
14.50	0.36	0.73	0.50*	2.37	0.00	2.37
14.55	0.39	0.73	0.54*	2.36	0.00	2.36
14.60	0.43	0.73	0.59*	2.35	0.00	2.35
14.65	0.46	0.73	0.64*	2.34	0.00	2.34
14.70	0.51	0.73	0.70*	2.33	0.00	2.33
14.75	0.55	0.73	0.76*	2.32	0.00	2.32
14.80	0.60	0.73	0.83*	2.32	0.00	2.32
14.85	0.66	0.73	0.91*	2.32	0.00	2.32
14.90	0.72	0.73	0.99*	2.31	0.00	2.31
14.95	0.78	0.72	1.07	2.31	0.00	2.31
15.00	0.84	0.72	1.16	2.31	0.00	2.31
15.05	0.91	0.72	1.26	2.31	0.00	2.31
15.10	0.98	0.72	1.36	2.31	0.00	2.31
15.15	1.06	0.72	1.47	2.31	0.00	2.31
15.20	1.14	0.72	1.58	2.31	0.00	2.31
15.25	1.23	0.72	1.70	2.31	0.00	2.31
15.30	1.32	0.72	1.82	2.31	0.00	2.31
15.35	1.41	0.72	1.95	2.31	0.00	2.31
15.40	1.51	0.72	2.09	2.31	0.00	2.31
15.45	1.61	0.72	2.23	2.31	0.00	2.31
15.50	1.72	0.72	2.38	2.31	0.00	2.31
15.55	1.76	0.72	2.43	2.31	0.00	2.31
15.60	1.80	0.72	2.48	2.31	0.00	2.31
15.65	1.83	0.72	2.53	2.31	0.00	2.31
15.70	1.87	0.72	2.58	2.31	0.00	2.31
15.75	1.91	0.72	2.64	2.31	0.00	2.31
15.80	1.95	0.72	2.69	2.31	0.00	2.31
15.85	1.99	0.72	2.75	2.31	0.00	2.31
15.90	2.03	0.72	2.80	2.31	0.00	2.31
15.95	2.07	0.72	2.86	2.31	0.00	2.31
16.00	2.11	0.72	2.91	2.31	0.00	2.31
16.05	2.15	0.72	2.97	2.31	0.00	2.31
16.10	2.19	0.72	3.03	2.31	0.00	2.31
16.15	2.23	0.72	3.09	2.31	0.00	2.31
16.20	2.27	0.72	3.14	2.31	0.00	2.31
16.25	2.32	0.72	3.20	2.31	0.00	2.31
16.30	2.36	0.72	3.26	2.31	0.00	2.31
16.35	2.39	0.72	3.31	2.31	0.00	2.31
16.40	2.39	0.72	3.31	2.31	0.00	2.31
16.45	2.39	0.72	3.31	2.31	0.00	2.31
16.50	2.39	0.72	3.31	2.31	0.00	2.31
16.55	2.39	0.72	3.31	2.31	0.00	2.31
16.60	2.39	0.72	3.31	2.31	0.00	2.31
16.65	2.39	0.72	3.31	2.31	0.00	2.31
16.70	2.39	0.72	3.31	2.31	0.00	2.31
16.75	2.39	0.72	3.31	2.31	0.00	2.31
16.80	2.39	0.72	3.31	2.31	0.00	2.31
16.85	2.39	0.72	3.32	2.31	0.00	2.31
16.90	2.39	0.72	3.32	2.31	0.00	2.31
16.95	2.39	0.72	3.32	2.31	0.00	2.31
17.00	2.39	0.72	3.32	2.31	0.00	2.31
17.05	2.39	0.72	3.31	2.31	0.00	2.31
17.10	2.37	0.72	3.29	2.31	0.00	2.31
17.15	2.36	0.72	3.27	2.31	0.00	2.31
17.20	2.35	0.72	3.25	2.31	0.00	2.31
17.25	2.33	0.72	3.24	2.31	0.00	2.31
17.30	2.32	0.72	3.22	2.31	0.00	2.31
17.35	2.31	0.72	3.20	2.31	0.00	2.31
17.40	2.30	0.72	3.19	2.31	0.00	2.31
17.45	2.28	0.72	3.17	2.31	0.00	2.31
17.50	2.27	0.72	3.15	2.31	0.00	2.31
17.55	2.17	0.72	3.02	2.31	0.00	2.31
17.60	2.08	0.72	2.89	2.31	0.00	2.31
17.65	1.99	0.72	2.76	2.31	0.00	2.31
17.70	1.90	0.72	2.64	2.31	0.00	2.31
17.75	1.82	0.72	2.53	2.31	0.00	2.31
17.80	1.74	0.72	2.42	2.31	0.00	2.31
17.85	1.66	0.72	2.31	2.31	0.00	2.31
17.90	1.58	0.72	2.20	2.31	0.00	2.31
17.95	1.51	0.72	2.10	2.31	0.00	2.31
18.00	1.44	0.72	2.00	2.31	0.00	2.31
18.05	1.37	0.72	1.91	2.31	0.00	2.31
18.10	1.31	0.72	1.82	2.31	0.00	2.31
18.15	1.24	0.72	1.73	2.31	0.00	2.31
18.20	1.18	0.72	1.64	2.31	0.00	2.31
18.25	1.12	0.72	1.56	2.31	0.00	2.31
18.30	1.07	0.72	1.48	2.31	0.00	2.31
18.35	1.01	0.72	1.41	2.31	0.00	2.31
18.40	0.96	0.72	1.34	2.31	0.00	2.31
18.45	0.91	0.72	1.27	2.31	0.00	2.31
18.50	0.86	0.72	1.20	2.31	0.00	2.31
18.55	0.79	0.72	1.10	2.31	0.00	2.31
18.60	0.72	0.72	1.00	2.31	0.00	2.31
18.65	0.66	0.72	0.91*	2.31	0.00	2.31
18.70	0.60	0.72	0.84*	2.31	0.00	2.31
18.75	0.55	0.72	0.77*	2.30	0.00	2.30
18.80	0.51	0.72	0.71*	2.30	0.00	2.30
18.85	0.47	0.72	0.65*	2.29	0.00	2.29
18.90	0.43	0.72	0.60*	2.29	0.00	2.29
18.95	0.39	0.72	0.55*	2.28	0.00	2.28
19.00	0.36	0.72	0.50*	2.27	0.00	2.27
19.05	0.33	0.72	0.46*	2.26	0.00	2.26
19.10	0.30	0.72	0.42*	2.25	0.00	2.25
19.15	0.27	0.72	0.38*	2.24	0.00	2.24
19.20	0.25	0.72	0.35*	2.22	0.00	2.22
19.25	0.23	0.72	0.32*	2.21	0.00	2.21
19.30	0.21	0.72	0.29*	2.20	0.00	2.20
19.35	0.19	0.72	0.27*	2.19	0.00	2.19
19.40	0.18	0.72	0.24*	2.17	0.00	2.17
19.45	0.16	0.72	0.22*	2.16	0.00	2.16
19.50	0.15	0.72	0.21*	2.14	0.00	2.14
19.55	0.15	0.72	0.20*	2.13	0.00	2.13
19.60	0.14	0.72	0.20*	2.11	0.00	2.11
19.65	0.14	0.72	0.20*	2.10	0.00	2.10
19.70	0.14	0.72	0.20*	2.08	0.00	2.08
19.75	0.14	0.72	0.19*	2.07	0.00	2.07
19.80	0.14	0.72	0.19*	2.05	0.00	2.05
19.85	0.14	0.72	0.19*	2.04	0.00	2.04
19.90	0.14	0.72	0.19*	2.02	0.00	2.02
19.95	0.13	0.72	0.19*	2.00	0.00	2.00
20.00	0.13	0.72	0.19*	1.99	0.00	1.99
20.05	0.13	0.72	0.19*	1.97	0.00	1.97
20.10	0.13	0.72	0.18*	1.96	0.00	1.96
20.15	0.13	0.72	0.18*	1.94	0.00	1.94
20.20	0.13	0.72	0.18*	1.93	0.00	1.93
20.25	0.13	0.72	0.18*	1.91	0.00	1.91
20.30	0.13	0.72	0.19*	1.90	0.00	1.90
20.35	0.13	0.72	0.19*	1.88	0.00	1.88

20.40	0.14	0.72	0.19*	1.87	0.00	1.87
20.45	0.14	0.72	0.20*	1.85	0.00	1.85
20.50	0.15	0.72	0.20*	1.84	0.00	1.84
20.55	0.15	0.72	0.21*	1.83	0.00	1.83
20.60	0.15	0.72	0.21*	1.81	0.00	1.81
20.65	0.15	0.71	0.22*	1.80	0.00	1.80
20.70	0.16	0.71	0.22*	1.79	0.00	1.79
20.75	0.17	0.71	0.23*	1.78	0.00	1.78
20.80	0.18	0.71	0.25*	1.76	0.00	1.76
20.85	0.19	0.71	0.27*	1.75	0.00	1.75
20.90	0.22	0.71	0.31*	1.74	0.00	1.74
20.95	0.22	0.71	0.31*	1.73	0.00	1.73
21.00	0.24	0.71	0.33*	1.73	0.00	1.73
21.05	2.00	0.71	5.00	1.72	0.00	1.72
21.10	2.00	0.71	5.00	1.72	0.00	1.72
21.15	2.00	0.71	5.00	1.72	0.00	1.72
21.20	2.00	0.71	5.00	1.72	0.00	1.72
21.25	2.00	0.71	5.00	1.72	0.00	1.72
21.30	2.00	0.71	5.00	1.72	0.00	1.72
21.35	2.00	0.71	5.00	1.72	0.00	1.72
21.40	2.00	0.71	5.00	1.72	0.00	1.72
21.45	2.00	0.71	5.00	1.72	0.00	1.72
21.50	2.00	0.71	5.00	1.72	0.00	1.72
21.55	2.00	0.71	5.00	1.72	0.00	1.72
21.60	2.00	0.71	5.00	1.72	0.00	1.72
21.65	2.00	0.71	5.00	1.72	0.00	1.72
21.70	2.00	0.71	5.00	1.72	0.00	1.72
21.75	2.00	0.71	5.00	1.72	0.00	1.72
21.80	2.00	0.71	5.00	1.72	0.00	1.72
21.85	2.00	0.71	5.00	1.72	0.00	1.72
21.90	2.00	0.71	5.00	1.72	0.00	1.72
21.95	2.00	0.71	5.00	1.72	0.00	1.72
22.00	2.00	0.71	5.00	1.72	0.00	1.72
22.05	2.00	0.71	5.00	1.72	0.00	1.72
22.10	2.00	0.71	5.00	1.72	0.00	1.72
22.15	2.00	0.71	5.00	1.72	0.00	1.72
22.20	2.00	0.71	5.00	1.72	0.00	1.72
22.25	2.00	0.71	5.00	1.72	0.00	1.72
22.30	2.00	0.71	5.00	1.72	0.00	1.72
22.35	2.00	0.71	5.00	1.72	0.00	1.72
22.40	2.00	0.71	5.00	1.72	0.00	1.72
22.45	2.00	0.71	5.00	1.72	0.00	1.72
22.50	2.00	0.71	5.00	1.72	0.00	1.72
22.55	2.00	0.71	5.00	1.72	0.00	1.72
22.60	2.00	0.71	5.00	1.72	0.00	1.72
22.65	2.00	0.71	5.00	1.72	0.00	1.72
22.70	2.00	0.71	5.00	1.72	0.00	1.72
22.75	2.00	0.70	5.00	1.72	0.00	1.72
22.80	2.00	0.70	5.00	1.72	0.00	1.72
22.85	2.00	0.70	5.00	1.72	0.00	1.72
22.90	2.00	0.70	5.00	1.72	0.00	1.72
22.95	2.00	0.70	5.00	1.72	0.00	1.72
23.00	2.00	0.70	5.00	1.72	0.00	1.72
23.05	2.00	0.70	5.00	1.72	0.00	1.72
23.10	2.00	0.70	5.00	1.72	0.00	1.72
23.15	2.00	0.70	5.00	1.72	0.00	1.72
23.20	2.00	0.70	5.00	1.72	0.00	1.72
23.25	2.00	0.70	5.00	1.72	0.00	1.72
23.30	2.00	0.70	5.00	1.72	0.00	1.72
23.35	2.00	0.70	5.00	1.72	0.00	1.72
23.40	2.00	0.70	5.00	1.72	0.00	1.72
23.45	2.00	0.70	5.00	1.72	0.00	1.72
23.50	2.00	0.70	5.00	1.72	0.00	1.72
23.55	2.00	0.70	5.00	1.72	0.00	1.72
23.60	2.00	0.70	5.00	1.72	0.00	1.72
23.65	2.00	0.70	5.00	1.72	0.00	1.72
23.70	2.00	0.70	5.00	1.72	0.00	1.72
23.75	2.00	0.70	5.00	1.72	0.00	1.72
23.80	2.00	0.70	5.00	1.72	0.00	1.72

23.85	2.00	0.70	5.00	1.72	0.00	1.72
23.90	2.00	0.70	5.00	1.72	0.00	1.72
23.95	2.00	0.70	5.00	1.72	0.00	1.72
24.00	2.00	0.70	5.00	1.72	0.00	1.72
24.05	2.00	0.70	5.00	1.72	0.00	1.72
24.10	2.00	0.70	5.00	1.72	0.00	1.72
24.15	2.00	0.70	5.00	1.72	0.00	1.72
24.20	2.00	0.70	5.00	1.72	0.00	1.72
24.25	2.00	0.70	5.00	1.72	0.00	1.72
24.30	2.00	0.70	5.00	1.72	0.00	1.72
24.35	2.00	0.70	5.00	1.72	0.00	1.72
24.40	2.00	0.70	5.00	1.72	0.00	1.72
24.45	2.00	0.70	5.00	1.72	0.00	1.72
24.50	2.00	0.70	5.00	1.72	0.00	1.72
24.55	2.00	0.70	5.00	1.72	0.00	1.72
24.60	2.00	0.70	5.00	1.72	0.00	1.72
24.65	2.00	0.70	5.00	1.72	0.00	1.72
24.70	2.00	0.70	5.00	1.72	0.00	1.72
24.75	2.00	0.70	5.00	1.72	0.00	1.72
24.80	2.00	0.70	5.00	1.72	0.00	1.72
24.85	2.00	0.70	5.00	1.72	0.00	1.72
24.90	2.00	0.69	5.00	1.72	0.00	1.72
24.95	2.00	0.69	5.00	1.72	0.00	1.72
25.00	2.00	0.69	5.00	1.72	0.00	1.72
25.05	2.00	0.69	5.00	1.72	0.00	1.72
25.10	2.00	0.69	5.00	1.72	0.00	1.72
25.15	2.00	0.69	5.00	1.72	0.00	1.72
25.20	2.00	0.69	5.00	1.72	0.00	1.72
25.25	2.00	0.69	5.00	1.72	0.00	1.72
25.30	2.00	0.69	5.00	1.72	0.00	1.72
25.35	2.00	0.69	5.00	1.72	0.00	1.72
25.40	2.00	0.69	5.00	1.72	0.00	1.72
25.45	2.00	0.69	5.00	1.72	0.00	1.72
25.50	2.00	0.69	5.00	1.72	0.00	1.72
25.55	2.00	0.69	5.00	1.72	0.00	1.72
25.60	2.00	0.69	5.00	1.72	0.00	1.72
25.65	2.00	0.69	5.00	1.72	0.00	1.72
25.70	2.00	0.69	5.00	1.72	0.00	1.72
25.75	2.00	0.69	5.00	1.72	0.00	1.72
25.80	2.00	0.69	5.00	1.72	0.00	1.72
25.85	2.00	0.69	5.00	1.72	0.00	1.72
25.90	2.00	0.69	5.00	1.72	0.00	1.72
25.95	2.00	0.69	5.00	1.72	0.00	1.72
26.00	2.00	0.69	5.00	1.72	0.00	1.72
26.05	2.00	0.69	5.00	1.72	0.00	1.72
26.10	2.00	0.69	5.00	1.72	0.00	1.72
26.15	2.00	0.69	5.00	1.72	0.00	1.72
26.20	2.00	0.69	5.00	1.72	0.00	1.72
26.25	2.00	0.69	5.00	1.72	0.00	1.72
26.30	2.00	0.69	5.00	1.72	0.00	1.72
26.35	2.00	0.69	5.00	1.72	0.00	1.72
26.40	2.00	0.69	5.00	1.72	0.00	1.72
26.45	2.00	0.69	5.00	1.72	0.00	1.72
26.50	2.00	0.69	5.00	1.72	0.00	1.72
26.55	0.12	0.69	0.17*	1.72	0.00	1.72
26.60	0.12	0.69	0.17*	1.70	0.00	1.70
26.65	0.12	0.69	0.17*	1.68	0.00	1.68
26.70	0.12	0.69	0.17*	1.67	0.00	1.67
26.75	0.12	0.69	0.17*	1.65	0.00	1.65
26.80	0.12	0.69	0.17*	1.63	0.00	1.63
26.85	0.12	0.69	0.17*	1.62	0.00	1.62
26.90	0.12	0.69	0.18*	1.60	0.00	1.60
26.95	0.12	0.69	0.18*	1.59	0.00	1.59
27.00	0.12	0.69	0.18*	1.57	0.00	1.57
27.05	0.13	0.69	0.18*	1.55	0.00	1.55
27.10	0.13	0.69	0.19*	1.54	0.00	1.54
27.15	0.13	0.69	0.19*	1.52	0.00	1.52
27.20	0.14	0.69	0.20*	1.51	0.00	1.51
27.25	0.14	0.69	0.21*	1.50	0.00	1.50

27.30	0.15	0.69	0.22*	1.48	0.00	1.48
27.35	0.17	0.69	0.25*	1.47	0.00	1.47
27.40	0.20	0.69	0.28*	1.46	0.00	1.46
27.45	0.22	0.69	0.32*	1.45	0.00	1.45
27.50	2.00	0.69	5.00	1.44	0.00	1.44
27.55	0.21	0.69	0.31*	1.44	0.00	1.44
27.60	0.17	0.69	0.25*	1.43	0.00	1.43
27.65	0.15	0.69	0.22*	1.42	0.00	1.42
27.70	0.14	0.69	0.20*	1.41	0.00	1.41
27.75	0.13	0.69	0.19*	1.39	0.00	1.39
27.80	0.13	0.69	0.19*	1.38	0.00	1.38
27.85	0.13	0.69	0.18*	1.37	0.00	1.37
27.90	0.12	0.69	0.18*	1.35	0.00	1.35
27.95	0.12	0.69	0.18*	1.34	0.00	1.34
28.00	0.12	0.69	0.18*	1.32	0.00	1.32
28.05	0.12	0.69	0.18*	1.30	0.00	1.30
28.10	0.12	0.69	0.18*	1.29	0.00	1.29
28.15	0.12	0.69	0.18*	1.27	0.00	1.27
28.20	0.13	0.69	0.18*	1.26	0.00	1.26
28.25	0.13	0.69	0.18*	1.24	0.00	1.24
28.30	0.13	0.69	0.18*	1.22	0.00	1.22
28.35	0.13	0.69	0.19*	1.21	0.00	1.21
28.40	0.13	0.69	0.19*	1.19	0.00	1.19
28.45	0.13	0.69	0.19*	1.17	0.00	1.17
28.50	0.13	0.69	0.19*	1.16	0.00	1.16
28.55	0.13	0.69	0.19*	1.14	0.00	1.14
28.60	0.13	0.69	0.19*	1.13	0.00	1.13
28.65	0.13	0.69	0.19*	1.11	0.00	1.11
28.70	0.13	0.69	0.19*	1.09	0.00	1.09
28.75	0.13	0.69	0.19*	1.08	0.00	1.08
28.80	0.13	0.69	0.19*	1.06	0.00	1.06
28.85	0.13	0.69	0.19*	1.05	0.00	1.05
28.90	0.13	0.69	0.19*	1.03	0.00	1.03
28.95	0.13	0.69	0.18*	1.01	0.00	1.01
29.00	0.13	0.69	0.18*	1.00	0.00	1.00
29.05	0.13	0.69	0.18*	0.98	0.00	0.98
29.10	0.13	0.69	0.18*	0.96	0.00	0.96
29.15	0.12	0.69	0.18*	0.95	0.00	0.95
29.20	0.12	0.69	0.18*	0.93	0.00	0.93
29.25	0.12	0.69	0.18*	0.91	0.00	0.91
29.30	0.12	0.69	0.18*	0.90	0.00	0.90
29.35	0.12	0.69	0.18*	0.88	0.00	0.88
29.40	0.12	0.69	0.18*	0.86	0.00	0.86
29.45	0.12	0.69	0.18*	0.85	0.00	0.85
29.50	0.12	0.69	0.18*	0.83	0.00	0.83
29.55	0.12	0.69	0.18*	0.81	0.00	0.81
29.60	0.12	0.69	0.17*	0.79	0.00	0.79
29.65	0.12	0.69	0.17*	0.78	0.00	0.78
29.70	0.12	0.69	0.17*	0.76	0.00	0.76
29.75	0.12	0.69	0.17*	0.74	0.00	0.74
29.80	0.12	0.69	0.17*	0.72	0.00	0.72
29.85	0.11	0.69	0.17*	0.71	0.00	0.71
29.90	0.11	0.69	0.17*	0.69	0.00	0.69
29.95	0.11	0.69	0.17*	0.67	0.00	0.67
30.00	0.11	0.69	0.17*	0.65	0.00	0.65
30.05	0.11	0.68	0.17*	0.64	0.00	0.64
30.10	0.11	0.68	0.17*	0.62	0.00	0.62
30.15	0.12	0.68	0.17*	0.60	0.00	0.60
30.20	0.12	0.68	0.17*	0.59	0.00	0.59
30.25	0.12	0.68	0.18*	0.57	0.00	0.57
30.30	0.13	0.68	0.19*	0.56	0.00	0.56
30.35	0.15	0.68	0.22*	0.54	0.00	0.54
30.40	2.00	0.68	5.00	0.53	0.00	0.53
30.45	2.00	0.68	5.00	0.53	0.00	0.53
30.50	2.00	0.68	5.00	0.53	0.00	0.53
30.55	2.00	0.68	5.00	0.53	0.00	0.53
30.60	2.00	0.68	5.00	0.53	0.00	0.53
30.65	2.00	0.68	5.00	0.53	0.00	0.53
30.70	2.00	0.68	5.00	0.53	0.00	0.53

30.75	2.00	0.68	5.00	0.53	0.00	0.53
30.80	2.00	0.68	5.00	0.53	0.00	0.53
30.85	2.00	0.68	5.00	0.53	0.00	0.53
30.90	2.00	0.68	5.00	0.53	0.00	0.53
30.95	2.00	0.68	5.00	0.53	0.00	0.53
31.00	2.00	0.68	5.00	0.53	0.00	0.53
31.05	2.00	0.68	5.00	0.53	0.00	0.53
31.10	2.00	0.68	5.00	0.53	0.00	0.53
31.15	2.00	0.68	5.00	0.53	0.00	0.53
31.20	2.00	0.68	5.00	0.53	0.00	0.53
31.25	2.00	0.68	5.00	0.53	0.00	0.53
31.30	2.00	0.68	5.00	0.53	0.00	0.53
31.35	2.00	0.68	5.00	0.53	0.00	0.53
31.40	2.00	0.68	5.00	0.53	0.00	0.53
31.45	2.00	0.68	5.00	0.53	0.00	0.53
31.50	2.00	0.68	5.00	0.53	0.00	0.53
31.55	2.00	0.68	5.00	0.53	0.00	0.53
31.60	2.00	0.67	5.00	0.53	0.00	0.53
31.65	2.00	0.67	5.00	0.53	0.00	0.53
31.70	2.00	0.67	5.00	0.53	0.00	0.53
31.75	2.00	0.67	5.00	0.53	0.00	0.53
31.80	2.00	0.67	5.00	0.53	0.00	0.53
31.85	2.00	0.67	5.00	0.53	0.00	0.53
31.90	2.00	0.67	5.00	0.53	0.00	0.53
31.95	2.00	0.67	5.00	0.53	0.00	0.53
32.00	2.00	0.67	5.00	0.53	0.00	0.53
32.05	2.00	0.67	5.00	0.53	0.00	0.53
32.10	2.00	0.67	5.00	0.53	0.00	0.53
32.15	2.00	0.67	5.00	0.53	0.00	0.53
32.20	2.00	0.67	5.00	0.53	0.00	0.53
32.25	2.00	0.67	5.00	0.53	0.00	0.53
32.30	2.00	0.67	5.00	0.53	0.00	0.53
32.35	2.00	0.67	5.00	0.53	0.00	0.53
32.40	2.00	0.67	5.00	0.53	0.00	0.53
32.45	2.00	0.67	5.00	0.53	0.00	0.53
32.50	2.00	0.67	5.00	0.53	0.00	0.53
32.55	2.00	0.67	5.00	0.53	0.00	0.53
32.60	2.00	0.67	5.00	0.53	0.00	0.53
32.65	2.00	0.67	5.00	0.53	0.00	0.53
32.70	2.00	0.67	5.00	0.53	0.00	0.53
32.75	2.00	0.67	5.00	0.53	0.00	0.53
32.80	2.00	0.67	5.00	0.53	0.00	0.53
32.85	2.00	0.66	5.00	0.53	0.00	0.53
32.90	2.00	0.66	5.00	0.53	0.00	0.53
32.95	2.00	0.66	5.00	0.53	0.00	0.53
33.00	2.00	0.66	5.00	0.53	0.00	0.53
33.05	2.00	0.66	5.00	0.53	0.00	0.53
33.10	2.00	0.66	5.00	0.53	0.00	0.53
33.15	2.00	0.66	5.00	0.53	0.00	0.53
33.20	2.00	0.66	5.00	0.53	0.00	0.53
33.25	2.00	0.66	5.00	0.53	0.00	0.53
33.30	2.00	0.66	5.00	0.53	0.00	0.53
33.35	2.00	0.66	5.00	0.53	0.00	0.53
33.40	2.00	0.66	5.00	0.53	0.00	0.53
33.45	2.00	0.66	5.00	0.53	0.00	0.53
33.50	2.00	0.66	5.00	0.53	0.00	0.53
33.55	2.00	0.66	5.00	0.53	0.00	0.53
33.60	2.00	0.66	5.00	0.53	0.00	0.53
33.65	2.00	0.66	5.00	0.53	0.00	0.53
33.70	2.00	0.66	5.00	0.53	0.00	0.53
33.75	2.00	0.66	5.00	0.53	0.00	0.53
33.80	2.00	0.66	5.00	0.53	0.00	0.53
33.85	2.00	0.66	5.00	0.53	0.00	0.53
33.90	2.00	0.66	5.00	0.53	0.00	0.53
33.95	2.00	0.66	5.00	0.53	0.00	0.53
34.00	2.00	0.66	5.00	0.53	0.00	0.53
34.05	2.00	0.66	5.00	0.53	0.00	0.53
34.10	2.00	0.66	5.00	0.53	0.00	0.53
34.15	2.00	0.65	5.00	0.53	0.00	0.53

34.20	2.00	0.65	5.00	0.53	0.00	0.53
34.25	2.00	0.65	5.00	0.53	0.00	0.53
34.30	2.00	0.65	5.00	0.53	0.00	0.53
34.35	2.00	0.65	5.00	0.53	0.00	0.53
34.40	2.00	0.65	5.00	0.53	0.00	0.53
34.45	2.00	0.65	5.00	0.53	0.00	0.53
34.50	2.00	0.65	5.00	0.53	0.00	0.53
34.55	2.00	0.65	5.00	0.53	0.00	0.53
34.60	2.00	0.65	5.00	0.53	0.00	0.53
34.65	2.00	0.65	5.00	0.53	0.00	0.53
34.70	2.00	0.65	5.00	0.53	0.00	0.53
34.75	2.00	0.65	5.00	0.53	0.00	0.53
34.80	2.00	0.65	5.00	0.53	0.00	0.53
34.85	2.00	0.65	5.00	0.53	0.00	0.53
34.90	2.00	0.65	5.00	0.53	0.00	0.53
34.95	2.00	0.65	5.00	0.53	0.00	0.53
35.00	2.00	0.65	5.00	0.53	0.00	0.53
35.05	2.00	0.65	5.00	0.53	0.00	0.53
35.10	2.00	0.65	5.00	0.53	0.00	0.53
35.15	2.00	0.65	5.00	0.53	0.00	0.53
35.20	2.00	0.65	5.00	0.53	0.00	0.53
35.25	2.00	0.65	5.00	0.53	0.00	0.53
35.30	2.00	0.65	5.00	0.53	0.00	0.53
35.35	2.00	0.65	5.00	0.53	0.00	0.53
35.40	2.00	0.65	5.00	0.53	0.00	0.53
35.45	2.00	0.65	5.00	0.53	0.00	0.53
35.50	2.00	0.64	5.00	0.53	0.00	0.53
35.55	2.00	0.64	5.00	0.53	0.00	0.53
35.60	2.00	0.64	5.00	0.53	0.00	0.53
35.65	2.00	0.64	5.00	0.53	0.00	0.53
35.70	2.00	0.64	5.00	0.53	0.00	0.53
35.75	2.00	0.64	5.00	0.53	0.00	0.53
35.80	2.00	0.64	5.00	0.53	0.00	0.53
35.85	2.00	0.64	5.00	0.53	0.00	0.53
35.90	2.00	0.64	5.00	0.53	0.00	0.53
35.95	2.00	0.64	5.00	0.53	0.00	0.53
36.00	2.00	0.64	5.00	0.53	0.00	0.53
36.05	2.00	0.64	5.00	0.53	0.00	0.53
36.10	2.00	0.64	5.00	0.53	0.00	0.53
36.15	2.00	0.64	5.00	0.53	0.00	0.53
36.20	2.00	0.64	5.00	0.53	0.00	0.53
36.25	2.00	0.64	5.00	0.53	0.00	0.53
36.30	2.00	0.64	5.00	0.53	0.00	0.53
36.35	2.00	0.64	5.00	0.53	0.00	0.53
36.40	2.00	0.64	5.00	0.53	0.00	0.53
36.45	2.00	0.64	5.00	0.53	0.00	0.53
36.50	2.00	0.64	5.00	0.53	0.00	0.53
36.55	2.00	0.64	5.00	0.53	0.00	0.53
36.60	2.00	0.64	5.00	0.53	0.00	0.53
36.65	2.00	0.64	5.00	0.53	0.00	0.53
36.70	2.00	0.64	5.00	0.53	0.00	0.53
36.75	2.00	0.64	5.00	0.53	0.00	0.53
36.80	2.00	0.64	5.00	0.53	0.00	0.53
36.85	2.00	0.63	5.00	0.53	0.00	0.53
36.90	2.00	0.63	5.00	0.53	0.00	0.53
36.95	2.00	0.63	5.00	0.53	0.00	0.53
37.00	2.00	0.63	5.00	0.53	0.00	0.53
37.05	2.00	0.63	5.00	0.53	0.00	0.53
37.10	2.00	0.63	5.00	0.53	0.00	0.53
37.15	2.00	0.63	5.00	0.53	0.00	0.53
37.20	2.00	0.63	5.00	0.53	0.00	0.53
37.25	2.00	0.63	5.00	0.53	0.00	0.53
37.30	2.00	0.63	5.00	0.53	0.00	0.53
37.35	2.00	0.63	5.00	0.53	0.00	0.53
37.40	2.00	0.63	5.00	0.53	0.00	0.53
37.45	2.00	0.63	5.00	0.53	0.00	0.53
37.50	2.00	0.63	5.00	0.53	0.00	0.53
37.55	1.61	0.63	2.55	0.53	0.00	0.53
37.60	1.57	0.63	2.49	0.53	0.00	0.53

37.65	1.53	0.63	2.43	0.53	0.00	0.53
37.70	1.49	0.63	2.37	0.53	0.00	0.53
37.75	1.46	0.63	2.32	0.53	0.00	0.53
37.80	1.42	0.63	2.26	0.53	0.00	0.53
37.85	1.39	0.63	2.21	0.53	0.00	0.53
37.90	1.35	0.63	2.15	0.53	0.00	0.53
37.95	1.32	0.63	2.10	0.53	0.00	0.53
38.00	1.28	0.63	2.05	0.53	0.00	0.53
38.05	1.25	0.63	2.00	0.53	0.00	0.53
38.10	1.22	0.63	1.95	0.53	0.00	0.53
38.15	1.19	0.63	1.90	0.53	0.00	0.53
38.20	1.16	0.63	1.85	0.53	0.00	0.53
38.25	1.13	0.62	1.81	0.53	0.00	0.53
38.30	1.10	0.62	1.76	0.53	0.00	0.53
38.35	1.07	0.62	1.72	0.53	0.00	0.53
38.40	1.04	0.62	1.67	0.53	0.00	0.53
38.45	1.02	0.62	1.63	0.53	0.00	0.53
38.50	0.99	0.62	1.59	0.53	0.00	0.53
38.55	0.97	0.62	1.55	0.53	0.00	0.53
38.60	0.94	0.62	1.51	0.53	0.00	0.53
38.65	0.92	0.62	1.48	0.53	0.00	0.53
38.70	0.90	0.62	1.44	0.53	0.00	0.53
38.75	0.87	0.62	1.41	0.53	0.00	0.53
38.80	0.85	0.62	1.37	0.53	0.00	0.53
38.85	0.83	0.62	1.34	0.53	0.00	0.53
38.90	0.81	0.62	1.31	0.53	0.00	0.53
38.95	0.79	0.62	1.27	0.53	0.00	0.53
39.00	0.77	0.62	1.24	0.53	0.00	0.53
39.05	0.75	0.62	1.21	0.53	0.00	0.53
39.10	0.73	0.62	1.18	0.53	0.00	0.53
39.15	0.71	0.62	1.15	0.53	0.00	0.53
39.20	0.69	0.62	1.12	0.53	0.00	0.53
39.25	0.68	0.62	1.09	0.53	0.00	0.53
39.30	0.66	0.62	1.07	0.52	0.00	0.52
39.35	0.64	0.62	1.04	0.52	0.00	0.52
39.40	0.62	0.62	1.01	0.52	0.00	0.52
39.45	0.61	0.62	0.98*	0.52	0.00	0.52
39.50	0.59	0.62	0.96*	0.52	0.00	0.52
39.55	0.60	0.62	0.97*	0.51	0.00	0.51
39.60	0.61	0.62	0.99*	0.51	0.00	0.51
39.65	0.61	0.62	1.00*	0.51	0.00	0.51
39.70	0.62	0.61	1.01	0.50	0.00	0.50
39.75	0.63	0.61	1.03	0.50	0.00	0.50
39.80	0.64	0.61	1.04	0.50	0.00	0.50
39.85	0.65	0.61	1.06	0.50	0.00	0.50
39.90	0.66	0.61	1.07	0.50	0.00	0.50
39.95	0.66	0.61	1.08	0.49	0.00	0.49
40.00	0.67	0.61	1.10	0.49	0.00	0.49
40.05	0.68	0.61	1.11	0.49	0.00	0.49
40.10	0.69	0.61	1.13	0.49	0.00	0.49
40.15	0.70	0.61	1.14	0.49	0.00	0.49
40.20	0.71	0.61	1.16	0.49	0.00	0.49
40.25	0.72	0.61	1.17	0.49	0.00	0.49
40.30	0.73	0.61	1.19	0.48	0.00	0.48
40.35	0.74	0.61	1.21	0.48	0.00	0.48
40.40	0.74	0.61	1.22	0.48	0.00	0.48
40.45	0.75	0.61	1.24	0.48	0.00	0.48
40.50	0.76	0.61	1.25	0.48	0.00	0.48
40.55	0.75	0.61	1.23	0.48	0.00	0.48
40.60	0.74	0.61	1.21	0.48	0.00	0.48
40.65	0.73	0.61	1.19	0.48	0.00	0.48
40.70	0.71	0.61	1.17	0.48	0.00	0.48
40.75	0.70	0.61	1.16	0.48	0.00	0.48
40.80	0.69	0.61	1.14	0.47	0.00	0.47
40.85	0.68	0.61	1.12	0.47	0.00	0.47
40.90	0.67	0.61	1.10	0.47	0.00	0.47
40.95	0.66	0.61	1.08	0.47	0.00	0.47
41.00	0.64	0.61	1.06	0.47	0.00	0.47
41.05	0.63	0.61	1.05	0.46	0.00	0.46

41.10	0.62	0.60	1.03	0.46	0.00	0.46
41.15	0.61	0.60	1.01	0.46	0.00	0.46
41.20	0.60	0.60	0.99*	0.46	0.00	0.46
41.25	0.59	0.60	0.98*	0.45	0.00	0.45
41.30	0.58	0.60	0.96*	0.45	0.00	0.45
41.35	0.57	0.60	0.95*	0.45	0.00	0.45
41.40	0.56	0.60	0.93*	0.44	0.00	0.44
41.45	0.55	0.60	0.91*	0.44	0.00	0.44
41.50	0.55	0.60	0.91*	0.44	0.00	0.44
41.55	0.57	0.60	0.94*	0.43	0.00	0.43
41.60	0.59	0.60	0.98*	0.43	0.00	0.43
41.65	0.61	0.60	1.02	0.42	0.00	0.42
41.70	0.64	0.60	1.06	0.42	0.00	0.42
41.75	0.66	0.60	1.10	0.42	0.00	0.42
41.80	0.68	0.60	1.14	0.42	0.00	0.42
41.85	0.71	0.60	1.18	0.42	0.00	0.42
41.90	0.74	0.60	1.23	0.42	0.00	0.42
41.95	0.76	0.60	1.27	0.41	0.00	0.41
42.00	0.79	0.60	1.32	0.41	0.00	0.41
42.05	0.82	0.60	1.37	0.41	0.00	0.41
42.10	0.85	0.60	1.41	0.41	0.00	0.41
42.15	0.88	0.60	1.46	0.41	0.00	0.41
42.20	0.91	0.60	1.52	0.41	0.00	0.41
42.25	0.94	0.60	1.57	0.41	0.00	0.41
42.30	0.97	0.60	1.62	0.41	0.00	0.41
42.35	1.00	0.60	1.68	0.41	0.00	0.41
42.40	1.03	0.60	1.73	0.41	0.00	0.41
42.45	1.07	0.60	1.79	0.41	0.00	0.41
42.50	1.11	0.60	1.87	0.41	0.00	0.41
42.55	1.22	0.60	2.05	0.41	0.00	0.41
42.60	1.33	0.59	2.23	0.41	0.00	0.41
42.65	1.45	0.59	2.43	0.41	0.00	0.41
42.70	1.57	0.59	2.64	0.41	0.00	0.41
42.75	1.70	0.59	2.87	0.41	0.00	0.41
42.80	1.84	0.59	3.10	0.41	0.00	0.41
42.85	1.99	0.59	3.35	0.41	0.00	0.41
42.90	2.14	0.59	3.61	0.41	0.00	0.41
42.95	2.30	0.59	3.89	0.41	0.00	0.41
43.00	2.39	0.59	4.04	0.41	0.00	0.41
43.05	2.39	0.59	4.04	0.41	0.00	0.41
43.10	2.39	0.59	4.05	0.41	0.00	0.41
43.15	2.39	0.59	4.05	0.41	0.00	0.41
43.20	2.39	0.59	4.05	0.41	0.00	0.41
43.25	2.39	0.59	4.05	0.41	0.00	0.41
43.30	2.39	0.59	4.05	0.41	0.00	0.41
43.35	2.39	0.59	4.06	0.41	0.00	0.41
43.40	2.39	0.59	4.06	0.41	0.00	0.41
43.45	2.39	0.59	4.06	0.41	0.00	0.41
43.50	2.39	0.59	4.06	0.41	0.00	0.41
43.55	2.39	0.59	4.07	0.41	0.00	0.41
43.60	2.39	0.59	4.07	0.41	0.00	0.41
43.65	2.39	0.59	4.07	0.41	0.00	0.41
43.70	2.39	0.59	4.07	0.41	0.00	0.41
43.75	2.39	0.59	4.08	0.41	0.00	0.41
43.80	2.39	0.59	4.08	0.41	0.00	0.41
43.85	2.39	0.59	4.08	0.41	0.00	0.41
43.90	2.39	0.59	4.08	0.41	0.00	0.41
43.95	2.39	0.59	4.08	0.41	0.00	0.41
44.00	2.39	0.59	4.09	0.41	0.00	0.41
44.05	2.39	0.59	4.09	0.41	0.00	0.41
44.10	2.39	0.58	4.09	0.41	0.00	0.41
44.15	2.39	0.58	4.09	0.41	0.00	0.41
44.20	2.39	0.58	4.10	0.41	0.00	0.41
44.25	2.39	0.58	4.10	0.41	0.00	0.41
44.30	2.39	0.58	4.10	0.41	0.00	0.41
44.35	2.39	0.58	4.10	0.41	0.00	0.41
44.40	2.39	0.58	4.11	0.41	0.00	0.41
44.45	2.39	0.58	4.11	0.41	0.00	0.41
44.50	2.39	0.58	4.11	0.41	0.00	0.41
44.55	2.39	0.58	4.11	0.41	0.00	0.41
44.60	2.39	0.58	4.12	0.41	0.00	0.41
44.65	2.39	0.58	4.12	0.41	0.00	0.41
44.70	2.39	0.58	4.12	0.41	0.00	0.41
44.75	2.39	0.58	4.12	0.41	0.00	0.41
44.80	2.39	0.58	4.12	0.41	0.00	0.41
44.85	2.39	0.58	4.13	0.41	0.00	0.41
44.90	2.39	0.58	4.13	0.41	0.00	0.41
44.95	2.39	0.58	4.13	0.41	0.00	0.41
45.00	2.39	0.58	4.13	0.41	0.00	0.41
45.05	2.39	0.58	4.14	0.41	0.00	0.41
45.10	2.39	0.58	4.14	0.41	0.00	0.41
45.15	2.39	0.58	4.14	0.41	0.00	0.41
45.20	2.39	0.58	4.14	0.41	0.00	0.41
45.25	2.39	0.58	4.15	0.41	0.00	0.41
45.30	2.39	0.58	4.15	0.41	0.00	0.41
45.35	2.39	0.58	4.15	0.41	0.00	0.41
45.40	2.39	0.58	4.15	0.41	0.00	0.41
45.45	2.39	0.58	4.16	0.41	0.00	0.41
45.50	2.39	0.58	4.16	0.41	0.00	0.41
45.55	2.39	0.58	4.16	0.41	0.00	0.41
45.60	2.39	0.57	4.16	0.41	0.00	0.41
45.65	2.39	0.57	4.16	0.41	0.00	0.41
45.70	2.39	0.57	4.17	0.41	0.00	0.41
45.75	2.39	0.57	4.17	0.41	0.00	0.41
45.80	2.39	0.57	4.17	0.41	0.00	0.41
45.85	2.39	0.57	4.17	0.41	0.00	0.41
45.90	2.39	0.57	4.18	0.41	0.00	0.41
45.95	2.39	0.57	4.18	0.41	0.00	0.41
46.00	2.39	0.57	4.18	0.41	0.00	0.41
46.05	2.39	0.57	4.18	0.41	0.00	0.41
46.10	2.39	0.57	4.19	0.41	0.00	0.41
46.15	2.39	0.57	4.19	0.41	0.00	0.41
46.20	2.39	0.57	4.19	0.41	0.00	0.41
46.25	2.39	0.57	4.19	0.41	0.00	0.41
46.30	2.39	0.57	4.20	0.41	0.00	0.41
46.35	2.39	0.57	4.20	0.41	0.00	0.41
46.40	2.39	0.57	4.20	0.41	0.00	0.41
46.45	2.39	0.57	4.20	0.41	0.00	0.41
46.50	2.39	0.57	4.21	0.41	0.00	0.41
46.55	2.39	0.57	4.21	0.41	0.00	0.41
46.60	2.39	0.57	4.21	0.41	0.00	0.41
46.65	2.39	0.57	4.21	0.41	0.00	0.41
46.70	2.39	0.57	4.22	0.41	0.00	0.41
46.75	2.39	0.57	4.22	0.41	0.00	0.41
46.80	2.39	0.57	4.22	0.41	0.00	0.41
46.85	2.39	0.57	4.22	0.41	0.00	0.41
46.90	2.39	0.57	4.23	0.41	0.00	0.41
46.95	2.39	0.57	4.23	0.41	0.00	0.41
47.00	2.39	0.57	4.23	0.41	0.00	0.41
47.05	2.39	0.57	4.23	0.41	0.00	0.41
47.10	2.27	0.56	4.03	0.41	0.00	0.41
47.15	2.11	0.56	3.73	0.41	0.00	0.41
47.20	1.95	0.56	3.45	0.41	0.00	0.41
47.25	1.80	0.56	3.18	0.41	0.00	0.41
47.30	1.65	0.56	2.93	0.41	0.00	0.41
47.35	1.52	0.56	2.70	0.41	0.00	0.41
47.40	1.39	0.56	2.47	0.41	0.00	0.41
47.45	1.27	0.56	2.26	0.41	0.00	0.41
47.50	1.20	0.56	2.14	0.41	0.00	0.41
47.55	1.31	0.56	2.32	0.41	0.00	0.41
47.60	1.41	0.56	2.52	0.41	0.00	0.41
47.65	1.53	0.56	2.72	0.41	0.00	0.41
47.70	1.65	0.56	2.94	0.41	0.00	0.41
47.75	1.77	0.56	3.16	0.41	0.00	0.41
47.80	1.91	0.56	3.40	0.41	0.00	0.41
47.85	2.05	0.56	3.66	0.41	0.00	0.41
47.90	2.19	0.56	3.92	0.41	0.00	0.41
47.95	2.35	0.56	4.20	0.41	0.00	0.41

48.00	2.39	0.56	4.28	0.41	0.00	0.41
48.05	2.39	0.56	4.28	0.41	0.00	0.41
48.10	2.39	0.56	4.28	0.41	0.00	0.41
48.15	2.39	0.56	4.29	0.41	0.00	0.41
48.20	2.39	0.56	4.29	0.41	0.00	0.41
48.25	2.39	0.56	4.29	0.41	0.00	0.41
48.30	2.39	0.56	4.29	0.41	0.00	0.41
48.35	2.39	0.56	4.30	0.41	0.00	0.41
48.40	2.39	0.56	4.30	0.41	0.00	0.41
48.45	2.39	0.56	4.30	0.41	0.00	0.41
48.50	2.39	0.56	4.30	0.41	0.00	0.41
48.55	2.39	0.56	4.31	0.41	0.00	0.41
48.60	2.39	0.56	4.31	0.41	0.00	0.41
48.65	2.39	0.55	4.31	0.41	0.00	0.41
48.70	2.39	0.55	4.31	0.41	0.00	0.41
48.75	2.39	0.55	4.32	0.41	0.00	0.41
48.80	2.39	0.55	4.32	0.41	0.00	0.41
48.85	2.39	0.55	4.32	0.41	0.00	0.41
48.90	2.39	0.55	4.32	0.41	0.00	0.41
48.95	2.39	0.55	4.33	0.41	0.00	0.41
49.00	2.39	0.55	4.33	0.41	0.00	0.41
49.05	2.39	0.55	4.33	0.41	0.00	0.41
49.10	2.39	0.55	4.33	0.41	0.00	0.41
49.15	2.39	0.55	4.34	0.41	0.00	0.41
49.20	2.39	0.55	4.34	0.41	0.00	0.41
49.25	2.39	0.55	4.34	0.41	0.00	0.41
49.30	2.39	0.55	4.34	0.41	0.00	0.41
49.35	2.39	0.55	4.35	0.41	0.00	0.41
49.40	2.39	0.55	4.35	0.41	0.00	0.41
49.45	2.39	0.55	4.35	0.41	0.00	0.41
49.50	2.39	0.55	4.35	0.41	0.00	0.41
49.55	2.39	0.55	4.36	0.41	0.00	0.41
49.60	2.39	0.55	4.36	0.41	0.00	0.41
49.65	2.39	0.55	4.36	0.41	0.00	0.41
49.70	2.39	0.55	4.36	0.41	0.00	0.41
49.75	2.39	0.55	4.37	0.41	0.00	0.41
49.80	2.39	0.55	4.37	0.41	0.00	0.41
49.85	2.39	0.55	4.37	0.41	0.00	0.41
49.90	2.39	0.55	4.37	0.41	0.00	0.41
49.95	2.39	0.55	4.38	0.41	0.00	0.41
50.00	2.39	0.55	4.38	0.41	0.00	0.41
50.05	2.39	0.55	4.38	0.41	0.00	0.41
50.10	2.39	0.55	4.38	0.41	0.00	0.41
50.15	2.39	0.55	4.39	0.41	0.00	0.41
50.20	2.39	0.54	4.39	0.41	0.00	0.41
50.25	2.39	0.54	4.39	0.41	0.00	0.41
50.30	2.39	0.54	4.40	0.41	0.00	0.41
50.35	2.39	0.54	4.40	0.41	0.00	0.41
50.40	2.39	0.54	4.40	0.41	0.00	0.41
50.45	2.39	0.54	4.40	0.41	0.00	0.41
50.50	2.39	0.54	4.41	0.41	0.00	0.41
50.55	2.39	0.54	4.41	0.41	0.00	0.41
50.60	2.39	0.54	4.41	0.41	0.00	0.41
50.65	2.39	0.54	4.41	0.41	0.00	0.41
50.70	2.39	0.54	4.42	0.41	0.00	0.41
50.75	2.39	0.54	4.42	0.41	0.00	0.41
50.80	2.39	0.54	4.42	0.41	0.00	0.41
50.85	2.39	0.54	4.42	0.41	0.00	0.41
50.90	2.39	0.54	4.43	0.41	0.00	0.41
50.95	2.39	0.54	4.43	0.41	0.00	0.41
51.00	2.39	0.54	4.43	0.41	0.00	0.41
51.05	2.39	0.54	4.43	0.41	0.00	0.41
51.10	2.39	0.54	4.44	0.41	0.00	0.41
51.15	2.39	0.54	4.44	0.41	0.00	0.41
51.20	2.39	0.54	4.44	0.41	0.00	0.41
51.25	2.39	0.54	4.44	0.41	0.00	0.41
51.30	2.39	0.54	4.45	0.41	0.00	0.41
51.35	2.39	0.54	4.45	0.41	0.00	0.41
51.40	2.38	0.54	4.43	0.41	0.00	0.41
51.45	2.35	0.54	4.37	0.41	0.00	0.41
51.50	2.31	0.54	4.30	0.41	0.00	0.41
51.55	2.23	0.54	4.16	0.41	0.00	0.41
51.60	2.16	0.54	4.03	0.41	0.00	0.41
51.65	2.09	0.54	3.90	0.41	0.00	0.41
51.70	2.02	0.54	3.77	0.41	0.00	0.41
51.75	1.95	0.54	3.64	0.41	0.00	0.41
51.80	1.88	0.53	3.52	0.41	0.00	0.41
51.85	1.82	0.53	3.40	0.41	0.00	0.41
51.90	1.75	0.53	3.28	0.41	0.00	0.41
51.95	1.69	0.53	3.17	0.41	0.00	0.41
52.00	1.63	0.53	3.06	0.41	0.00	0.41
52.05	1.57	0.53	2.95	0.41	0.00	0.41
52.10	1.52	0.53	2.84	0.41	0.00	0.41
52.15	1.46	0.53	2.74	0.41	0.00	0.41
52.20	1.41	0.53	2.64	0.41	0.00	0.41
52.25	1.35	0.53	2.54	0.41	0.00	0.41
52.30	1.30	0.53	2.45	0.41	0.00	0.41
52.35	1.25	0.53	2.36	0.41	0.00	0.41
52.40	1.20	0.53	2.27	0.41	0.00	0.41
52.45	1.16	0.53	2.18	0.41	0.00	0.41
52.50	1.11	0.53	2.09	0.41	0.00	0.41
52.55	1.07	0.53	2.01	0.41	0.00	0.41
52.60	1.02	0.53	1.92	0.41	0.00	0.41
52.65	0.97	0.53	1.83	0.41	0.00	0.41
52.70	0.92	0.53	1.75	0.41	0.00	0.41
52.75	0.88	0.53	1.66	0.41	0.00	0.41
52.80	0.84	0.53	1.58	0.41	0.00	0.41
52.85	0.80	0.53	1.51	0.41	0.00	0.41
52.90	0.76	0.53	1.43	0.41	0.00	0.41
52.95	0.72	0.53	1.36	0.41	0.00	0.41
53.00	0.68	0.53	1.29	0.41	0.00	0.41
53.05	0.65	0.53	1.23	0.41	0.00	0.41
53.10	0.61	0.53	1.16	0.41	0.00	0.41
53.15	0.58	0.53	1.10	0.41	0.00	0.41
53.20	0.55	0.53	1.05	0.40	0.00	0.40
53.25	0.52	0.53	0.99*	0.40	0.00	0.40
53.30	0.49	0.53	0.94*	0.40	0.00	0.40
53.35	0.48	0.53	0.91*	0.39	0.00	0.39
53.40	0.46	0.52	0.88*	0.39	0.00	0.39
53.45	0.44	0.52	0.85*	0.38	0.00	0.38
53.50	0.44	0.52	0.83*	0.38	0.00	0.38
53.55	0.45	0.52	0.86*	0.37	0.00	0.37
53.60	0.47	0.52	0.89*	0.37	0.00	0.37
53.65	0.49	0.52	0.93*	0.36	0.00	0.36
53.70	0.50	0.52	0.96*	0.36	0.00	0.36
53.75	0.52	0.52	1.00*	0.36	0.00	0.36
53.80	0.54	0.52	1.03	0.35	0.00	0.35
53.85	0.56	0.52	1.07	0.35	0.00	0.35
53.90	0.58	0.52	1.10	0.35	0.00	0.35
53.95	0.60	0.52	1.14	0.35	0.00	0.35
54.00	0.62	0.52	1.18	0.35	0.00	0.35
54.05	0.64	0.52	1.22	0.35	0.00	0.35
54.10	0.66	0.52	1.26	0.34	0.00	0.34
54.15	0.68	0.52	1.31	0.34	0.00	0.34
54.20	0.70	0.52	1.35	0.34	0.00	0.34
54.25	0.72	0.52	1.39	0.34	0.00	0.34
54.30	0.75	0.52	1.44	0.34	0.00	0.34
54.35	0.77	0.52	1.49	0.34	0.00	0.34
54.40	0.79	0.52	1.53	0.34	0.00	0.34
54.45	0.82	0.52	1.58	0.34	0.00	0.34
54.50	0.84	0.52	1.62	0.34	0.00	0.34
54.55	0.83	0.52	1.61	0.34	0.00	0.34
54.60	0.83	0.52	1.60	0.34	0.00	0.34
54.65	0.83	0.52	1.60	0.34	0.00	0.34
54.70	0.83	0.52	1.60	0.34	0.00	0.34
54.75	0.83	0.52	1.61	0.34	0.00	0.34
54.80	0.83	0.52	1.61	0.34	0.00	0.34
54.85	0.83	0.52	1.61	0.34	0.00	0.34

54.90	0.83	0.52	1.61	0.34	0.00	0.34
54.95	0.83	0.52	1.62	0.34	0.00	0.34
55.00	0.83	0.51	1.62	0.34	0.00	0.34
55.05	0.83	0.51	1.62	0.34	0.00	0.34
55.10	0.83	0.51	1.62	0.34	0.00	0.34
55.15	0.84	0.51	1.63	0.34	0.00	0.34
55.20	0.84	0.51	1.63	0.34	0.00	0.34
55.25	0.84	0.51	1.63	0.34	0.00	0.34
55.30	0.84	0.51	1.63	0.34	0.00	0.34
55.35	0.84	0.51	1.64	0.34	0.00	0.34
55.40	0.84	0.51	1.64	0.34	0.00	0.34
55.45	0.84	0.51	1.64	0.34	0.00	0.34
55.50	0.84	0.51	1.65	0.34	0.00	0.34
55.55	0.86	0.51	1.68	0.34	0.00	0.34
55.60	0.88	0.51	1.72	0.34	0.00	0.34
55.65	0.89	0.51	1.75	0.34	0.00	0.34
55.70	0.91	0.51	1.79	0.34	0.00	0.34
55.75	0.93	0.51	1.82	0.34	0.00	0.34
55.80	0.95	0.51	1.86	0.34	0.00	0.34
55.85	0.96	0.51	1.89	0.34	0.00	0.34
55.90	0.98	0.51	1.93	0.34	0.00	0.34
55.95	1.00	0.51	1.97	0.34	0.00	0.34
56.00	1.02	0.51	2.00	0.34	0.00	0.34
56.05	1.04	0.51	2.04	0.34	0.00	0.34
56.10	1.06	0.51	2.08	0.34	0.00	0.34
56.15	1.08	0.51	2.12	0.34	0.00	0.34
56.20	1.10	0.51	2.16	0.34	0.00	0.34
56.25	1.12	0.51	2.20	0.34	0.00	0.34
56.30	1.14	0.51	2.24	0.34	0.00	0.34
56.35	1.16	0.51	2.28	0.34	0.00	0.34
56.40	1.18	0.51	2.32	0.34	0.00	0.34
56.45	1.20	0.51	2.37	0.34	0.00	0.34
56.50	1.21	0.51	2.40	0.34	0.00	0.34
56.55	1.21	0.51	2.40	0.34	0.00	0.34
56.60	1.21	0.50	2.41	0.34	0.00	0.34
56.65	1.22	0.50	2.41	0.34	0.00	0.34
56.70	1.22	0.50	2.41	0.34	0.00	0.34
56.75	1.22	0.50	2.41	0.34	0.00	0.34
56.80	1.22	0.50	2.42	0.34	0.00	0.34
56.85	1.22	0.50	2.42	0.34	0.00	0.34
56.90	1.22	0.50	2.42	0.34	0.00	0.34
56.95	1.22	0.50	2.42	0.34	0.00	0.34
57.00	1.22	0.50	2.43	0.34	0.00	0.34
57.05	1.22	0.50	2.43	0.34	0.00	0.34
57.10	1.22	0.50	2.43	0.34	0.00	0.34
57.15	1.22	0.50	2.44	0.34	0.00	0.34
57.20	1.22	0.50	2.44	0.34	0.00	0.34
57.25	1.22	0.50	2.44	0.34	0.00	0.34
57.30	1.22	0.50	2.44	0.34	0.00	0.34
57.35	1.22	0.50	2.45	0.34	0.00	0.34
57.40	1.22	0.50	2.45	0.34	0.00	0.34
57.45	1.23	0.50	2.45	0.34	0.00	0.34
57.50	1.23	0.50	2.45	0.34	0.00	0.34
57.55	1.23	0.50	2.46	0.34	0.00	0.34
57.60	1.23	0.50	2.46	0.34	0.00	0.34
57.65	1.23	0.50	2.46	0.34	0.00	0.34
57.70	1.23	0.50	2.46	0.34	0.00	0.34
57.75	1.23	0.50	2.47	0.34	0.00	0.34
57.80	1.23	0.50	2.47	0.34	0.00	0.34
57.85	1.23	0.50	2.47	0.34	0.00	0.34
57.90	1.23	0.50	2.47	0.34	0.00	0.34
57.95	1.23	0.50	2.48	0.34	0.00	0.34
58.00	1.23	0.50	2.48	0.34	0.00	0.34
58.05	1.23	0.50	2.48	0.34	0.00	0.34
58.10	1.23	0.50	2.48	0.34	0.00	0.34
58.15	1.23	0.50	2.49	0.34	0.00	0.34
58.20	1.23	0.49	2.49	0.34	0.00	0.34
58.25	1.23	0.49	2.49	0.34	0.00	0.34
58.30	1.23	0.49	2.49	0.34	0.00	0.34

58.35	1.23	0.49	2.50	0.34	0.00	0.34
58.40	1.23	0.49	2.50	0.34	0.00	0.34
58.45	1.23	0.49	2.50	0.34	0.00	0.34
58.50	1.23	0.49	2.50	0.34	0.00	0.34
58.55	1.24	0.49	2.51	0.34	0.00	0.34
58.60	1.24	0.49	2.51	0.34	0.00	0.34
58.65	1.24	0.49	2.51	0.34	0.00	0.34
58.70	1.24	0.49	2.52	0.34	0.00	0.34
58.75	1.24	0.49	2.52	0.34	0.00	0.34
58.80	1.24	0.49	2.53	0.34	0.00	0.34
58.85	1.24	0.49	2.53	0.34	0.00	0.34
58.90	1.24	0.49	2.53	0.34	0.00	0.34
58.95	1.24	0.49	2.54	0.34	0.00	0.34
59.00	1.25	0.49	2.54	0.34	0.00	0.34
59.05	1.25	0.49	2.54	0.34	0.00	0.34
59.10	1.25	0.49	2.55	0.34	0.00	0.34
59.15	1.25	0.49	2.55	0.34	0.00	0.34
59.20	1.25	0.49	2.56	0.34	0.00	0.34
59.25	1.25	0.49	2.56	0.34	0.00	0.34
59.30	1.26	0.49	2.58	0.34	0.00	0.34
59.35	1.27	0.49	2.60	0.34	0.00	0.34
59.40	1.28	0.49	2.62	0.34	0.00	0.34
59.45	1.29	0.49	2.64	0.34	0.00	0.34
59.50	1.30	0.49	2.67	0.34	0.00	0.34
59.55	1.34	0.49	2.75	0.34	0.00	0.34
59.60	1.37	0.49	2.82	0.34	0.00	0.34
59.65	1.41	0.49	2.90	0.34	0.00	0.34
59.70	1.46	0.49	3.00	0.34	0.00	0.34
59.75	1.51	0.49	3.11	0.34	0.00	0.34
59.80	1.56	0.49	3.22	0.34	0.00	0.34
59.85	1.62	0.48	3.33	0.34	0.00	0.34
59.90	1.67	0.48	3.45	0.34	0.00	0.34
59.95	1.73	0.48	3.57	0.34	0.00	0.34
60.00	1.79	0.48	3.69	0.34	0.00	0.34
60.05	1.84	0.48	3.81	0.34	0.00	0.34
60.10	1.90	0.48	3.94	0.34	0.00	0.34
60.15	1.97	0.48	4.07	0.34	0.00	0.34
60.20	2.03	0.48	4.20	0.34	0.00	0.34
60.25	2.09	0.48	4.34	0.34	0.00	0.34
60.30	2.16	0.48	4.48	0.34	0.00	0.34
60.35	2.23	0.48	4.62	0.34	0.00	0.34
60.40	2.29	0.48	4.76	0.34	0.00	0.34
60.45	2.35	0.48	4.89	0.34	0.00	0.34
60.50	2.35	0.48	4.89	0.34	0.00	0.34
60.55	2.35	0.48	4.89	0.34	0.00	0.34
60.60	2.35	0.48	4.89	0.34	0.00	0.34
60.65	2.35	0.48	4.90	0.34	0.00	0.34
60.70	2.35	0.48	4.90	0.34	0.00	0.34
60.75	2.35	0.48	4.90	0.34	0.00	0.34
60.80	2.35	0.48	4.90	0.34	0.00	0.34
60.85	2.35	0.48	4.91	0.34	0.00	0.34
60.90	2.35	0.48	4.91	0.34	0.00	0.34
60.95	2.35	0.48	4.91	0.34	0.00	0.34
61.00	2.35	0.48	4.91	0.34	0.00	0.34
61.05	2.35	0.48	4.92	0.34	0.00	0.34
61.10	2.35	0.48	4.92	0.34	0.00	0.34
61.15	2.35	0.48	4.92	0.34	0.00	0.34
61.20	2.35	0.48	4.92	0.34	0.00	0.34
61.25	2.35	0.48	4.93	0.34	0.00	0.34
61.30	2.35	0.48	4.93	0.34	0.00	0.34
61.35	2.35	0.48	4.93	0.34	0.00	0.34
61.40	2.35	0.48	4.93	0.34	0.00	0.34
61.45	2.35	0.48	4.94	0.34	0.00	0.34
61.50	2.34	0.47	4.94	0.34	0.00	0.34
61.55	2.34	0.47	4.94	0.34	0.00	0.34
61.60	2.34	0.47	4.94	0.34	0.00	0.34
61.65	2.34	0.47	4.95	0.34	0.00	0.34
61.70	2.34	0.47	4.95	0.34	0.00	0.34
61.75	2.34	0.47	4.95	0.34	0.00	0.34

61.80	2.34	0.47	4.95	0.34	0.00	0.34
61.85	2.34	0.47	4.96	0.34	0.00	0.34
61.90	2.34	0.47	4.96	0.34	0.00	0.34
61.95	2.34	0.47	4.96	0.34	0.00	0.34
62.00	2.34	0.47	4.96	0.34	0.00	0.34
62.05	2.34	0.47	4.96	0.34	0.00	0.34
62.10	2.34	0.47	4.97	0.34	0.00	0.34
62.15	2.34	0.47	4.97	0.34	0.00	0.34
62.20	2.34	0.47	4.97	0.34	0.00	0.34
62.25	2.34	0.47	4.97	0.34	0.00	0.34
62.30	2.34	0.47	4.98	0.34	0.00	0.34
62.35	2.34	0.47	4.98	0.34	0.00	0.34
62.40	2.34	0.47	4.98	0.34	0.00	0.34
62.45	2.34	0.47	4.98	0.34	0.00	0.34
62.50	2.34	0.47	4.99	0.34	0.00	0.34
62.55	2.34	0.47	4.99	0.34	0.00	0.34
62.60	2.34	0.47	4.99	0.34	0.00	0.34
62.65	2.31	0.47	4.93	0.34	0.00	0.34
62.70	2.26	0.47	4.84	0.34	0.00	0.34
62.75	2.22	0.47	4.75	0.34	0.00	0.34
62.80	2.18	0.47	4.66	0.34	0.00	0.34
62.85	2.13	0.47	4.57	0.34	0.00	0.34
62.90	2.09	0.47	4.48	0.34	0.00	0.34
62.95	2.05	0.47	4.40	0.34	0.00	0.34
63.00	2.01	0.47	4.31	0.34	0.00	0.34
63.05	1.97	0.47	4.23	0.34	0.00	0.34
63.10	1.93	0.47	4.15	0.34	0.00	0.34
63.15	1.89	0.46	4.07	0.34	0.00	0.34
63.20	1.85	0.46	3.99	0.34	0.00	0.34
63.25	1.82	0.46	3.91	0.34	0.00	0.34
63.30	1.78	0.46	3.83	0.34	0.00	0.34
63.35	1.74	0.46	3.76	0.34	0.00	0.34
63.40	1.71	0.46	3.68	0.34	0.00	0.34
63.45	1.67	0.46	3.61	0.34	0.00	0.34
63.50	1.64	0.46	3.55	0.34	0.00	0.34
63.55	1.63	0.46	3.52	0.34	0.00	0.34
63.60	1.62	0.46	3.50	0.34	0.00	0.34
63.65	1.60	0.46	3.47	0.34	0.00	0.34
63.70	1.59	0.46	3.45	0.34	0.00	0.34
63.75	1.58	0.46	3.42	0.34	0.00	0.34
63.80	1.57	0.46	3.40	0.34	0.00	0.34
63.85	1.56	0.46	3.38	0.34	0.00	0.34
63.90	1.54	0.46	3.35	0.34	0.00	0.34
63.95	1.53	0.46	3.33	0.34	0.00	0.34
64.00	1.52	0.46	3.31	0.34	0.00	0.34
64.05	1.51	0.46	3.28	0.34	0.00	0.34
64.10	1.50	0.46	3.26	0.34	0.00	0.34
64.15	1.49	0.46	3.24	0.34	0.00	0.34
64.20	1.47	0.46	3.22	0.34	0.00	0.34
64.25	1.46	0.46	3.19	0.34	0.00	0.34
64.30	1.45	0.46	3.17	0.34	0.00	0.34
64.35	1.44	0.46	3.15	0.34	0.00	0.34
64.40	1.43	0.46	3.13	0.34	0.00	0.34
64.45	1.42	0.46	3.10	0.34	0.00	0.34
64.50	1.41	0.46	3.09	0.34	0.00	0.34
64.55	1.41	0.46	3.10	0.34	0.00	0.34
64.60	1.42	0.46	3.11	0.34	0.00	0.34
64.65	1.42	0.46	3.12	0.34	0.00	0.34
64.70	1.43	0.46	3.13	0.34	0.00	0.34
64.75	1.43	0.46	3.14	0.34	0.00	0.34
64.80	1.43	0.45	3.15	0.34	0.00	0.34
64.85	1.44	0.45	3.16	0.34	0.00	0.34
64.90	1.44	0.45	3.17	0.34	0.00	0.34
64.95	1.44	0.45	3.18	0.34	0.00	0.34
65.00	1.45	0.45	3.19	0.34	0.00	0.34
65.05	1.45	0.45	3.20	0.34	0.00	0.34
65.10	1.45	0.45	3.21	0.34	0.00	0.34
65.15	1.46	0.45	3.22	0.34	0.00	0.34
65.20	1.46	0.45	3.23	0.34	0.00	0.34
65.25	1.47	0.45	3.24	0.34	0.00	0.34
65.30	1.47	0.45	3.25	0.34	0.00	0.34
65.35	1.47	0.45	3.26	0.34	0.00	0.34
65.40	1.48	0.45	3.27	0.34	0.00	0.34
65.45	1.48	0.45	3.28	0.34	0.00	0.34
65.50	1.47	0.45	3.26	0.34	0.00	0.34
65.55	1.39	0.45	3.09	0.34	0.00	0.34
65.60	1.31	0.45	2.92	0.34	0.00	0.34
65.65	1.24	0.45	2.76	0.34	0.00	0.34
65.70	1.17	0.45	2.61	0.34	0.00	0.34
65.75	1.11	0.45	2.46	0.34	0.00	0.34
65.80	1.04	0.45	2.32	0.34	0.00	0.34
65.85	0.98	0.45	2.19	0.34	0.00	0.34
65.90	0.92	0.45	2.06	0.34	0.00	0.34
65.95	0.87	0.45	1.94	0.34	0.00	0.34
66.00	0.82	0.45	1.82	0.34	0.00	0.34
66.05	0.78	0.45	1.74	0.34	0.00	0.34
66.10	0.74	0.45	1.66	0.34	0.00	0.34
66.15	0.70	0.45	1.58	0.34	0.00	0.34
66.20	0.67	0.45	1.50	0.34	0.00	0.34
66.25	0.64	0.45	1.43	0.34	0.00	0.34
66.30	0.61	0.45	1.36	0.34	0.00	0.34
66.35	0.58	0.45	1.30	0.34	0.00	0.34
66.40	0.55	0.45	1.23	0.34	0.00	0.34
66.45	0.52	0.45	1.17	0.34	0.00	0.34
66.50	0.50	0.44	1.13	0.34	0.00	0.34
66.55	0.51	0.44	1.15	0.34	0.00	0.34
66.60	0.52	0.44	1.16	0.34	0.00	0.34
66.65	0.52	0.44	1.18	0.33	0.00	0.33
66.70	0.53	0.44	1.20	0.33	0.00	0.33
66.75	0.54	0.44	1.21	0.33	0.00	0.33
66.80	0.55	0.44	1.23	0.33	0.00	0.33
66.85	0.55	0.44	1.25	0.33	0.00	0.33
66.90	0.56	0.44	1.27	0.33	0.00	0.33
66.95	0.57	0.44	1.29	0.33	0.00	0.33
67.00	0.58	0.44	1.30	0.33	0.00	0.33
67.05	0.58	0.44	1.32	0.33	0.00	0.33
67.10	0.59	0.44	1.34	0.33	0.00	0.33
67.15	0.60	0.44	1.36	0.33	0.00	0.33
67.20	0.61	0.44	1.38	0.33	0.00	0.33
67.25	0.62	0.44	1.40	0.33	0.00	0.33
67.30	0.62	0.44	1.42	0.33	0.00	0.33
67.35	0.63	0.44	1.44	0.33	0.00	0.33
67.40	0.64	0.44	1.46	0.33	0.00	0.33
67.45	0.65	0.44	1.48	0.33	0.00	0.33
67.50	0.65	0.44	1.49	0.33	0.00	0.33
67.55	0.64	0.44	1.47	0.33	0.00	0.33
67.60	0.64	0.44	1.45	0.33	0.00	0.33
67.65	0.63	0.44	1.43	0.33	0.00	0.33
67.70	0.62	0.44	1.41	0.33	0.00	0.33
67.75	0.61	0.44	1.40	0.33	0.00	0.33
67.80	0.60	0.44	1.38	0.33	0.00	0.33
67.85	0.59	0.44	1.36	0.33	0.00	0.33
67.90	0.59	0.44	1.34	0.32	0.00	0.32
67.95	0.58	0.44	1.33	0.32	0.00	0.32
68.00	0.57	0.44	1.31	0.32	0.00	0.32
68.05	0.56	0.44	1.29	0.32	0.00	0.32
68.10	0.56	0.44	1.28	0.32	0.00	0.32
68.15	0.55	0.43	1.26	0.32	0.00	0.32
68.20	0.54	0.43	1.25	0.32	0.00	0.32
68.25	0.53	0.43	1.23	0.32	0.00	0.32
68.30	0.53	0.43	1.22	0.32	0.00	0.32
68.35	0.52	0.43	1.20	0.32	0.00	0.32
68.40	0.51	0.43	1.19	0.32	0.00	0.32
68.45	0.51	0.43	1.17	0.32	0.00	0.32
68.50	0.50	0.43	1.16	0.32	0.00	0.32
68.55	0.50	0.43	1.15	0.32	0.00	0.32
68.60	0.49	0.43	1.14	0.32	0.00	0.32
68.65	0.49	0.43	1.14	0.32	0.00	0.32

68.70	0.49	0.43	1.13	0.32	0.00	0.32
68.75	0.48	0.43	1.12	0.32	0.00	0.32
68.80	0.48	0.43	1.11	0.32	0.00	0.32
68.85	0.47	0.43	1.10	0.31	0.00	0.31
68.90	0.47	0.43	1.09	0.31	0.00	0.31
68.95	0.47	0.43	1.09	0.31	0.00	0.31
69.00	0.46	0.43	1.08	0.31	0.00	0.31
69.05	0.46	0.43	1.07	0.31	0.00	0.31
69.10	0.46	0.43	1.06	0.31	0.00	0.31
69.15	0.45	0.43	1.05	0.30	0.00	0.30
69.20	0.45	0.43	1.05	0.30	0.00	0.30
69.25	0.45	0.43	1.04	0.30	0.00	0.30
69.30	0.44	0.43	1.03	0.30	0.00	0.30
69.35	0.44	0.43	1.02	0.29	0.00	0.29
69.40	0.43	0.43	1.02	0.29	0.00	0.29
69.45	0.43	0.43	1.01	0.29	0.00	0.29
69.50	0.43	0.43	1.00	0.29	0.00	0.29
69.55	0.42	0.43	0.99*	0.28	0.00	0.28
69.60	0.41	0.43	0.97*	0.28	0.00	0.28
69.65	0.41	0.43	0.96*	0.28	0.00	0.28
69.70	0.40	0.43	0.94*	0.27	0.00	0.27
69.75	0.40	0.43	0.93*	0.27	0.00	0.27
69.80	0.39	0.43	0.92*	0.27	0.00	0.27
69.85	0.39	0.42	0.91*	0.26	0.00	0.26
69.90	0.38	0.42	0.90*	0.26	0.00	0.26
69.95	0.38	0.42	0.89*	0.25	0.00	0.25
70.00	0.37	0.42	0.88*	0.25	0.00	0.25
70.05	0.37	0.42	0.87*	0.25	0.00	0.25
70.10	0.36	0.42	0.86*	0.24	0.00	0.24
70.15	0.36	0.42	0.85*	0.24	0.00	0.24
70.20	0.36	0.42	0.85*	0.23	0.00	0.23
70.25	0.35	0.42	0.84*	0.23	0.00	0.23
70.30	0.35	0.42	0.83*	0.22	0.00	0.22
70.35	0.35	0.42	0.83*	0.22	0.00	0.22
70.40	0.35	0.42	0.83*	0.21	0.00	0.21
70.45	0.35	0.42	0.83*	0.21	0.00	0.21
70.50	0.35	0.42	0.83*	0.21	0.00	0.21
70.55	0.35	0.42	0.83*	0.20	0.00	0.20
70.60	0.35	0.42	0.84*	0.20	0.00	0.20
70.65	0.36	0.42	0.85*	0.19	0.00	0.19
70.70	0.36	0.42	0.86*	0.19	0.00	0.19
70.75	0.36	0.42	0.87*	0.18	0.00	0.18
70.80	0.37	0.42	0.88*	0.18	0.00	0.18
70.85	0.37	0.42	0.89*	0.18	0.00	0.18
70.90	0.38	0.42	0.91*	0.17	0.00	0.17
70.95	0.39	0.42	0.92*	0.17	0.00	0.17
71.00	0.39	0.42	0.94*	0.16	0.00	0.16
71.05	0.40	0.42	0.95*	0.16	0.00	0.16
71.10	0.41	0.42	0.97*	0.16	0.00	0.16
71.15	0.41	0.42	0.99*	0.15	0.00	0.15
71.20	0.42	0.42	1.01	0.15	0.00	0.15
71.25	0.43	0.42	1.03	0.15	0.00	0.15
71.30	0.44	0.42	1.05	0.15	0.00	0.15
71.35	0.44	0.42	1.07	0.14	0.00	0.14
71.40	0.45	0.42	1.09	0.14	0.00	0.14
71.45	0.46	0.42	1.11	0.14	0.00	0.14
71.50	0.47	0.42	1.13	0.14	0.00	0.14
71.55	0.47	0.41	1.13	0.14	0.00	0.14
71.60	0.47	0.41	1.12	0.13	0.00	0.13
71.65	0.46	0.41	1.12	0.13	0.00	0.13
71.70	0.46	0.41	1.11	0.13	0.00	0.13
71.75	0.46	0.41	1.11	0.13	0.00	0.13
71.80	0.46	0.41	1.10	0.13	0.00	0.13
71.85	0.45	0.41	1.10	0.13	0.00	0.13
71.90	0.45	0.41	1.10	0.12	0.00	0.12
71.95	0.45	0.41	1.09	0.12	0.00	0.12
72.00	0.45	0.41	1.09	0.12	0.00	0.12
72.05	0.45	0.41	1.08	0.12	0.00	0.12
72.10	0.44	0.41	1.08	0.11	0.00	0.11
72.15	0.44	0.41	1.08	0.11	0.00	0.11
72.20	0.44	0.41	1.07	0.11	0.00	0.11
72.25	0.44	0.41	1.07	0.11	0.00	0.11
72.30	0.44	0.41	1.06	0.11	0.00	0.11
72.35	0.43	0.41	1.06	0.10	0.00	0.10
72.40	0.43	0.41	1.05	0.10	0.00	0.10
72.45	0.43	0.41	1.05	0.10	0.00	0.10
72.50	0.43	0.41	1.05	0.10	0.00	0.10
72.55	0.45	0.41	1.09	0.09	0.00	0.09
72.60	0.46	0.41	1.13	0.09	0.00	0.09
72.65	0.48	0.41	1.17	0.09	0.00	0.09
72.70	0.50	0.41	1.22	0.09	0.00	0.09
72.75	0.51	0.41	1.26	0.09	0.00	0.09
72.80	0.53	0.41	1.30	0.09	0.00	0.09
72.85	0.55	0.41	1.35	0.09	0.00	0.09
72.90	0.57	0.41	1.39	0.09	0.00	0.09
72.95	0.59	0.41	1.44	0.09	0.00	0.09
73.00	0.61	0.41	1.49	0.09	0.00	0.09
73.05	0.62	0.41	1.54	0.09	0.00	0.09
73.10	0.64	0.41	1.59	0.09	0.00	0.09
73.15	0.67	0.41	1.64	0.09	0.00	0.09
73.20	0.69	0.40	1.69	0.09	0.00	0.09
73.25	0.71	0.40	1.75	0.09	0.00	0.09
73.30	0.73	0.40	1.80	0.09	0.00	0.09
73.35	0.75	0.40	1.86	0.09	0.00	0.09
73.40	0.77	0.40	1.92	0.09	0.00	0.09
73.45	0.80	0.40	1.97	0.09	0.00	0.09
73.50	0.81	0.40	2.02	0.09	0.00	0.09
73.55	0.81	0.40	2.01	0.09	0.00	0.09
73.60	0.81	0.40	2.00	0.09	0.00	0.09
73.65	0.80	0.40	1.99	0.09	0.00	0.09
73.70	0.80	0.40	1.99	0.09	0.00	0.09
73.75	0.79	0.40	1.98	0.09	0.00	0.09
73.80	0.79	0.40	1.97	0.09	0.00	0.09
73.85	0.79	0.40	1.96	0.09	0.00	0.09
73.90	0.78	0.40	1.95	0.09	0.00	0.09
73.95	0.78	0.40	1.95	0.09	0.00	0.09
74.00	0.78	0.40	1.94	0.09	0.00	0.09
74.05	0.77	0.40	1.93	0.09	0.00	0.09
74.10	0.77	0.40	1.92	0.09	0.00	0.09
74.15	0.77	0.40	1.92	0.09	0.00	0.09
74.20	0.76	0.40	1.91	0.09	0.00	0.09
74.25	0.76	0.40	1.90	0.09	0.00	0.09
74.30	0.75	0.40	1.89	0.09	0.00	0.09
74.35	0.75	0.40	1.89	0.09	0.00	0.09
74.40	0.75	0.40	1.88	0.09	0.00	0.09
74.45	0.74	0.40	1.87	0.09	0.00	0.09
74.50	0.74	0.40	1.85	0.09	0.00	0.09
74.55	0.70	0.40	1.76	0.09	0.00	0.09
74.60	0.66	0.40	1.67	0.09	0.00	0.09
74.65	0.63	0.40	1.59	0.09	0.00	0.09
74.70	0.60	0.40	1.50	0.09	0.00	0.09
74.75	0.56	0.40	1.43	0.09	0.00	0.09
74.80	0.53	0.40	1.35	0.08	0.00	0.08
74.85	0.51	0.40	1.28	0.08	0.00	0.08
74.90	0.48	0.39	1.21	0.08	0.00	0.08
74.95	0.45	0.39	1.14	0.08	0.00	0.08
75.00	0.43	0.39	1.08	0.08	0.00	0.08
75.05	0.40	0.39	1.02	0.07	0.00	0.07
75.10	0.38	0.39	0.96*	0.07	0.00	0.07
75.15	0.36	0.39	0.91*	0.07	0.00	0.07
75.20	0.34	0.39	0.86*	0.06	0.00	0.06
75.25	0.32	0.39	0.81*	0.05	0.00	0.05
75.30	0.30	0.39	0.76*	0.05	0.00	0.05
75.35	0.28	0.39	0.72*	0.04	0.00	0.04
75.40	0.27	0.39	0.68*	0.03	0.00	0.03
75.45	0.25	0.39	0.64*	0.01	0.00	0.01
75.50	2.00	0.39	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units Depth = ft, Stress or Pressure = tsf (atm), Unit Weight = pcf, Settlement = in.

CRRm	Cyclic resistance ratio from soils
CSRfs	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRfs
S_sat	Settlement from saturated sands
S_dry	Settlement from dry sands
S_all	Total settlement from saturated and dry sands
NoLiq	No-Liquefy Soils

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Input File Name: E:\VB&B\Woodfin\CPT-2.liq
Title: Woodfin Suites
Subtitle: 04-012.3

Surface Elev.=12
Hole No.=CPT-2
Depth of Hole= 75.5 ft
Water Table during Earthquake= 7.0 ft
Water Table during In-Situ Testing= 12.0 ft
Max. Acceleration= 0.5 g
Earthquake Magnitude= 7.1

Input Data:

Surface Elev.=12
Hole No.=CPT-2
Depth of Hole=75.5 ft
Water Table during Earthquake= 7.0 ft
Water Table during In-Situ Testing= 12.0 ft
Max. Acceleration=0.5 g
Earthquake Magnitude=7.1

1. CPT Calulation Method: Modify Robertson*
2. Settlement Analysis Method: Ishihara / Yoshimine*
3. Fines Correction for Liquefaction: Idriss/Seed (SPT only)
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1
7. Borehole Diameter, Cb= 1
8. Sampeling Method, Cs= 1
9. User request factor of safty (apply to CSR) , User= 1
   Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	qc tsf	fs tsf	gamma pcf	Fines %	D50 mm
0.0	178.6	0.7	100.0	NoLiq	0.5
1.5	286.8	1.5	100.0	NoLiq	0.5
2.5	246.4	1.2	100.0	NoLiq	0.5
3.5	208.7	0.9	100.0	NoLiq	0.5
4.5	177.9	0.7	100.0	NoLiq	0.5
5.5	155.8	0.7	100.0	NoLiq	0.5
6.5	131.6	0.5	100.0	NoLiq	0.5
7.5	128.4	0.5	100.0	NoLiq	0.5
8.5	110.9	0.6	100.0	NoLiq	0.5
9.5	50.6	0.5	100.0	NoLiq	0.5
10.5	62.6	1.1	100.0	NoLiq	0.5
11.5	35.5	0.8	100.0	NoLiq	0.5
12.5	14.3	0.2	120.0	NoLiq	0.5
13.5	6.9	0.1	120.0	NoLiq	0.5
14.5	15.2	0.2	110.0	10.0	0.2
15.5	18.9	0.1	110.0	10.0	0.2
16.5	43.4	0.2	110.0	10.0	0.2
17.5	80.4	0.4	110.0	10.0	0.2
18.5	45.4	0.3	110.0	10.0	0.2
19.5	17.1	0.1	110.0	10.0	0.2
20.5	47.8	0.2	110.0	10.0	0.2
21.5	55.9	0.3	110.0	10.0	0.2
22.5	34.2	0.2	110.0	10.0	0.2
23.5	55.5	0.4	110.0	10.0	0.2
24.5	102.2	0.7	110.0	10.0	0.2
25.5	113.7	0.9	110.0	10.0	0.2
26.5	156.1	0.9	110.0	10.0	0.2
27.5	192.8	1.0	110.0	10.0	0.2
28.5	126.2	0.9	110.0	10.0	0.2
29.5	20.2	0.3	110.0	10.0	0.2
30.5	6.4	0.2	120.0	NoLiq	0.2
31.5	6.4	0.2	120.0	NoLiq	0.2
32.5	6.4	0.1	120.0	NoLiq	0.2
33.5	7.0	0.2	120.0	NoLiq	0.2
34.5	6.6	0.2	120.0	NoLiq	0.2
35.5	15.1	0.3	120.0	NoLiq	0.2
36.5	30.5	0.3	110.0	48.0	0.1
37.5	53.4	0.3	110.0	48.0	0.1
38.5	30.0	0.2	110.0	48.0	0.1
39.5	9.3	0.2	120.0	NoLiq	0.1
40.5	11.9	0.2	120.0	NoLiq	0.1
41.5	9.4	0.2	120.0	NoLiq	0.1
42.5	17.8	0.5	120.0	NoLiq	0.1
43.5	24.7	1.0	120.0	NoLiq	0.1
44.5	23.4	1.0	120.0	NoLiq	0.1
45.5	14.8	0.4	120.0	NoLiq	0.1
46.5	21.6	0.6	120.0	NoLiq	0.1
47.5	26.9	1.1	120.0	NoLiq	0.1
48.5	142.3	1.4	120.0	NoLiq	1.1
49.5	215.9	0.8	120.0	10.0	1.1
50.5	246.4	1.5	120.0	10.0	1.1
51.5	336.3	2.1	120.0	10.0	1.1
52.5	511.6	2.4	120.0	10.0	1.1
53.5	445.7	2.1	120.0	10.0	1.1
54.5	452.0	1.9	120.0	10.0	1.1
55.5	286.0	1.3	120.0	10.0	1.1
56.5	253.6	1.1	120.0	10.0	1.1
57.5	213.0	0.9	120.0	10.0	1.1
58.5	280.1	2.5	120.0	10.0	1.1
59.5	302.9	2.1	120.0	10.0	1.1
60.5	257.8	1.8	120.0	10.0	1.1
61.5	252.5	1.7	120.0	10.0	1.1
62.5	258.9	1.6	120.0	10.0	1.1
63.5	215.9	2.4	120.0	10.0	1.1
64.5	203.2	1.9	120.0	10.0	1.1
65.5	78.1	1.8	120.0	16.0	0.5
66.5	114.7	2.4	120.0	16.0	0.5
67.5	229.7	2.1	120.0	10.0	0.1
68.5	275.8	2.3	120.0	10.0	0.1
69.5	313.2	2.0	120.0	10.0	0.1
70.5	322.3	1.7	120.0	10.0	0.1
71.5	300.3	1.9	120.0	10.0	0.1
72.5	317.6	1.5	120.0	45.0	0.1
73.5	192.3	1.2	120.0	45.0	0.1
74.5	89.9	0.9	120.0	45.0	0.1
75.5	113.0	0.0	120.0	45.0	0.1

Output Results:

Settlement of saturated sands=5.98 in.
Settlement of dry sands=0.00 in.
Total settlement of saturated and dry sands=5.98 in.
Differential Settlement=2.992 to 3.949 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.00	0.32	5.00	5.98	0.00	5.98
0.05	2.00	0.32	5.00	5.98	0.00	5.98
0.10	2.00	0.32	5.00	5.98	0.00	5.98
0.15	2.00	0.32	5.00	5.98	0.00	5.98
0.20	2.00	0.32	5.00	5.98	0.00	5.98
0.25	2.00	0.32	5.00	5.98	0.00	5.98
0.30	2.00	0.32	5.00	5.98	0.00	5.98
0.35	2.00	0.32	5.00	5.98	0.00	5.98
0.40	2.00	0.32	5.00	5.98	0.00	5.98
0.45	2.00	0.32	5.00	5.98	0.00	5.98
0.50	2.00	0.32	5.00	5.98	0.00	5.98
0.55	2.00	0.32	5.00	5.98	0.00	5.98
0.60	2.00	0.32	5.00	5.98	0.00	5.98
0.65	2.00	0.32	5.00	5.98	0.00	5.98
0.70	2.00	0.32	5.00	5.98	0.00	5.98
0.75	2.00	0.32	5.00	5.98	0.00	5.98
0.80	2.00	0.32	5.00	5.98	0.00	5.98
0.85	2.00	0.32	5.00	5.98	0.00	5.98
0.90	2.00	0.32	5.00	5.98	0.00	5.98
0.95	2.00	0.32	5.00	5.98	0.00	5.98
1.00	2.00	0.32	5.00	5.98	0.00	5.98
1.05	2.00	0.32	5.00	5.98	0.00	5.98
1.10	2.00	0.32	5.00	5.98	0.00	5.98
1.15	2.00	0.32	5.00	5.98	0.00	5.98
1.20	2.00	0.32	5.00	5.98	0.00	5.98
1.25	2.00	0.32	5.00	5.98	0.00	5.98
1.30	2.00	0.32	5.00	5.98	0.00	5.98
1.35	2.00	0.32	5.00	5.98	0.00	5.98
1.40	2.00	0.32	5.00	5.98	0.00	5.98
1.45	2.00	0.32	5.00	5.98	0.00	5.98
1.50	2.00	0.32	5.00	5.98	0.00	5.98
1.55	2.00	0.32	5.00	5.98	0.00	5.98
1.60	2.00	0.32	5.00	5.98	0.00	5.98
1.65	2.00	0.32	5.00	5.98	0.00	5.98
1.70	2.00	0.32	5.00	5.98	0.00	5.98
1.75	2.00	0.32	5.00	5.98	0.00	5.98
1.80	2.00	0.32	5.00	5.98	0.00	5.98
1.85	2.00	0.32	5.00	5.98	0.00	5.98
1.90	2.00	0.32	5.00	5.98	0.00	5.98
1.95	2.00	0.32	5.00	5.98	0.00	5.98
2.00	2.00	0.32	5.00	5.98	0.00	5.98
2.05	2.00	0.32	5.00	5.98	0.00	5.98
2.10	2.00	0.32	5.00	5.98	0.00	5.98
2.15	2.00	0.32	5.00	5.98	0.00	5.98
2.20	2.00	0.32	5.00	5.98	0.00	5.98
2.25	2.00	0.32	5.00	5.98	0.00	5.98
2.30	2.00	0.32	5.00	5.98	0.00	5.98
2.35	2.00	0.32	5.00	5.98	0.00	5.98
2.40	2.00	0.32	5.00	5.98	0.00	5.98
2.45	2.00	0.32	5.00	5.98	0.00	5.98
2.50	2.00	0.32	5.00	5.98	0.00	5.98
2.55	2.00	0.32	5.00	5.98	0.00	5.98
2.60	2.00	0.32	5.00	5.98	0.00	5.98
2.65	2.00	0.32	5.00	5.98	0.00	5.98
2.70	2.00	0.32	5.00	5.98	0.00	5.98
2.75	2.00	0.32	5.00	5.98	0.00	5.98
2.80	2.00	0.32	5.00	5.98	0.00	5.98
2.85	2.00	0.32	5.00	5.98	0.00	5.98
2.90	2.00	0.32	5.00	5.98	0.00	5.98
2.95	2.00	0.32	5.00	5.98	0.00	5.98
3.00	2.00	0.32	5.00	5.98	0.00	5.98
3.05	2.00	0.32	5.00	5.98	0.00	5.98
3.10	2.00	0.32	5.00	5.98	0.00	5.98
3.15	2.00	0.32	5.00	5.98	0.00	5.98
3.20	2.00	0.32	5.00	5.98	0.00	5.98
3.25	2.00	0.32	5.00	5.98	0.00	5.98
3.30	2.00	0.32	5.00	5.98	0.00	5.98
3.35	2.00	0.32	5.00	5.98	0.00	5.98
3.40	2.00	0.32	5.00	5.98	0.00	5.98
3.45	2.00	0.32	5.00	5.98	0.00	5.98
3.50	2.00	0.32	5.00	5.98	0.00	5.98
3.55	2.00	0.32	5.00	5.98	0.00	5.98
3.60	2.00	0.32	5.00	5.98	0.00	5.98
3.65	2.00	0.32	5.00	5.98	0.00	5.98
3.70	2.00	0.32	5.00	5.98	0.00	5.98
3.75	2.00	0.32	5.00	5.98	0.00	5.98
3.80	2.00	0.32	5.00	5.98	0.00	5.98
3.85	2.00	0.32	5.00	5.98	0.00	5.98
3.90	2.00	0.32	5.00	5.98	0.00	5.98
3.95	2.00	0.32	5.00	5.98	0.00	5.98
4.00	2.00	0.32	5.00	5.98	0.00	5.98
4.05	2.00	0.32	5.00	5.98	0.00	5.98
4.10	2.00	0.32	5.00	5.98	0.00	5.98
4.15	2.00	0.32	5.00	5.98	0.00	5.98
4.20	2.00	0.32	5.00	5.98	0.00	5.98
4.25	2.00	0.32	5.00	5.98	0.00	5.98
4.30	2.00	0.32	5.00	5.98	0.00	5.98
4.35	2.00	0.32	5.00	5.98	0.00	5.98
4.40	2.00	0.32	5.00	5.98	0.00	5.98
4.45	2.00	0.32	5.00	5.98	0.00	5.98
4.50	2.00	0.32	5.00	5.98	0.00	5.98
4.55	2.00	0.32	5.00	5.98	0.00	5.98
4.60	2.00	0.32	5.00	5.98	0.00	5.98
4.65	2.00	0.32	5.00	5.98	0.00	5.98
4.70	2.00	0.32	5.00	5.98	0.00	5.98
4.75	2.00	0.32	5.00	5.98	0.00	5.98
4.80	2.00	0.32	5.00	5.98	0.00	5.98
4.85	2.00	0.32	5.00	5.98	0.00	5.98
4.90	2.00	0.32	5.00	5.98	0.00	5.98
4.95	2.00	0.32	5.00	5.98	0.00	5.98
5.00	2.00	0.32	5.00	5.98	0.00	5.98
5.05	2.00	0.32	5.00	5.98	0.00	5.98
5.10	2.00	0.32	5.00	5.98	0.00	5.98
5.15	2.00	0.32	5.00	5.98	0.00	5.98
5.20	2.00	0.32	5.00	5.98	0.00	5.98
5.25	2.00	0.32	5.00	5.98	0.00	5.98
5.30	2.00	0.32	5.00	5.98	0.00	5.98
5.35	2.00	0.32	5.00	5.98	0.00	5.98
5.40	2.00	0.32	5.00	5.98	0.00	5.98
5.45	2.00	0.32	5.00	5.98	0.00	5.98
5.50	2.00	0.32	5.00	5.98	0.00	5.98
5.55	2.00	0.32	5.00	5.98	0.00	5.98
5.60	2.00	0.32	5.00	5.98	0.00	5.98
5.65	2.00	0.32	5.00	5.98	0.00	5.98
5.70	2.00	0.32	5.00	5.98	0.00	5.98
5.75	2.00	0.32	5.00	5.98	0.00	5.98
5.80	2.00	0.32	5.00	5.98	0.00	5.98
5.85	2.00	0.32	5.00	5.98	0.00	5.98
5.90	2.00	0.32	5.00	5.98	0.00	5.98
5.95	2.00	0.32	5.00	5.98	0.00	5.98
6.00	2.00	0.32	5.00	5.98	0.00	5.98
6.05	2.00	0.32	5.00	5.98	0.00	5.98
6.10	2.00	0.32	5.00	5.98	0.00	5.98
6.15	2.00	0.32	5.00	5.98	0.00	5.98
6.20	2.00	0.32	5.00	5.98	0.00	5.98
6.25	2.00	0.32	5.00	5.98	0.00	5.98
6.30	2.00	0.32	5.00	5.98	0.00	5.98
6.35	2.00	0.32	5.00	5.98	0.00	5.98
6.40	2.00	0.32	5.00	5.98	0.00	5.98
6.45	2.00	0.32	5.00	5.98	0.00	5.98
6.50	2.00	0.32	5.00	5.98	0.00	5.98
6.55	2.00	0.32	5.00	5.98	0.00	5.98
6.60	2.00	0.32	5.00	5.98	0.00	5.98
6.65	2.00	0.32	5.00	5.98	0.00	5.98
6.70	2.00	0.32	5.00	5.98	0.00	5.98

6.75	2.00	0.32	5.00	5.98	0.00	5.98
6.80	2.00	0.32	5.00	5.98	0.00	5.98
6.85	2.00	0.32	5.00	5.98	0.00	5.98
6.90	2.00	0.32	5.00	5.98	0.00	5.98
6.95	2.00	0.32	5.00	5.98	0.00	5.98
7.00	2.00	0.32	5.00	5.98	0.00	5.98
7.05	2.00	0.32	5.00	5.98	0.00	5.98
7.10	2.00	0.32	5.00	5.98	0.00	5.98
7.15	2.00	0.32	5.00	5.98	0.00	5.98
7.20	2.00	0.33	5.00	5.98	0.00	5.98
7.25	2.00	0.33	5.00	5.98	0.00	5.98
7.30	2.00	0.33	5.00	5.98	0.00	5.98
7.35	2.00	0.33	5.00	5.98	0.00	5.98
7.40	2.00	0.33	5.00	5.98	0.00	5.98
7.45	2.00	0.33	5.00	5.98	0.00	5.98
7.50	2.00	0.33	5.00	5.98	0.00	5.98
7.55	2.00	0.33	5.00	5.98	0.00	5.98
7.60	2.00	0.34	5.00	5.98	0.00	5.98
7.65	2.00	0.34	5.00	5.98	0.00	5.98
7.70	2.00	0.34	5.00	5.98	0.00	5.98
7.75	2.00	0.34	5.00	5.98	0.00	5.98
7.80	2.00	0.34	5.00	5.98	0.00	5.98
7.85	2.00	0.34	5.00	5.98	0.00	5.98
7.90	2.00	0.34	5.00	5.98	0.00	5.98
7.95	2.00	0.34	5.00	5.98	0.00	5.98
8.00	2.00	0.35	5.00	5.98	0.00	5.98
8.05	2.00	0.35	5.00	5.98	0.00	5.98
8.10	2.00	0.35	5.00	5.98	0.00	5.98
8.15	2.00	0.35	5.00	5.98	0.00	5.98
8.20	2.00	0.35	5.00	5.98	0.00	5.98
8.25	2.00	0.35	5.00	5.98	0.00	5.98
8.30	2.00	0.35	5.00	5.98	0.00	5.98
8.35	2.00	0.35	5.00	5.98	0.00	5.98
8.40	2.00	0.36	5.00	5.98	0.00	5.98
8.45	2.00	0.36	5.00	5.98	0.00	5.98
8.50	2.00	0.36	5.00	5.98	0.00	5.98
8.55	2.00	0.36	5.00	5.98	0.00	5.98
8.60	2.00	0.36	5.00	5.98	0.00	5.98
8.65	2.00	0.36	5.00	5.98	0.00	5.98
8.70	2.00	0.36	5.00	5.98	0.00	5.98
8.75	2.00	0.36	5.00	5.98	0.00	5.98
8.80	2.00	0.36	5.00	5.98	0.00	5.98
8.85	2.00	0.37	5.00	5.98	0.00	5.98
8.90	2.00	0.37	5.00	5.98	0.00	5.98
8.95	2.00	0.37	5.00	5.98	0.00	5.98
9.00	2.00	0.37	5.00	5.98	0.00	5.98
9.05	2.00	0.37	5.00	5.98	0.00	5.98
9.10	2.00	0.37	5.00	5.98	0.00	5.98
9.15	2.00	0.37	5.00	5.98	0.00	5.98
9.20	2.00	0.37	5.00	5.98	0.00	5.98
9.25	2.00	0.37	5.00	5.98	0.00	5.98
9.30	2.00	0.38	5.00	5.98	0.00	5.98
9.35	2.00	0.38	5.00	5.98	0.00	5.98
9.40	2.00	0.38	5.00	5.98	0.00	5.98
9.45	2.00	0.38	5.00	5.98	0.00	5.98
9.50	2.00	0.38	5.00	5.98	0.00	5.98
9.55	2.00	0.38	5.00	5.98	0.00	5.98
9.60	2.00	0.38	5.00	5.98	0.00	5.98
9.65	2.00	0.38	5.00	5.98	0.00	5.98
9.70	2.00	0.38	5.00	5.98	0.00	5.98
9.75	2.00	0.39	5.00	5.98	0.00	5.98
9.80	2.00	0.39	5.00	5.98	0.00	5.98
9.85	2.00	0.39	5.00	5.98	0.00	5.98
9.90	2.00	0.39	5.00	5.98	0.00	5.98
9.95	2.00	0.39	5.00	5.98	0.00	5.98
10.00	2.00	0.39	5.00	5.98	0.00	5.98
10.05	2.00	0.39	5.00	5.98	0.00	5.98
10.10	2.00	0.39	5.00	5.98	0.00	5.98
10.15	2.00	0.39	5.00	5.98	0.00	5.98
10.20	2.00	0.39	5.00	5.98	0.00	5.98
10.25	2.00	0.40	5.00	5.98	0.00	5.98
10.30	2.00	0.40	5.00	5.98	0.00	5.98
10.35	2.00	0.40	5.00	5.98	0.00	5.98
10.40	2.00	0.40	5.00	5.98	0.00	5.98
10.45	2.00	0.40	5.00	5.98	0.00	5.98
10.50	2.00	0.40	5.00	5.98	0.00	5.98
10.55	2.00	0.40	5.00	5.98	0.00	5.98
10.60	2.00	0.40	5.00	5.98	0.00	5.98
10.65	2.00	0.40	5.00	5.98	0.00	5.98
10.70	2.00	0.40	5.00	5.98	0.00	5.98
10.75	2.00	0.41	5.00	5.98	0.00	5.98
10.80	2.00	0.41	5.00	5.98	0.00	5.98
10.85	2.00	0.41	5.00	5.98	0.00	5.98
10.90	2.00	0.41	5.00	5.98	0.00	5.98
10.95	2.00	0.41	5.00	5.98	0.00	5.98
11.00	2.00	0.41	5.00	5.98	0.00	5.98
11.05	2.00	0.41	5.00	5.98	0.00	5.98
11.10	2.00	0.41	5.00	5.98	0.00	5.98
11.15	2.00	0.41	5.00	5.98	0.00	5.98
11.20	2.00	0.41	5.00	5.98	0.00	5.98
11.25	2.00	0.41	5.00	5.98	0.00	5.98
11.30	2.00	0.41	5.00	5.98	0.00	5.98
11.35	2.00	0.42	5.00	5.98	0.00	5.98
11.40	2.00	0.42	5.00	5.98	0.00	5.98
11.45	2.00	0.42	5.00	5.98	0.00	5.98
11.50	2.00	0.42	5.00	5.98	0.00	5.98
11.55	2.00	0.42	5.00	5.98	0.00	5.98
11.60	2.00	0.42	5.00	5.98	0.00	5.98
11.65	2.00	0.42	5.00	5.98	0.00	5.98
11.70	2.00	0.42	5.00	5.98	0.00	5.98
11.75	2.00	0.42	5.00	5.98	0.00	5.98
11.80	2.00	0.42	5.00	5.98	0.00	5.98
11.85	2.00	0.42	5.00	5.98	0.00	5.98
11.90	2.00	0.43	5.00	5.98	0.00	5.98
11.95	2.00	0.43	5.00	5.98	0.00	5.98
12.00	2.00	0.43	5.00	5.98	0.00	5.98
12.05	2.00	0.43	5.00	5.98	0.00	5.98
12.10	2.00	0.43	5.00	5.98	0.00	5.98
12.15	2.00	0.43	5.00	5.98	0.00	5.98
12.20	2.00	0.43	5.00	5.98	0.00	5.98
12.25	2.00	0.43	5.00	5.98	0.00	5.98
12.30	2.00	0.43	5.00	5.98	0.00	5.98
12.35	2.00	0.43	5.00	5.98	0.00	5.98
12.40	2.00	0.43	5.00	5.98	0.00	5.98
12.45	2.00	0.43	5.00	5.98	0.00	5.98
12.50	2.00	0.43	5.00	5.98	0.00	5.98
12.55	2.00	0.43	5.00	5.98	0.00	5.98
12.60	2.00	0.43	5.00	5.98	0.00	5.98
12.65	2.00	0.44	5.00	5.98	0.00	5.98
12.70	2.00	0.44	5.00	5.98	0.00	5.98
12.75	2.00	0.44	5.00	5.98	0.00	5.98
12.80	2.00	0.44	5.00	5.98	0.00	5.98
12.85	2.00	0.44	5.00	5.98	0.00	5.98
12.90	2.00	0.44	5.00	5.98	0.00	5.98
12.95	2.00	0.44	5.00	5.98	0.00	5.98
13.00	2.00	0.44	5.00	5.98	0.00	5.98
13.05	2.00	0.44	5.00	5.98	0.00	5.98
13.10	2.00	0.44	5.00	5.98	0.00	5.98
13.15	2.00	0.44	5.00	5.98	0.00	5.98
13.20	2.00	0.44	5.00	5.98	0.00	5.98
13.25	2.00	0.44	5.00	5.98	0.00	5.98
13.30	2.00	0.44	5.00	5.98	0.00	5.98
13.35	2.00	0.44	5.00	5.98	0.00	5.98
13.40	2.00	0.44	5.00	5.98	0.00	5.98
13.45	2.00	0.45	5.00	5.98	0.00	5.98
13.50	2.00	0.45	5.00	5.98	0.00	5.98
13.55	2.00	0.45	5.00	5.98	0.00	5.98
13.60	2.00	0.45	5.00	5.98	0.00	5.98

13.65	2.00	0.45	5.00	5.98	0.00	5.98
13.70	2.00	0.45	5.00	5.98	0.00	5.98
13.75	2.00	0.45	5.00	5.98	0.00	5.98
13.80	2.00	0.45	5.00	5.98	0.00	5.98
13.85	2.00	0.45	5.00	5.98	0.00	5.98
13.90	2.00	0.45	5.00	5.98	0.00	5.98
13.95	2.00	0.45	5.00	5.98	0.00	5.98
14.00	2.00	0.45	5.00	5.98	0.00	5.98
14.05	2.00	0.45	5.00	5.98	0.00	5.98
14.10	2.00	0.45	5.00	5.98	0.00	5.98
14.15	2.00	0.45	5.00	5.98	0.00	5.98
14.20	2.00	0.45	5.00	5.98	0.00	5.98
14.25	2.00	0.45	5.00	5.98	0.00	5.98
14.30	2.00	0.45	5.00	5.98	0.00	5.98
14.35	2.00	0.46	5.00	5.98	0.00	5.98
14.40	2.00	0.46	5.00	5.98	0.00	5.98
14.45	2.00	0.46	5.00	5.98	0.00	5.98
14.50	0.14	0.46	0.30*	5.98	0.00	5.98
14.55	0.13	0.46	0.29*	5.97	0.00	5.97
14.60	0.13	0.46	0.28*	5.96	0.00	5.96
14.65	0.12	0.46	0.27*	5.94	0.00	5.94
14.70	0.12	0.46	0.26*	5.93	0.00	5.93
14.75	0.12	0.46	0.25*	5.91	0.00	5.91
14.80	0.11	0.46	0.25*	5.90	0.00	5.90
14.85	0.11	0.46	0.24*	5.88	0.00	5.88
14.90	0.11	0.46	0.24*	5.86	0.00	5.86
14.95	0.11	0.46	0.23*	5.85	0.00	5.85
15.00	0.11	0.46	0.23*	5.83	0.00	5.83
15.05	0.11	0.46	0.23*	5.81	0.00	5.81
15.10	0.11	0.46	0.23*	5.79	0.00	5.79
15.15	0.10	0.46	0.22*	5.77	0.00	5.77
15.20	0.10	0.46	0.22*	5.75	0.00	5.75
15.25	0.10	0.47	0.22*	5.74	0.00	5.74
15.30	0.10	0.47	0.22*	5.72	0.00	5.72
15.35	0.10	0.47	0.22*	5.70	0.00	5.70
15.40	0.10	0.47	0.21*	5.68	0.00	5.68
15.45	0.10	0.47	0.21*	5.65	0.00	5.65
15.50	0.10	0.47	0.21*	5.63	0.00	5.63
15.55	0.10	0.47	0.21*	5.61	0.00	5.61
15.60	0.10	0.47	0.21*	5.59	0.00	5.59
15.65	0.10	0.47	0.21*	5.57	0.00	5.57
15.70	0.10	0.47	0.22*	5.55	0.00	5.55
15.75	0.10	0.47	0.22*	5.53	0.00	5.53
15.80	0.10	0.47	0.22*	5.51	0.00	5.51
15.85	0.10	0.47	0.22*	5.49	0.00	5.49
15.90	0.11	0.47	0.22*	5.47	0.00	5.47
15.95	0.11	0.47	0.23*	5.45	0.00	5.45
16.00	0.11	0.47	0.23*	5.43	0.00	5.43
16.05	0.11	0.47	0.23*	5.41	0.00	5.41
16.10	0.11	0.47	0.23*	5.39	0.00	5.39
16.15	0.11	0.47	0.23*	5.37	0.00	5.37
16.20	0.11	0.47	0.24*	5.35	0.00	5.35
16.25	0.11	0.48	0.24*	5.34	0.00	5.34
16.30	0.11	0.48	0.24*	5.32	0.00	5.32
16.35	0.12	0.48	0.24*	5.30	0.00	5.30
16.40	0.12	0.48	0.25*	5.28	0.00	5.28
16.45	0.12	0.48	0.25*	5.26	0.00	5.26
16.50	0.12	0.48	0.25*	5.24	0.00	5.24
16.55	0.12	0.48	0.26*	5.23	0.00	5.23
16.60	0.13	0.48	0.26*	5.21	0.00	5.21
16.65	0.13	0.48	0.27*	5.19	0.00	5.19
16.70	0.13	0.48	0.27*	5.17	0.00	5.17
16.75	0.13	0.48	0.28*	5.16	0.00	5.16
16.80	0.14	0.48	0.29*	5.14	0.00	5.14
16.85	0.14	0.48	0.29*	5.13	0.00	5.13
16.90	0.15	0.48	0.30*	5.11	0.00	5.11
16.95	0.15	0.48	0.31*	5.09	0.00	5.09
17.00	0.15	0.48	0.32*	5.08	0.00	5.08
17.05	0.16	0.48	0.33*	5.06	0.00	5.06
17.10	0.16	0.48	0.33*	5.05	0.00	5.05
17.15	0.17	0.48	0.34*	5.03	0.00	5.03
17.20	0.17	0.48	0.35*	5.02	0.00	5.02
17.25	0.17	0.48	0.36*	5.00	0.00	5.00
17.30	0.18	0.48	0.37*	4.99	0.00	4.99
17.35	0.19	0.49	0.38*	4.97	0.00	4.97
17.40	0.19	0.49	0.39*	4.96	0.00	4.96
17.45	0.20	0.49	0.40*	4.95	0.00	4.95
17.50	0.20	0.49	0.41*	4.93	0.00	4.93
17.55	0.20	0.49	0.40*	4.92	0.00	4.92
17.60	0.19	0.49	0.39*	4.91	0.00	4.91
17.65	0.19	0.49	0.38*	4.89	0.00	4.89
17.70	0.18	0.49	0.37*	4.88	0.00	4.88
17.75	0.18	0.49	0.36*	4.86	0.00	4.86
17.80	0.17	0.49	0.35*	4.85	0.00	4.85
17.85	0.17	0.49	0.34*	4.84	0.00	4.84
17.90	0.16	0.49	0.33*	4.82	0.00	4.82
17.95	0.16	0.49	0.32*	4.81	0.00	4.81
18.00	0.16	0.49	0.32*	4.79	0.00	4.79
18.05	0.15	0.49	0.31*	4.78	0.00	4.78
18.10	0.15	0.49	0.30*	4.76	0.00	4.76
18.15	0.14	0.49	0.29*	4.75	0.00	4.75
18.20	0.14	0.49	0.29*	4.73	0.00	4.73
18.25	0.14	0.49	0.28*	4.71	0.00	4.71
18.30	0.14	0.49	0.28*	4.70	0.00	4.70
18.35	0.13	0.49	0.27*	4.68	0.00	4.68
18.40	0.13	0.49	0.26*	4.67	0.00	4.67
18.45	0.13	0.49	0.26*	4.65	0.00	4.65
18.50	0.13	0.49	0.25*	4.63	0.00	4.63
18.55	0.12	0.49	0.25*	4.62	0.00	4.62
18.60	0.12	0.50	0.25*	4.60	0.00	4.60
18.65	0.12	0.50	0.24*	4.58	0.00	4.58
18.70	0.12	0.50	0.24*	4.56	0.00	4.56
18.75	0.12	0.50	0.23*	4.55	0.00	4.55
18.80	0.11	0.50	0.23*	4.53	0.00	4.53
18.85	0.11	0.50	0.23*	4.51	0.00	4.51
18.90	0.11	0.50	0.22*	4.49	0.00	4.49
18.95	0.11	0.50	0.22*	4.47	0.00	4.47
19.00	0.11	0.50	0.22*	4.45	0.00	4.45
19.05	0.11	0.50	0.22*	4.44	0.00	4.44
19.10	0.11	0.50	0.21*	4.42	0.00	4.42
19.15	0.11	0.50	0.21*	4.40	0.00	4.40
19.20	0.10	0.50	0.21*	4.38	0.00	4.38
19.25	0.10	0.50	0.21*	4.36	0.00	4.36
19.30	0.10	0.50	0.20*	4.34	0.00	4.34
19.35	0.10	0.50	0.20*	4.32	0.00	4.32
19.40	0.10	0.50	0.20*	4.30	0.00	4.30
19.45	0.10	0.50	0.20*	4.28	0.00	4.28
19.50	0.10	0.50	0.20*	4.26	0.00	4.26
19.55	0.10	0.50	0.20*	4.24	0.00	4.24
19.60	0.10	0.50	0.20*	4.22	0.00	4.22
19.65	0.10	0.50	0.20*	4.20	0.00	4.20
19.70	0.10	0.50	0.20*	4.18	0.00	4.18
19.75	0.10	0.50	0.20*	4.16	0.00	4.16
19.80	0.10	0.50	0.21*	4.14	0.00	4.14
19.85	0.10	0.50	0.21*	4.12	0.00	4.12
19.90	0.11	0.50	0.21*	4.10	0.00	4.10
19.95	0.11	0.50	0.21*	4.08	0.00	4.08
20.00	0.11	0.50	0.21*	4.06	0.00	4.06
20.05	0.11	0.51	0.22*	4.04	0.00	4.04
20.10	0.11	0.51	0.22*	4.02	0.00	4.02
20.15	0.11	0.51	0.22*	4.00	0.00	4.00
20.20	0.11	0.51	0.22*	3.98	0.00	3.98
20.25	0.11	0.51	0.23*	3.96	0.00	3.96
20.30	0.12	0.51	0.23*	3.95	0.00	3.95
20.35	0.12	0.51	0.23*	3.93	0.00	3.93
20.40	0.12	0.51	0.24*	3.91	0.00	3.91
20.45	0.12	0.51	0.24*	3.89	0.00	3.89
20.50	0.12	0.51	0.24*	3.87	0.00	3.87

20.55	0.12	0.51	0.24*	3.86	0.00	3.86
20.60	0.12	0.51	0.24*	3.84	0.00	3.84
20.65	0.13	0.51	0.25*	3.82	0.00	-3.82
20.70	0.13	0.51	0.25*	3.80	0.00	3.80
20.75	0.13	0.51	0.25*	3.79	0.00	3.79
20.80	0.13	0.51	0.25*	3.77	0.00	3.77
20.85	0.13	0.51	0.25*	3.75	0.00	3.75
20.90	0.13	0.51	0.25*	3.74	0.00	3.74
20.95	0.13	0.51	0.25*	3.72	0.00	3.72
21.00	0.13	0.51	0.25*	3.70	0.00	3.70
21.05	0.13	0.51	0.26*	3.69	0.00	3.69
21.10	0.13	0.51	0.26*	3.67	0.00	3.67
21.15	0.13	0.51	0.26*	3.65	0.00	3.65
21.20	0.13	0.51	0.26*	3.64	0.00	3.64
21.25	0.13	0.51	0.26*	3.62	0.00	3.62
21.30	0.13	0.51	0.26*	3.60	0.00	3.60
21.35	0.14	0.51	0.26*	3.59	0.00	3.59
21.40	0.14	0.51	0.27*	3.57	0.00	3.57
21.45	0.14	0.51	0.27*	3.56	0.00	3.56
21.50	0.14	0.51	0.27*	3.54	0.00	3.54
21.55	0.14	0.51	0.26*	3.52	0.00	3.52
21.60	0.13	0.51	0.26*	3.51	0.00	3.51
21.65	0.13	0.51	0.26*	3.49	0.00	3.49
21.70	0.13	0.52	0.25*	3.48	0.00	3.48
21.75	0.13	0.52	0.25*	3.46	0.00	3.46
21.80	0.13	0.52	0.25*	3.44	0.00	3.44
21.85	0.13	0.52	0.25*	3.43	0.00	3.43
21.90	0.13	0.52	0.24*	3.41	0.00	3.41
21.95	0.12	0.52	0.24*	3.39	0.00	3.39
22.00	0.12	0.52	0.24*	3.37	0.00	3.37
22.05	0.12	0.52	0.23*	3.36	0.00	3.36
22.10	0.12	0.52	0.23*	3.34	0.00	3.34
22.15	0.12	0.52	0.23*	3.32	0.00	3.32
22.20	0.12	0.52	0.23*	3.31	0.00	3.31
22.25	0.12	0.52	0.23*	3.29	0.00	3.29
22.30	0.12	0.52	0.22*	3.27	0.00	3.27
22.35	0.11	0.52	0.22*	3.25	0.00	3.25
22.40	0.11	0.52	0.22*	3.24	0.00	3.24
22.45	0.11	0.52	0.22*	3.22	0.00	3.22
22.50	0.11	0.52	0.22*	3.20	0.00	3.20
22.55	0.11	0.52	0.22*	3.18	0.00	3.18
22.60	0.11	0.52	0.22*	3.16	0.00	3.16
22.65	0.12	0.52	0.22*	3.15	0.00	3.15
22.70	0.12	0.52	0.22*	3.13	0.00	3.13
22.75	0.12	0.52	0.22*	3.11	0.00	3.11
22.80	0.12	0.52	0.23*	3.09	0.00	3.09
22.85	0.12	0.52	0.23*	3.07	0.00	3.07
22.90	0.12	0.52	0.23*	3.06	0.00	3.06
22.95	0.12	0.52	0.23*	3.04	0.00	3.04
23.00	0.12	0.52	0.23*	3.02	0.00	3.02
23.05	0.12	0.52	0.24*	3.01	0.00	3.01
23.10	0.13	0.52	0.24*	2.99	0.00	2.99
23.15	0.13	0.52	0.24*	2.97	0.00	2.97
23.20	0.13	0.52	0.24*	2.96	0.00	2.96
23.25	0.13	0.52	0.25*	2.94	0.00	2.94
23.30	0.13	0.52	0.25*	2.92	0.00	2.92
23.35	0.13	0.52	0.25*	2.91	0.00	2.91
23.40	0.13	0.52	0.26*	2.89	0.00	2.89
23.45	0.14	0.52	0.26*	2.87	0.00	2.87
23.50	0.14	0.52	0.26*	2.86	0.00	2.86
23.55	0.14	0.52	0.27*	2.84	0.00	2.84
23.60	0.14	0.53	0.28*	2.83	0.00	2.83
23.65	0.15	0.53	0.28*	2.81	0.00	2.81
23.70	0.15	0.53	0.29*	2.80	0.00	2.80
23.75	0.16	0.53	0.30*	2.78	0.00	2.78
23.80	0.16	0.53	0.31*	2.77	0.00	2.77
23.85	0.17	0.53	0.32*	2.75	0.00	2.75
23.90	0.17	0.53	0.33*	2.74	0.00	2.74
23.95	0.18	0.53	0.34*	2.72	0.00	2.72
24.00	0.18	0.53	0.35*	2.71	0.00	2.71
24.05	0.19	0.53	0.36*	2.69	0.00	2.69
24.10	0.20	0.53	0.37*	2.68	0.00	2.68
24.15	0.20	0.53	0.39*	2.67	0.00	2.67
24.20	0.21	0.53	0.40*	2.65	0.00	2.65
24.25	0.22	0.53	0.41*	2.64	0.00	2.64
24.30	0.22	0.53	0.42*	2.63	0.00	2.63
24.35	0.23	0.53	0.44*	2.62	0.00	2.62
24.40	0.24	0.53	0.45*	2.60	0.00	2.60
24.45	0.25	0.53	0.47*	2.59	0.00	2.59
24.50	0.26	0.53	0.48*	2.58	0.00	2.58
24.55	0.26	0.53	0.49*	2.57	0.00	2.57
24.60	0.26	0.53	0.50*	2.56	0.00	2.56
24.65	0.27	0.53	0.50*	2.54	0.00	2.54
24.70	0.27	0.53	0.51*	2.53	0.00	2.53
24.75	0.27	0.53	0.51*	2.52	0.00	2.52
24.80	0.27	0.53	0.52*	2.51	0.00	2.51
24.85	0.28	0.53	0.52*	2.50	0.00	2.50
24.90	0.28	0.53	0.53*	2.49	0.00	2.49
24.95	0.28	0.53	0.53*	2.47	0.00	2.47
25.00	0.29	0.53	0.54*	2.46	0.00	2.46
25.05	0.29	0.53	0.55*	2.45	0.00	2.45
25.10	0.29	0.53	0.55*	2.44	0.00	2.44
25.15	0.30	0.53	0.56*	2.43	0.00	2.43
25.20	0.30	0.53	0.56*	2.42	0.00	2.42
25.25	0.30	0.53	0.57*	2.41	0.00	2.41
25.30	0.31	0.53	0.58*	2.40	0.00	2.40
25.35	0.31	0.53	0.58*	2.39	0.00	2.39
25.40	0.31	0.53	0.59*	2.38	0.00	2.38
25.45	0.32	0.53	0.59*	2.37	0.00	2.37
25.50	0.32	0.53	0.60*	2.36	0.00	2.36
25.55	0.33	0.53	0.61*	2.35	0.00	2.35
25.60	0.33	0.53	0.63*	2.34	0.00	2.34
25.65	0.34	0.53	0.64*	2.33	0.00	2.33
25.70	0.35	0.53	0.65*	2.32	0.00	2.32
25.75	0.36	0.53	0.67*	2.31	0.00	2.31
25.80	0.37	0.53	0.68*	2.30	0.00	2.30
25.85	0.37	0.53	0.70*	2.29	0.00	2.29
25.90	0.38	0.53	0.72*	2.28	0.00	2.28
25.95	0.39	0.54	0.73*	2.27	0.00	2.27
26.00	0.40	0.54	0.75*	2.27	0.00	2.27
26.05	0.41	0.54	0.77*	2.26	0.00	2.26
26.10	0.42	0.54	0.78*	2.25	0.00	2.25
26.15	0.43	0.54	0.80*	2.25	0.00	2.25
26.20	0.44	0.54	0.82*	2.24	0.00	2.24
26.25	0.45	0.54	0.84*	2.23	0.00	2.23
26.30	0.46	0.54	0.86*	2.23	0.00	2.23
26.35	0.48	0.54	0.89*	2.22	0.00	2.22
26.40	0.49	0.54	0.92*	2.22	0.00	2.22
26.45	0.51	0.54	0.95*	2.22	0.00	2.22
26.50	0.53	0.54	0.98*	2.21	0.00	2.21
26.55	0.54	0.54	1.01	2.21	0.00	2.21
26.60	0.56	0.54	1.04	2.21	0.00	2.21
26.65	0.57	0.54	1.07	2.20	0.00	2.20
26.70	0.59	0.54	1.09	2.20	0.00	2.20
26.75	0.60	0.54	1.12	2.20	0.00	2.20
26.80	0.62	0.54	1.15	2.20	0.00	2.20
26.85	0.64	0.54	1.18	2.19	0.00	2.19
26.90	0.65	0.54	1.22	2.19	0.00	2.19
26.95	0.67	0.54	1.25	2.19	0.00	2.19
27.00	0.69	0.54	1.28	2.19	0.00	2.19
27.05	0.71	0.54	1.31	2.19	0.00	2.19
27.10	0.73	0.54	1.35	2.19	0.00	2.19
27.15	0.74	0.54	1.38	2.19	0.00	2.19
27.20	0.76	0.54	1.41	2.19	0.00	2.19
27.25	0.78	0.54	1.45	2.19	0.00	2.19
27.30	0.80	0.54	1.48	2.19	0.00	2.19
27.35	0.82	0.54	1.52	2.19	0.00	2.19
27.40	0.84	0.54	1.56	2.19	0.00	2.19

27.45	0.86	0.54	1.60	2.19	0.00	-2.19
27.50	0.88	0.54	1.63	2.19	0.00	2.19
27.55	0.84	0.54	1.56	2.19	0.00	2.19
27.60	0.80	0.54	1.48	2.19	0.00	2.19
27.65	0.76	0.54	1.41	2.19	0.00	2.19
27.70	0.73	0.54	1.34	2.19	0.00	2.19
27.75	0.69	0.54	1.28	2.19	0.00	2.19
27.80	0.66	0.54	1.21	2.18	0.00	2.18
27.85	0.62	0.54	1.15	2.18	0.00	2.18
27.90	0.59	0.54	1.09	2.18	0.00	2.18
27.95	0.56	0.54	1.04	2.18	0.00	2.18
28.00	0.53	0.54	0.98*	2.18	0.00	2.18
28.05	0.50	0.54	0.93*	2.17	0.00	2.17
28.10	0.48	0.54	0.88*	2.17	0.00	2.17
28.15	0.46	0.54	0.84*	2.17	0.00	2.17
28.20	0.44	0.54	0.81*	2.16	0.00	2.16
28.25	0.42	0.54	0.77*	2.15	0.00	2.15
28.30	0.40	0.54	0.74*	2.15	0.00	2.15
28.35	0.39	0.54	0.71*	2.14	0.00	2.14
28.40	0.37	0.54	0.68*	2.13	0.00	2.13
28.45	0.35	0.54	0.65*	2.12	0.00	2.12
28.50	0.34	0.54	0.62*	2.11	0.00	2.11
28.55	0.32	0.54	0.58*	2.11	0.00	2.11
28.60	0.29	0.54	0.54*	2.09	0.00	2.09
28.65	0.27	0.54	0.50*	2.08	0.00	2.08
28.70	0.26	0.54	0.47*	2.07	0.00	2.07
28.75	0.24	0.54	0.44*	2.06	0.00	2.06
28.80	0.22	0.54	0.41*	2.05	0.00	2.05
28.85	0.21	0.54	0.38*	2.04	0.00	2.04
28.90	0.19	0.55	0.36*	2.02	0.00	2.02
28.95	0.18	0.55	0.33*	2.01	0.00	2.01
29.00	0.17	0.55	0.31*	2.00	0.00	2.00
29.05	0.16	0.55	0.29*	1.98	0.00	1.98
29.10	0.15	0.55	0.28*	1.97	0.00	1.97
29.15	0.14	0.55	0.26*	1.95	0.00	1.95
29.20	0.14	0.55	0.25*	1.94	0.00	1.94
29.25	0.13	0.55	0.24*	1.92	0.00	1.92
29.30	0.13	0.55	0.24*	1.91	0.00	1.91
29.35	0.13	0.55	0.23*	1.89	0.00	1.89
29.40	0.13	0.55	0.24*	1.88	0.00	1.88
29.45	0.15	0.55	0.27*	1.86	0.00	1.86
29.50	2.00	0.55	5.00	1.85	0.00	1.85
29.55	2.00	0.55	5.00	1.85	0.00	1.85
29.60	2.00	0.55	5.00	1.85	0.00	1.85
29.65	2.00	0.55	5.00	1.85	0.00	1.85
29.70	2.00	0.55	5.00	1.85	0.00	1.85
29.75	2.00	0.55	5.00	1.85	0.00	1.85
29.80	2.00	0.55	5.00	1.85	0.00	1.85
29.85	2.00	0.55	5.00	1.85	0.00	1.85
29.90	2.00	0.55	5.00	1.85	0.00	1.85
29.95	2.00	0.55	5.00	1.85	0.00	1.85
30.00	2.00	0.55	5.00	1.85	0.00	1.85
30.05	2.00	0.55	5.00	1.85	0.00	1.85
30.10	2.00	0.55	5.00	1.85	0.00	1.85
30.15	2.00	0.55	5.00	1.85	0.00	1.85
30.20	2.00	0.55	5.00	1.85	0.00	1.85
30.25	2.00	0.55	5.00	1.85	0.00	1.85
30.30	2.00	0.55	5.00	1.85	0.00	1.85
30.35	2.00	0.55	5.00	1.85	0.00	1.85
30.40	2.00	0.55	5.00	1.85	0.00	1.85
30.45	2.00	0.55	5.00	1.85	0.00	1.85
30.50	2.00	0.55	5.00	1.85	0.00	1.85
30.55	2.00	0.55	5.00	1.85	0.00	1.85
30.60	2.00	0.55	5.00	1.85	0.00	1.85
30.65	2.00	0.55	5.00	1.85	0.00	1.85
30.70	2.00	0.55	5.00	1.85	0.00	1.85
30.75	2.00	0.55	5.00	1.85	0.00	1.85
30.80	2.00	0.55	5.00	1.85	0.00	1.85
30.85	2.00	0.55	5.00	1.85	0.00	1.85
30.90	2.00	0.55	5.00	1.85	0.00	1.85
30.95	2.00	0.55	5.00	1.85	0.00	1.85
31.00	2.00	0.55	5.00	1.85	0.00	1.85
31.05	2.00	0.55	5.00	1.85	0.00	1.85
31.10	2.00	0.55	5.00	1.85	0.00	1.85
31.15	2.00	0.55	5.00	1.85	0.00	1.85
31.20	2.00	0.55	5.00	1.85	0.00	1.85
31.25	2.00	0.55	5.00	1.85	0.00	1.85
31.30	2.00	0.55	5.00	1.85	0.00	1.85
31.35	2.00	0.54	5.00	1.85	0.00	1.85
31.40	2.00	0.54	5.00	1.85	0.00	1.85
31.45	2.00	0.54	5.00	1.85	0.00	1.85
31.50	2.00	0.54	5.00	1.85	0.00	1.85
31.55	2.00	0.54	5.00	1.85	0.00	1.85
31.60	2.00	0.54	5.00	1.85	0.00	1.85
31.65	2.00	0.54	5.00	1.85	0.00	1.85
31.70	2.00	0.54	5.00	1.85	0.00	1.85
31.75	2.00	0.54	5.00	1.85	0.00	1.85
31.80	2.00	0.54	5.00	1.85	0.00	1.85
31.85	2.00	0.54	5.00	1.85	0.00	1.85
31.90	2.00	0.54	5.00	1.85	0.00	1.85
31.95	2.00	0.54	5.00	1.85	0.00	1.85
32.00	2.00	0.54	5.00	1.85	0.00	1.85
32.05	2.00	0.54	5.00	1.85	0.00	1.85
32.10	2.00	0.54	5.00	1.85	0.00	1.85
32.15	2.00	0.54	5.00	1.85	0.00	1.85
32.20	2.00	0.54	5.00	1.85	0.00	1.85
32.25	2.00	0.54	5.00	1.85	0.00	1.85
32.30	2.00	0.54	5.00	1.85	0.00	1.85
32.35	2.00	0.54	5.00	1.85	0.00	1.85
32.40	2.00	0.54	5.00	1.85	0.00	1.85
32.45	2.00	0.54	5.00	1.85	0.00	1.85
32.50	2.00	0.54	5.00	1.85	0.00	1.85
32.55	2.00	0.54	5.00	1.85	0.00	1.85
32.60	2.00	0.54	5.00	1.85	0.00	1.85
32.65	2.00	0.54	5.00	1.85	0.00	1.85
32.70	2.00	0.54	5.00	1.85	0.00	1.85
32.75	2.00	0.54	5.00	1.85	0.00	1.85
32.80	2.00	0.54	5.00	1.85	0.00	1.85
32.85	2.00	0.54	5.00	1.85	0.00	1.85
32.90	2.00	0.54	5.00	1.85	0.00	1.85
32.95	2.00	0.54	5.00	1.85	0.00	1.85
33.00	2.00	0.54	5.00	1.85	0.00	1.85
33.05	2.00	0.54	5.00	1.85	0.00	1.85
33.10	2.00	0.54	5.00	1.85	0.00	1.85
33.15	2.00	0.54	5.00	1.85	0.00	1.85
33.20	2.00	0.54	5.00	1.85	0.00	1.85
33.25	2.00	0.54	5.00	1.85	0.00	1.85
33.30	2.00	0.54	5.00	1.85	0.00	1.85
33.35	2.00	0.54	5.00	1.85	0.00	1.85
33.40	2.00	0.54	5.00	1.85	0.00	1.85
33.45	2.00	0.54	5.00	1.85	0.00	1.85
33.50	2.00	0.54	5.00	1.85	0.00	1.85
33.55	2.00	0.54	5.00	1.85	0.00	1.85
33.60	2.00	0.54	5.00	1.85	0.00	1.85
33.65	2.00	0.54	5.00	1.85	0.00	1.85
33.70	2.00	0.54	5.00	1.85	0.00	1.85
33.75	2.00	0.54	5.00	1.85	0.00	1.85
33.80	2.00	0.54	5.00	1.85	0.00	1.85
33.85	2.00	0.54	5.00	1.85	0.00	1.85
33.90	2.00	0.54	5.00	1.85	0.00	1.85
33.95	2.00	0.54	5.00	1.85	0.00	1.85
34.00	2.00	0.54	5.00	1.85	0.00	1.85
34.05	2.00	0.54	5.00	1.85	0.00	1.85
34.10	2.00	0.54	5.00	1.85	0.00	1.85
34.15	2.00	0.54	5.00	1.85	0.00	1.85
34.20	2.00	0.54	5.00	1.85	0.00	1.85
34.25	2.00	0.54	5.00	1.85	0.00	1.85
34.30	2.00	0.54	5.00	1.85	0.00	1.85

34.35	2.00	0.54	5.00	1.85	0.00	1.85
34.40	2.00	0.54	5.00	1.85	0.00	1.85
34.45	2.00	0.54	5.00	1.85	0.00	1.85
34.50	2.00	0.54	5.00	1.85	0.00	1.85
34.55	2.00	0.54	5.00	1.85	0.00	1.85
34.60	2.00	0.54	5.00	1.85	0.00	1.85
34.65	2.00	0.54	5.00	1.85	0.00	1.85
34.70	2.00	0.54	5.00	1.85	0.00	1.85
34.75	2.00	0.54	5.00	1.85	0.00	1.85
34.80	2.00	0.54	5.00	1.85	0.00	1.85
34.85	2.00	0.54	5.00	1.85	0.00	1.85
34.90	2.00	0.54	5.00	1.85	0.00	1.85
34.95	2.00	0.54	5.00	1.85	0.00	1.85
35.00	2.00	0.54	5.00	1.85	0.00	1.85
35.05	2.00	0.53	5.00	1.85	0.00	1.85
35.10	2.00	0.53	5.00	1.85	0.00	1.85
35.15	2.00	0.53	5.00	1.85	0.00	1.85
35.20	2.00	0.53	5.00	1.85	0.00	1.85
35.25	2.00	0.53	5.00	1.85	0.00	1.85
35.30	2.00	0.53	5.00	1.85	0.00	1.85
35.35	2.00	0.53	5.00	1.85	0.00	1.85
35.40	2.00	0.53	5.00	1.85	0.00	1.85
35.45	2.00	0.53	5.00	1.85	0.00	1.85
35.50	2.00	0.53	5.00	1.85	0.00	1.85
35.55	2.00	0.53	5.00	1.85	0.00	1.85
35.60	2.00	0.53	5.00	1.85	0.00	1.85
35.65	2.00	0.53	5.00	1.85	0.00	1.85
35.70	2.00	0.53	5.00	1.85	0.00	1.85
35.75	2.00	0.53	5.00	1.85	0.00	1.85
35.80	2.00	0.53	5.00	1.85	0.00	1.85
35.85	2.00	0.53	5.00	1.85	0.00	1.85
35.90	2.00	0.53	5.00	1.85	0.00	1.85
35.95	2.00	0.53	5.00	1.85	0.00	1.85
36.00	2.00	0.53	5.00	1.85	0.00	1.85
36.05	2.00	0.53	5.00	1.85	0.00	1.85
36.10	2.00	0.53	5.00	1.85	0.00	1.85
36.15	2.00	0.53	5.00	1.85	0.00	1.85
36.20	2.00	0.53	5.00	1.85	0.00	1.85
36.25	2.00	0.53	5.00	1.85	0.00	1.85
36.30	2.00	0.53	5.00	1.85	0.00	1.85
36.35	2.00	0.53	5.00	1.85	0.00	1.85
36.40	2.00	0.53	5.00	1.85	0.00	1.85
36.45	2.00	0.53	5.00	1.85	0.00	1.85
36.50	2.00	0.53	5.00	1.85	0.00	1.85
36.55	0.12	0.53	0.22*	1.85	0.00	1.85
36.60	0.12	0.53	0.22*	1.83	0.00	1.83
36.65	0.12	0.53	0.22*	1.82	0.00	1.82
36.70	0.11	0.53	0.22*	1.80	0.00	1.80
36.75	0.11	0.53	0.22*	1.78	0.00	1.78
36.80	0.11	0.53	0.22*	1.76	0.00	1.76
36.85	0.11	0.53	0.21*	1.75	0.00	1.75
36.90	0.11	0.53	0.21*	1.73	0.00	1.73
36.95	0.11	0.53	0.21*	1.71	0.00	1.71
37.00	0.11	0.53	0.22*	1.69	0.00	1.69
37.05	0.11	0.53	0.22*	1.68	0.00	1.68
37.10	0.11	0.53	0.22*	1.66	0.00	1.66
37.15	0.11	0.53	0.22*	1.64	0.00	1.64
37.20	0.12	0.53	0.22*	1.62	0.00	1.62
37.25	0.12	0.53	0.22*	1.61	0.00	1.61
37.30	0.12	0.53	0.22*	1.59	0.00	1.59
37.35	0.12	0.53	0.22*	1.57	0.00	1.57
37.40	0.12	0.53	0.22*	1.55	0.00	1.55
37.45	0.12	0.53	0.22*	1.53	0.00	1.53
37.50	0.12	0.53	0.22*	1.52	0.00	1.52
37.55	0.12	0.53	0.22*	1.50	0.00	1.50
37.60	0.12	0.53	0.22*	1.48	0.00	1.48
37.65	0.12	0.53	0.22*	1.46	0.00	1.46
37.70	0.11	0.53	0.22*	1.44	0.00	1.44
37.75	0.11	0.53	0.22*	1.43	0.00	1.43
37.80	0.11	0.53	0.22*	1.41	0.00	1.41
37.85	0.11	0.53	0.21*	1.39	0.00	1.39
37.90	0.11	0.53	0.21*	1.37	0.00	1.37
37.95	0.11	0.53	0.21*	1.35	0.00	1.35
38.00	0.11	0.53	0.21*	1.33	0.00	1.33
38.05	0.11	0.53	0.21*	1.32	0.00	1.32
38.10	0.11	0.53	0.21*	1.30	0.00	1.30
38.15	0.11	0.53	0.21*	1.28	0.00	1.28
38.20	0.11	0.53	0.21*	1.26	0.00	1.26
38.25	0.11	0.53	0.21*	1.24	0.00	1.24
38.30	0.11	0.53	0.21*	1.22	0.00	1.22
38.35	0.11	0.53	0.21*	1.21	0.00	1.21
38.40	0.11	0.53	0.21*	1.19	0.00	1.19
38.45	0.11	0.53	0.21*	1.17	0.00	1.17
38.50	0.11	0.53	0.21*	1.15	0.00	1.15
38.55	0.11	0.53	0.21*	1.13	0.00	1.13
38.60	0.11	0.53	0.21*	1.12	0.00	1.12
38.65	0.11	0.53	0.21*	1.10	0.00	1.10
38.70	0.11	0.53	0.21*	1.08	0.00	1.08
38.75	0.11	0.53	0.22*	1.07	0.00	1.07
38.80	0.12	0.53	0.22*	1.05	0.00	1.05
38.85	0.12	0.53	0.23*	1.03	0.00	1.03
38.90	2.00	0.53	5.00	1.02	0.00	1.02
38.95	2.00	0.53	5.00	1.02	0.00	1.02
39.00	2.00	0.53	5.00	1.02	0.00	1.02
39.05	2.00	0.52	5.00	1.02	0.00	1.02
39.10	2.00	0.52	5.00	1.02	0.00	1.02
39.15	2.00	0.52	5.00	1.02	0.00	1.02
39.20	2.00	0.52	5.00	1.02	0.00	1.02
39.25	2.00	0.52	5.00	1.02	0.00	1.02
39.30	2.00	0.52	5.00	1.02	0.00	1.02
39.35	2.00	0.52	5.00	1.02	0.00	1.02
39.40	2.00	0.52	5.00	1.02	0.00	1.02
39.45	2.00	0.52	5.00	1.02	0.00	1.02
39.50	2.00	0.52	5.00	1.02	0.00	1.02
39.55	2.00	0.52	5.00	1.02	0.00	1.02
39.60	2.00	0.52	5.00	1.02	0.00	1.02
39.65	2.00	0.52	5.00	1.02	0.00	1.02
39.70	2.00	0.52	5.00	1.02	0.00	1.02
39.75	2.00	0.52	5.00	1.02	0.00	1.02
39.80	2.00	0.52	5.00	1.02	0.00	1.02
39.85	2.00	0.52	5.00	1.02	0.00	1.02
39.90	2.00	0.52	5.00	1.02	0.00	1.02
39.95	2.00	0.52	5.00	1.02	0.00	1.02
40.00	2.00	0.52	5.00	1.02	0.00	1.02
40.05	2.00	0.52	5.00	1.02	0.00	1.02
40.10	2.00	0.52	5.00	1.02	0.00	1.02
40.15	2.00	0.52	5.00	1.02	0.00	1.02
40.20	2.00	0.52	5.00	1.02	0.00	1.02
40.25	2.00	0.52	5.00	1.02	0.00	1.02
40.30	2.00	0.52	5.00	1.02	0.00	1.02
40.35	2.00	0.52	5.00	1.02	0.00	1.02
40.40	2.00	0.52	5.00	1.02	0.00	1.02
40.45	2.00	0.52	5.00	1.02	0.00	1.02
40.50	2.00	0.52	5.00	1.02	0.00	1.02
40.55	2.00	0.52	5.00	1.02	0.00	1.02
40.60	2.00	0.52	5.00	1.02	0.00	1.02
40.65	2.00	0.52	5.00	1.02	0.00	1.02
40.70	2.00	0.52	5.00	1.02	0.00	1.02
40.75	2.00	0.52	5.00	1.02	0.00	1.02
40.80	2.00	0.52	5.00	1.02	0.00	1.02
40.85	2.00	0.52	5.00	1.02	0.00	1.02
40.90	2.00	0.52	5.00	1.02	0.00	1.02
40.95	2.00	0.52	5.00	1.02	0.00	1.02
41.00	2.00	0.52	5.00	1.02	0.00	1.02
41.05	2.00	0.52	5.00	1.02	0.00	1.02
41.10	2.00	0.52	5.00	1.02	0.00	1.02
41.15	2.00	0.52	5.00	1.02	0.00	1.02
41.20	2.00	0.52	5.00	1.02	0.00	1.02

41.25	2.00	0.52	5.00	1.02	0.00	1.02
41.30	2.00	0.52	5.00	1.02	0.00	1.02
41.35	2.00	0.52	5.00	1.02	0.00	1.02
41.40	2.00	0.52	5.00	1.02	0.00	1.02
41.45	2.00	0.52	5.00	1.02	0.00	1.02
41.50	2.00	0.52	5.00	1.02	0.00	1.02
41.55	2.00	0.52	5.00	1.02	0.00	1.02
41.60	2.00	0.52	5.00	1.02	0.00	1.02
41.65	2.00	0.52	5.00	1.02	0.00	1.02
41.70	2.00	0.52	5.00	1.02	0.00	1.02
41.75	2.00	0.51	5.00	1.02	0.00	1.02
41.80	2.00	0.51	5.00	1.02	0.00	1.02
41.85	2.00	0.51	5.00	1.02	0.00	1.02
41.90	2.00	0.51	5.00	1.02	0.00	1.02
41.95	2.00	0.51	5.00	1.02	0.00	1.02
42.00	2.00	0.51	5.00	1.02	0.00	1.02
42.05	2.00	0.51	5.00	1.02	0.00	1.02
42.10	2.00	0.51	5.00	1.02	0.00	1.02
42.15	2.00	0.51	5.00	1.02	0.00	1.02
42.20	2.00	0.51	5.00	1.02	0.00	1.02
42.25	2.00	0.51	5.00	1.02	0.00	1.02
42.30	2.00	0.51	5.00	1.02	0.00	1.02
42.35	2.00	0.51	5.00	1.02	0.00	1.02
42.40	2.00	0.51	5.00	1.02	0.00	1.02
42.45	2.00	0.51	5.00	1.02	0.00	1.02
42.50	2.00	0.51	5.00	1.02	0.00	1.02
42.55	2.00	0.51	5.00	1.02	0.00	1.02
42.60	2.00	0.51	5.00	1.02	0.00	1.02
42.65	2.00	0.51	5.00	1.02	0.00	1.02
42.70	2.00	0.51	5.00	1.02	0.00	1.02
42.75	2.00	0.51	5.00	1.02	0.00	1.02
42.80	2.00	0.51	5.00	1.02	0.00	1.02
42.85	2.00	0.51	5.00	1.02	0.00	1.02
42.90	2.00	0.51	5.00	1.02	0.00	1.02
42.95	2.00	0.51	5.00	1.02	0.00	1.02
43.00	2.00	0.51	5.00	1.02	0.00	1.02
43.05	2.00	0.51	5.00	1.02	0.00	1.02
43.10	2.00	0.51	5.00	1.02	0.00	1.02
43.15	2.00	0.51	5.00	1.02	0.00	1.02
43.20	2.00	0.51	5.00	1.02	0.00	1.02
43.25	2.00	0.51	5.00	1.02	0.00	1.02
43.30	2.00	0.51	5.00	1.02	0.00	1.02
43.35	2.00	0.51	5.00	1.02	0.00	1.02
43.40	2.00	0.51	5.00	1.02	0.00	1.02
43.45	2.00	0.51	5.00	1.02	0.00	1.02
43.50	2.00	0.51	5.00	1.02	0.00	1.02
43.55	2.00	0.51	5.00	1.02	0.00	1.02
43.60	2.00	0.51	5.00	1.02	0.00	1.02
43.65	2.00	0.51	5.00	1.02	0.00	1.02
43.70	2.00	0.51	5.00	1.02	0.00	1.02
43.75	2.00	0.51	5.00	1.02	0.00	1.02
43.80	2.00	0.51	5.00	1.02	0.00	1.02
43.85	2.00	0.51	5.00	1.02	0.00	1.02
43.90	2.00	0.51	5.00	1.02	0.00	1.02
43.95	2.00	0.51	5.00	1.02	0.00	1.02
44.00	2.00	0.51	5.00	1.02	0.00	1.02
44.05	2.00	0.51	5.00	1.02	0.00	1.02
44.10	2.00	0.51	5.00	1.02	0.00	1.02
44.15	2.00	0.51	5.00	1.02	0.00	1.02
44.20	2.00	0.51	5.00	1.02	0.00	1.02
44.25	2.00	0.51	5.00	1.02	0.00	1.02
44.30	2.00	0.50	5.00	1.02	0.00	1.02
44.35	2.00	0.50	5.00	1.02	0.00	1.02
44.40	2.00	0.50	5.00	1.02	0.00	1.02
44.45	2.00	0.50	5.00	1.02	0.00	1.02
44.50	2.00	0.50	5.00	1.02	0.00	1.02
44.55	2.00	0.50	5.00	1.02	0.00	1.02
44.60	2.00	0.50	5.00	1.02	0.00	1.02
44.65	2.00	0.50	5.00	1.02	0.00	1.02
44.70	2.00	0.50	5.00	1.02	0.00	1.02
44.75	2.00	0.50	5.00	1.02	0.00	1.02
44.80	2.00	0.50	5.00	1.02	0.00	1.02
44.85	2.00	0.50	5.00	1.02	0.00	1.02
44.90	2.00	0.50	5.00	1.02	0.00	1.02
44.95	2.00	0.50	5.00	1.02	0.00	1.02
45.00	2.00	0.50	5.00	1.02	0.00	1.02
45.05	2.00	0.50	5.00	1.02	0.00	1.02
45.10	2.00	0.50	5.00	1.02	0.00	1.02
45.15	2.00	0.50	5.00	1.02	0.00	1.02
45.20	2.00	0.50	5.00	1.02	0.00	1.02
45.25	2.00	0.50	5.00	1.02	0.00	1.02
45.30	2.00	0.50	5.00	1.02	0.00	1.02
45.35	2.00	0.50	5.00	1.02	0.00	1.02
45.40	2.00	0.50	5.00	1.02	0.00	1.02
45.45	2.00	0.50	5.00	1.02	0.00	1.02
45.50	2.00	0.50	5.00	1.02	0.00	1.02
45.55	2.00	0.50	5.00	1.02	0.00	1.02
45.60	2.00	0.50	5.00	1.02	0.00	1.02
45.65	2.00	0.50	5.00	1.02	0.00	1.02
45.70	2.00	0.50	5.00	1.02	0.00	1.02
45.75	2.00	0.50	5.00	1.02	0.00	1.02
45.80	2.00	0.50	5.00	1.02	0.00	1.02
45.85	2.00	0.50	5.00	1.02	0.00	1.02
45.90	2.00	0.50	5.00	1.02	0.00	1.02
45.95	2.00	0.50	5.00	1.02	0.00	1.02
46.00	2.00	0.50	5.00	1.02	0.00	1.02
46.05	2.00	0.50	5.00	1.02	0.00	1.02
46.10	2.00	0.50	5.00	1.02	0.00	1.02
46.15	2.00	0.50	5.00	1.02	0.00	1.02
46.20	2.00	0.50	5.00	1.02	0.00	1.02
46.25	2.00	0.50	5.00	1.02	0.00	1.02
46.30	2.00	0.50	5.00	1.02	0.00	1.02
46.35	2.00	0.50	5.00	1.02	0.00	1.02
46.40	2.00	0.50	5.00	1.02	0.00	1.02
46.45	2.00	0.50	5.00	1.02	0.00	1.02
46.50	2.00	0.50	5.00	1.02	0.00	1.02
46.55	2.00	0.50	5.00	1.02	0.00	1.02
46.60	2.00	0.50	5.00	1.02	0.00	1.02
46.65	2.00	0.50	5.00	1.02	0.00	1.02
46.70	2.00	0.50	5.00	1.02	0.00	1.02
46.75	2.00	0.49	5.00	1.02	0.00	1.02
46.80	2.00	0.49	5.00	1.02	0.00	1.02
46.85	2.00	0.49	5.00	1.02	0.00	1.02
46.90	2.00	0.49	5.00	1.02	0.00	1.02
46.95	2.00	0.49	5.00	1.02	0.00	1.02
47.00	2.00	0.49	5.00	1.02	0.00	1.02
47.05	2.00	0.49	5.00	1.02	0.00	1.02
47.10	2.00	0.49	5.00	1.02	0.00	1.02
47.15	2.00	0.49	5.00	1.02	0.00	1.02
47.20	2.00	0.49	5.00	1.02	0.00	1.02
47.25	2.00	0.49	5.00	1.02	0.00	1.02
47.30	2.00	0.49	5.00	1.02	0.00	1.02
47.35	2.00	0.49	5.00	1.02	0.00	1.02
47.40	2.00	0.49	5.00	1.02	0.00	1.02
47.45	2.00	0.49	5.00	1.02	0.00	1.02
47.50	2.00	0.49	5.00	1.02	0.00	1.02
47.55	2.00	0.49	5.00	1.02	0.00	1.02
47.60	2.00	0.49	5.00	1.02	0.00	1.02
47.65	2.00	0.49	5.00	1.02	0.00	1.02
47.70	2.00	0.49	5.00	1.02	0.00	1.02
47.75	2.00	0.49	5.00	1.02	0.00	1.02
47.80	2.00	0.49	5.00	1.02	0.00	1.02
47.85	2.00	0.49	5.00	1.02	0.00	1.02
47.90	2.00	0.49	5.00	1.02	0.00	1.02
47.95	2.00	0.49	5.00	1.02	0.00	1.02
48.00	2.00	0.49	5.00	1.02	0.00	1.02
48.05	2.00	0.49	5.00	1.02	0.00	1.02
48.10	2.00	0.49	5.00	1.02	0.00	1.02

48.15	2.00	0.49	5.00	1.02	0.00	1.02
48.20	2.00	0.49	5.00	1.02	0.00	1.02
48.25	2.00	0.49	5.00	1.02	0.00	1.02
48.30	2.00	0.49	5.00	1.02	0.00	1.02
48.35	2.00	0.49	5.00	1.02	0.00	1.02
48.40	2.00	0.49	5.00	1.02	0.00	1.02
48.45	2.00	0.49	5.00	1.02	0.00	1.02
48.50	2.00	0.49	5.00	1.02	0.00	1.02
48.55	2.00	0.49	5.00	1.02	0.00	1.02
48.60	2.00	0.49	5.00	1.02	0.00	1.02
48.65	2.00	0.49	5.00	1.02	0.00	1.02
48.70	2.00	0.49	5.00	1.02	0.00	1.02
48.75	2.00	0.49	5.00	1.02	0.00	1.02
48.80	2.00	0.49	5.00	1.02	0.00	1.02
48.85	2.00	0.49	5.00	1.02	0.00	1.02
48.90	2.00	0.49	5.00	1.02	0.00	1.02
48.95	2.00	0.49	5.00	1.02	0.00	1.02
49.00	2.00	0.49	5.00	1.02	0.00	1.02
49.05	2.00	0.49	5.00	1.02	0.00	1.02
49.10	2.00	0.48	5.00	1.02	0.00	1.02
49.15	2.00	0.48	5.00	1.02	0.00	1.02
49.20	2.00	0.48	5.00	1.02	0.00	1.02
49.25	2.00	0.48	5.00	1.02	0.00	1.02
49.30	2.00	0.48	5.00	1.02	0.00	1.02
49.35	2.00	0.48	5.00	1.02	0.00	1.02
49.40	2.00	0.48	5.00	1.02	0.00	1.02
49.45	2.00	0.48	5.00	1.02	0.00	1.02
49.50	0.63	0.48	1.31	1.02	0.00	1.02
49.55	0.65	0.48	1.34	1.02	0.00	1.02
49.60	0.66	0.48	1.36	1.02	0.00	1.02
49.65	0.67	0.48	1.38	1.01	0.00	1.01
49.70	0.68	0.48	1.41	1.01	0.00	1.01
49.75	0.69	0.48	1.43	1.01	0.00	1.01
49.80	0.70	0.48	1.45	1.01	0.00	1.01
49.85	0.71	0.48	1.48	1.01	0.00	1.01
49.90	0.72	0.48	1.50	1.01	0.00	1.01
49.95	0.74	0.48	1.53	1.01	0.00	1.01
50.00	0.75	0.48	1.55	1.01	0.00	1.01
50.05	0.76	0.48	1.58	1.01	0.00	1.01
50.10	0.77	0.48	1.61	1.01	0.00	1.01
50.15	0.78	0.48	1.63	1.01	0.00	1.01
50.20	0.80	0.48	1.66	1.01	0.00	1.01
50.25	0.81	0.48	1.69	1.01	0.00	1.01
50.30	0.82	0.48	1.71	1.01	0.00	1.01
50.35	0.83	0.48	1.74	1.01	0.00	1.01
50.40	0.85	0.48	1.77	1.01	0.00	1.01
50.45	0.86	0.48	1.80	1.01	0.00	1.01
50.50	0.88	0.48	1.84	1.01	0.00	1.01
50.55	0.92	0.48	1.93	1.01	0.00	1.01
50.60	0.97	0.48	2.02	1.01	0.00	1.01
50.65	1.01	0.48	2.11	1.01	0.00	1.01
50.70	1.06	0.48	2.21	1.01	0.00	1.01
50.75	1.11	0.48	2.32	1.01	0.00	1.01
50.80	1.16	0.48	2.42	1.01	0.00	1.01
50.85	1.21	0.48	2.53	1.01	0.00	1.01
50.90	1.26	0.48	2.64	1.01	0.00	1.01
50.95	1.32	0.48	2.76	1.01	0.00	1.01
51.00	1.37	0.48	2.88	1.01	0.00	1.01
51.05	1.43	0.48	3.00	1.01	0.00	1.01
51.10	1.49	0.48	3.13	1.01	0.00	1.01
51.15	1.55	0.48	3.26	1.01	0.00	1.01
51.20	1.61	0.48	3.39	1.01	0.00	1.01
51.25	1.68	0.48	3.53	1.01	0.00	1.01
51.30	1.75	0.48	3.67	1.01	0.00	1.01
51.35	1.81	0.48	3.82	1.01	0.00	1.01
51.40	1.88	0.47	3.97	1.01	0.00	1.01
51.45	1.96	0.47	4.12	1.01	0.00	1.01
51.50	2.04	0.47	4.31	1.01	0.00	1.01
51.55	2.20	0.47	4.63	1.01	0.00	1.01
51.60	2.36	0.47	4.97	1.01	0.00	1.01
51.65	2.38	0.47	5.00	1.01	0.00	1.01
51.70	2.38	0.47	5.00	1.01	0.00	1.01
51.75	2.38	0.47	5.00	1.01	0.00	1.01
51.80	2.38	0.47	5.00	1.01	0.00	1.01
51.85	2.38	0.47	5.00	1.01	0.00	1.01
51.90	2.38	0.47	5.00	1.01	0.00	1.01
51.95	2.38	0.47	5.00	1.01	0.00	1.01
52.00	2.38	0.47	5.00	1.01	0.00	1.01
52.05	2.38	0.47	5.00	1.01	0.00	1.01
52.10	2.38	0.47	5.00	1.01	0.00	1.01
52.15	2.38	0.47	5.00	1.01	0.00	1.01
52.20	2.38	0.47	5.00	1.01	0.00	1.01
52.25	2.38	0.47	5.00	1.01	0.00	1.01
52.30	2.38	0.47	5.00	1.01	0.00	1.01
52.35	2.38	0.47	5.00	1.01	0.00	1.01
52.40	2.38	0.47	5.00	1.01	0.00	1.01
52.45	2.38	0.47	5.00	1.01	0.00	1.01
52.50	2.37	0.47	5.00	1.01	0.00	1.01
52.55	2.37	0.47	5.00	1.01	0.00	1.01
52.60	2.37	0.47	5.00	1.01	0.00	1.01
52.65	2.37	0.47	5.00	1.01	0.00	1.01
52.70	2.37	0.47	5.00	1.01	0.00	1.01
52.75	2.37	0.47	5.00	1.01	0.00	1.01
52.80	2.37	0.47	5.00	1.01	0.00	1.01
52.85	2.37	0.47	5.00	1.01	0.00	1.01
52.90	2.37	0.47	5.00	1.01	0.00	1.01
52.95	2.37	0.47	5.00	1.01	0.00	1.01
53.00	2.37	0.47	5.00	1.01	0.00	1.01
53.05	2.37	0.47	5.00	1.01	0.00	1.01
53.10	2.37	0.47	5.00	1.01	0.00	1.01
53.15	2.37	0.47	5.00	1.01	0.00	1.01
53.20	2.37	0.47	5.00	1.01	0.00	1.01
53.25	2.37	0.47	5.00	1.01	0.00	1.01
53.30	2.37	0.47	5.00	1.01	0.00	1.01
53.35	2.37	0.47	5.00	1.01	0.00	1.01
53.40	2.37	0.47	5.00	1.01	0.00	1.01
53.45	2.37	0.47	5.00	1.01	0.00	1.01
53.50	2.37	0.47	5.00	1.01	0.00	1.01
53.55	2.37	0.47	5.00	1.01	0.00	1.01
53.60	2.37	0.47	5.00	1.01	0.00	1.01
53.65	2.37	0.46	5.00	1.01	0.00	1.01
53.70	2.37	0.46	5.00	1.01	0.00	1.01
53.75	2.37	0.46	5.00	1.01	0.00	1.01
53.80	2.37	0.46	5.00	1.01	0.00	1.01
53.85	2.37	0.46	5.00	1.01	0.00	1.01
53.90	2.37	0.46	5.00	1.01	0.00	1.01
53.95	2.36	0.46	5.00	1.01	0.00	1.01
54.00	2.36	0.46	5.00	1.01	0.00	1.01
54.05	2.36	0.46	5.00	1.01	0.00	1.01
54.10	2.36	0.46	5.00	1.01	0.00	1.01
54.15	2.36	0.46	5.00	1.01	0.00	1.01
54.20	2.36	0.46	5.00	1.01	0.00	1.01
54.25	2.36	0.46	5.00	1.01	0.00	1.01
54.30	2.36	0.46	5.00	1.01	0.00	1.01
54.35	2.36	0.46	5.00	1.01	0.00	1.01
54.40	2.36	0.46	5.00	1.01	0.00	1.01
54.45	2.36	0.46	5.00	1.01	0.00	1.01
54.50	2.36	0.46	5.00	1.01	0.00	1.01
54.55	2.36	0.46	5.00	1.01	0.00	1.01
54.60	2.36	0.46	5.00	1.01	0.00	1.01
54.65	2.36	0.46	5.00	1.01	0.00	1.01
54.70	2.36	0.46	5.00	1.01	0.00	1.01
54.75	2.36	0.46	5.00	1.01	0.00	1.01
54.80	2.36	0.46	5.00	1.01	0.00	1.01
54.85	2.36	0.46	5.00	1.01	0.00	1.01
54.90	2.36	0.46	5.00	1.01	0.00	1.01
54.95	2.36	0.46	5.00	1.01	0.00	1.01
55.00	2.36	0.46	5.00	1.01	0.00	1.01

55.05	2.21	0.46	4.82	1.01	0.00	1.01
55.10	2.06	0.46	4.50	1.01	0.00	1.01
55.15	1.92	0.46	4.20	1.01	0.00	1.01
55.20	1.79	0.46	3.91	1.01	0.00	1.01
55.25	1.67	0.46	3.64	1.01	0.00	1.01
55.30	1.55	0.46	3.38	1.01	0.00	1.01
55.35	1.43	0.46	3.13	1.01	0.00	1.01
55.40	1.33	0.46	2.90	1.01	0.00	1.01
55.45	1.23	0.46	2.68	1.01	0.00	1.01
55.50	1.14	0.46	2.51	1.01	0.00	1.01
55.55	1.12	0.46	2.46	1.01	0.00	1.01
55.60	1.11	0.46	2.42	1.01	0.00	1.01
55.65	1.09	0.46	2.38	1.01	0.00	1.01
55.70	1.07	0.46	2.34	1.01	0.00	1.01
55.75	1.05	0.46	2.31	1.01	0.00	1.01
55.80	1.03	0.46	2.27	1.01	0.00	1.01
55.85	1.01	0.45	2.23	1.01	0.00	1.01
55.90	1.00	0.45	2.19	1.01	0.00	1.01
55.95	0.98	0.45	2.16	1.01	0.00	1.01
56.00	0.96	0.45	2.12	1.01	0.00	1.01
56.05	0.95	0.45	2.08	1.01	0.00	1.01
56.10	0.93	0.45	2.05	1.01	0.00	1.01
56.15	0.91	0.45	2.01	1.01	0.00	1.01
56.20	0.90	0.45	1.98	1.01	0.00	1.01
56.25	0.88	0.45	1.94	1.01	0.00	1.01
56.30	0.87	0.45	1.91	1.01	0.00	1.01
56.35	0.85	0.45	1.88	1.01	0.00	1.01
56.40	0.83	0.45	1.84	1.01	0.00	1.01
56.45	0.82	0.45	1.81	1.01	0.00	1.01
56.50	0.80	0.45	1.78	1.01	0.00	1.01
56.55	0.79	0.45	1.74	1.01	0.00	1.01
56.60	0.77	0.45	1.70	1.01	0.00	1.01
56.65	0.75	0.45	1.66	1.01	0.00	-1.01
56.70	0.73	0.45	1.63	1.01	0.00	1.01
56.75	0.72	0.45	1.59	1.01	0.00	1.01
56.80	0.70	0.45	1.56	1.01	0.00	1.01
56.85	0.68	0.45	1.52	1.01	0.00	1.01
56.90	0.67	0.45	1.49	1.00	0.00	1.00
56.95	0.65	0.45	1.45	1.00	0.00	1.00
57.00	0.64	0.45	1.42	1.00	0.00	1.00
57.05	0.62	0.45	1.39	1.00	0.00	1.00
57.10	0.61	0.45	1.35	1.00	0.00	1.00
57.15	0.59	0.45	1.32	1.00	0.00	1.00
57.20	0.58	0.45	1.29	1.00	0.00	1.00
57.25	0.57	0.45	1.26	1.00	0.00	1.00
57.30	0.55	0.45	1.23	1.00	0.00	1.00
57.35	0.54	0.45	1.20	0.99	0.00	0.99
57.40	0.53	0.45	1.18	0.99	0.00	0.99
57.45	0.51	0.45	1.15	0.99	0.00	0.99
57.50	0.51	0.45	1.13	0.99	0.00	0.99
57.55	0.53	0.45	1.18	0.99	0.00	0.99
57.60	0.55	0.45	1.22	0.98	0.00	0.98
57.65	0.57	0.45	1.27	0.98	0.00	0.98
57.70	0.59	0.45	1.32	0.98	0.00	0.98
57.75	0.61	0.45	1.37	0.98	0.00	0.98
57.80	0.63	0.45	1.42	0.98	0.00	0.98
57.85	0.66	0.45	1.47	0.98	0.00	0.98
57.90	0.68	0.45	1.52	0.98	0.00	0.98
57.95	0.70	0.45	1.58	0.98	0.00	0.98
58.00	0.73	0.45	1.63	0.98	0.00	0.98
58.05	0.75	0.44	1.69	0.98	0.00	0.98
58.10	0.78	0.44	1.75	0.98	0.00	0.98
58.15	0.81	0.44	1.81	0.98	0.00	0.98
58.20	0.83	0.44	1.88	0.98	0.00	0.98
58.25	0.86	0.44	1.94	0.98	0.00	0.98
58.30	0.89	0.44	2.01	0.98	0.00	0.98
58.35	0.93	0.44	2.09	0.98	0.00	0.98
58.40	0.96	0.44	2.17	0.98	0.00	0.98
58.45	1.00	0.44	2.25	0.98	0.00	0.98
58.50	1.03	0.44	2.32	0.98	0.00	0.98
58.55	1.03	0.44	2.33	0.98	0.00	0.98
58.60	1.03	0.44	2.34	0.98	0.00	0.98
58.65	1.04	0.44	2.35	0.98	0.00	0.98
58.70	1.05	0.44	2.37	0.98	0.00	0.98
58.75	1.06	0.44	2.40	0.98	0.00	0.98
58.80	1.07	0.44	2.42	0.98	0.00	0.98
58.85	1.08	0.44	2.45	0.98	0.00	0.98
58.90	1.09	0.44	2.47	0.98	0.00	0.98
58.95	1.10	0.44	2.50	0.98	0.00	0.98
59.00	1.11	0.44	2.52	0.98	0.00	0.98
59.05	1.12	0.44	2.55	0.98	0.00	0.98
59.10	1.13	0.44	2.57	0.98	0.00	0.98
59.15	1.14	0.44	2.60	0.98	0.00	0.98
59.20	1.15	0.44	2.62	0.98	0.00	0.98
59.25	1.16	0.44	2.65	0.98	0.00	0.98
59.30	1.18	0.44	2.68	0.98	0.00	0.98
59.35	1.19	0.44	2.70	0.98	0.00	0.98
59.40	1.20	0.44	2.73	0.98	0.00	0.98
59.45	1.21	0.44	2.76	0.98	0.00	0.98
59.50	1.21	0.44	2.77	0.98	0.00	0.98
59.55	1.19	0.44	2.71	0.98	0.00	0.98
59.60	1.16	0.44	2.65	0.98	0.00	0.98
59.65	1.14	0.44	2.60	0.98	0.00	0.98
59.70	1.11	0.44	2.54	0.98	0.00	0.98
59.75	1.09	0.44	2.48	0.98	0.00	0.98
59.80	1.06	0.44	2.43	0.98	0.00	0.98
59.85	1.04	0.44	2.38	0.98	0.00	0.98
59.90	1.01	0.44	2.32	0.98	0.00	0.98
59.95	0.99	0.44	2.27	0.98	0.00	0.98
60.00	0.97	0.44	2.22	0.98	0.00	0.98
60.05	0.95	0.44	2.17	0.98	0.00	0.98
60.10	0.92	0.44	2.12	0.98	0.00	0.98
60.15	0.90	0.44	2.08	0.98	0.00	0.98
60.20	0.88	0.43	2.03	0.98	0.00	0.98
60.25	0.86	0.43	1.98	0.98	0.00	0.98
60.30	0.84	0.43	1.94	0.98	0.00	0.98
60.35	0.82	0.43	1.89	0.98	0.00	0.98
60.40	0.80	0.43	1.85	0.98	0.00	0.98
60.45	0.78	0.43	1.80	0.98	0.00	0.98
60.50	0.77	0.43	1.77	0.98	0.00	0.98
60.55	0.76	0.43	1.76	0.98	0.00	0.98
60.60	0.76	0.43	1.76	0.98	0.00	0.98
60.65	0.76	0.43	1.75	0.98	0.00	0.98
60.70	0.75	0.43	1.75	0.98	0.00	0.98
60.75	0.75	0.43	1.74	0.98	0.00	0.98
60.80	0.75	0.43	1.73	0.98	0.00	0.98
60.85	0.75	0.43	1.73	0.98	0.00	0.98
60.90	0.74	0.43	1.72	0.98	0.00	0.98
60.95	0.74	0.43	1.72	0.98	0.00	0.98
61.00	0.74	0.43	1.71	0.98	0.00	0.98
61.05	0.73	0.43	1.71	0.98	0.00	0.98
61.10	0.73	0.43	1.70	0.98	0.00	0.98
61.15	0.73	0.43	1.69	0.98	0.00	0.98
61.20	0.73	0.43	1.69	0.98	0.00	0.98
61.25	0.72	0.43	1.68	0.98	0.00	0.98
61.30	0.72	0.43	1.68	0.98	0.00	0.98
61.35	0.72	0.43	1.67	0.97	0.00	0.97
61.40	0.72	0.43	1.67	0.97	0.00	0.97
61.45	0.71	0.43	1.66	0.97	0.00	0.97
61.50	0.71	0.43	1.66	0.97	0.00	0.97
61.55	0.71	0.43	1.66	0.97	0.00	0.97
61.60	0.71	0.43	1.67	0.97	0.00	0.97
61.65	0.72	0.43	1.67	0.97	0.00	0.97
61.70	0.72	0.43	1.68	0.97	0.00	0.97
61.75	0.72	0.43	1.68	0.97	0.00	0.97
61.80	0.72	0.43	1.68	0.97	0.00	0.97
61.85	0.72	0.43	1.69	0.97	0.00	0.97
61.90	0.72	0.43	1.69	0.97	0.00	0.97

61.95	0.72	0.43	1.70	0.97	0.00	0.97
62.00	0.73	0.43	1.70	0.97	0.00	0.97
62.05	0.73	0.43	1.71	0.97	0.00	0.97
62.10	0.73	0.43	1.71	0.97	0.00	0.97
62.15	0.73	0.43	1.72	0.97	0.00	0.97
62.20	0.73	0.43	1.72	0.97	0.00	0.97
62.25	0.73	0.43	1.73	0.97	0.00	0.97
62.30	0.74	0.42	1.73	0.97	0.00	0.97
62.35	0.74	0.42	1.74	0.97	0.00	0.97
62.40	0.74	0.42	1.74	0.97	0.00	0.97
62.45	0.74	0.42	1.75	0.97	0.00	0.97
62.50	0.74	0.42	1.74	0.97	0.00	0.97
62.55	0.72	0.42	1.70	0.97	0.00	0.97
62.60	0.71	0.42	1.67	0.97	0.00	0.97
62.65	0.69	0.42	1.63	0.97	0.00	0.97
62.70	0.67	0.42	1.59	0.97	0.00	0.97
62.75	0.66	0.42	1.56	0.97	0.00	0.97
62.80	0.65	0.42	1.54	0.97	0.00	0.97
62.85	0.65	0.42	1.53	0.97	0.00	0.97
62.90	0.64	0.42	1.51	0.97	0.00	0.97
62.95	0.63	0.42	1.50	0.97	0.00	0.97
63.00	0.63	0.42	1.49	0.97	0.00	0.97
63.05	0.62	0.42	1.48	0.97	0.00	0.97
63.10	0.62	0.42	1.46	0.97	0.00	0.97
63.15	0.61	0.42	1.45	0.97	0.00	0.97
63.20	0.61	0.42	1.44	0.97	0.00	0.97
63.25	0.60	0.42	1.43	0.97	0.00	0.97
63.30	0.59	0.42	1.42	0.97	0.00	0.97
63.35	0.59	0.42	1.40	0.97	0.00	0.97
63.40	0.58	0.42	1.39	0.96	0.00	0.96
63.45	0.58	0.42	1.38	0.96	0.00	0.96
63.50	0.57	0.42	1.37	0.96	0.00	0.96
63.55	0.57	0.42	1.36	0.96	0.00	0.96
63.60	0.56	0.42	1.34	0.96	0.00	0.96
63.65	0.56	0.42	1.33	0.96	0.00	0.96
63.70	0.55	0.42	1.31	0.96	0.00	0.96
63.75	0.54	0.42	1.30	0.96	0.00	0.96
63.80	0.54	0.42	1.29	0.96	0.00	0.96
63.85	0.53	0.42	1.27	0.96	0.00	0.96
63.90	0.53	0.42	1.26	0.96	0.00	0.96
63.95	0.52	0.42	1.25	0.96	0.00	0.96
64.00	0.51	0.42	1.23	0.96	0.00	0.96
64.05	0.51	0.42	1.22	0.96	0.00	0.96
64.10	0.50	0.42	1.21	0.95	0.00	0.95
64.15	0.50	0.42	1.19	0.95	0.00	0.95
64.20	0.49	0.42	1.18	0.95	0.00	0.95
64.25	0.49	0.42	1.17	0.95	0.00	0.95
64.30	0.48	0.42	1.16	0.95	0.00	0.95
64.35	0.47	0.42	1.14	0.95	0.00	0.95
64.40	0.47	0.41	1.13	0.94	0.00	0.94
64.45	0.46	0.41	1.12	0.94	0.00	0.94
64.50	0.45	0.41	1.10	0.94	0.00	0.94
64.55	0.43	0.41	1.05	0.94	0.00	0.94
64.60	0.41	0.41	1.00*	0.94	0.00	0.94
64.65	0.39	0.41	0.95*	0.93	0.00	0.93
64.70	0.38	0.41	0.91*	0.93	0.00	0.93
64.75	0.36	0.41	0.87*	0.92	0.00	0.92
64.80	0.34	0.41	0.83*	0.92	0.00	0.92
64.85	0.33	0.41	0.79*	0.91	0.00	0.91
64.90	0.31	0.41	0.76*	0.91	0.00	0.91
64.95	0.30	0.41	0.73*	0.90	0.00	0.90
65.00	0.29	0.41	0.70*	0.89	0.00	0.89
65.05	0.28	0.41	0.67*	0.88	0.00	0.88
65.10	0.27	0.41	0.65*	0.88	0.00	0.88
65.15	0.26	0.41	0.63*	0.87	0.00	0.87
65.20	0.25	0.41	0.61*	0.86	0.00	0.86
65.25	0.24	0.41	0.59*	0.85	0.00	0.85
65.30	0.24	0.41	0.58*	0.84	0.00	0.84
65.35	0.24	0.41	0.58*	0.83	0.00	0.83
65.40	0.24	0.41	0.58*	0.82	0.00	0.82
65.45	0.24	0.41	0.60*	0.81	0.00	0.81
65.50	0.25	0.41	0.62*	0.80	0.00	0.80
65.55	0.25	0.41	0.62*	0.79	0.00	0.79
65.60	0.26	0.41	0.62*	0.79	0.00	0.79
65.65	0.26	0.41	0.63*	0.78	0.00	0.78
65.70	0.26	0.41	0.63*	0.77	0.00	0.77
65.75	0.26	0.41	0.63*	0.76	0.00	0.76
65.80	0.26	0.41	0.64*	0.76	0.00	0.76
65.85	0.26	0.41	0.64*	0.75	0.00	0.75
65.90	0.26	0.41	0.65*	0.74	0.00	0.74
65.95	0.27	0.41	0.65*	0.73	0.00	0.73
66.00	0.27	0.41	0.66*	0.73	0.00	0.73
66.05	0.27	0.41	0.67*	0.72	0.00	0.72
66.10	0.27	0.41	0.68*	0.71	0.00	0.71
66.15	0.28	0.41	0.68*	0.70	0.00	0.70
66.20	0.28	0.41	0.69*	0.70	0.00	0.70
66.25	0.28	0.41	0.70*	0.69	0.00	0.69
66.30	0.29	0.41	0.71*	0.68	0.00	0.68
66.35	0.29	0.41	0.72*	0.68	0.00	0.68
66.40	0.29	0.41	0.73*	0.67	0.00	0.67
66.45	0.30	0.40	0.74*	0.66	0.00	0.66
66.50	0.30	0.40	0.75*	0.66	0.00	0.66
66.55	0.31	0.40	0.76*	0.65	0.00	0.65
66.60	0.31	0.40	0.77*	0.65	0.00	0.65
66.65	0.32	0.40	0.78*	0.64	0.00	0.64
66.70	0.32	0.40	0.80*	0.64	0.00	0.64
66.75	0.33	0.40	0.83*	0.63	0.00	0.63
66.80	0.34	0.40	0.85*	0.63	0.00	0.63
66.85	0.35	0.40	0.88*	0.62	0.00	0.62
66.90	0.37	0.40	0.91*	0.62	0.00	0.62
66.95	0.38	0.40	0.94*	0.61	0.00	0.61
67.00	0.39	0.40	0.97*	0.61	0.00	0.61
67.05	0.40	0.40	1.01	0.61	0.00	0.61
67.10	0.42	0.40	1.05	0.60	0.00	0.60
67.15	0.44	0.40	1.09	0.60	0.00	0.60
67.20	0.45	0.40	1.13	0.60	0.00	0.60
67.25	0.47	0.40	1.17	0.60	0.00	0.60
67.30	0.49	0.40	1.22	0.59	0.00	0.59
67.35	0.51	0.40	1.26	0.59	0.00	0.59
67.40	0.53	0.40	1.31	0.59	0.00	0.59
67.45	0.55	0.40	1.37	0.59	0.00	0.59
67.50	0.57	0.40	1.42	0.59	0.00	0.59
67.55	0.58	0.40	1.44	0.59	0.00	0.59
67.60	0.59	0.40	1.47	0.59	0.00	0.59
67.65	0.60	0.40	1.49	0.59	0.00	0.59
67.70	0.61	0.40	1.52	0.59	0.00	0.59
67.75	0.62	0.40	1.55	0.59	0.00	0.59
67.80	0.63	0.40	1.58	0.59	0.00	0.59
67.85	0.64	0.40	1.61	0.59	0.00	0.59
67.90	0.65	0.40	1.63	0.59	0.00	0.59
67.95	0.66	0.40	1.66	0.59	0.00	0.59
68.00	0.67	0.40	1.69	0.59	0.00	0.59
68.05	0.68	0.40	1.72	0.59	0.00	0.59
68.10	0.70	0.40	1.75	0.59	0.00	0.59
68.15	0.71	0.40	1.78	0.59	0.00	0.59
68.20	0.72	0.40	1.82	0.59	0.00	0.59
68.25	0.73	0.40	1.85	0.59	0.00	0.59
68.30	0.74	0.40	1.88	0.59	0.00	0.59
68.35	0.76	0.40	1.91	0.59	0.00	0.59
68.40	0.77	0.40	1.94	0.59	0.00	0.59
68.45	0.78	0.40	1.98	0.59	0.00	0.59
68.50	0.79	0.39	2.01	0.59	0.00	0.59
68.55	0.80	0.39	2.03	0.59	0.00	0.59
68.60	0.81	0.39	2.05	0.59	0.00	0.59
68.65	0.82	0.39	2.07	0.59	0.00	0.59
68.70	0.83	0.39	2.10	0.59	0.00	0.59
68.75	0.84	0.39	2.14	0.59	0.00	0.59
68.80	0.86	0.39	2.17	0.59	0.00	0.59

68.85	0.87	0.39	2.21	0.59	0.00	0.59
68.90	0.88	0.39	2.25	0.59	0.00	0.59
68.95	0.90	0.39	2.29	0.59	0.00	0.59
69.00	0.91	0.39	2.33	0.59	0.00	0.59
69.05	0.93	0.39	2.37	0.59	0.00	0.59
69.10	0.94	0.39	2.41	0.59	0.00	0.59
69.15	0.96	0.39	2.45	0.59	0.00	0.59
69.20	0.97	0.39	2.49	0.59	0.00	0.59
69.25	0.99	0.39	2.53	0.59	0.00	0.59
69.30	1.00	0.39	2.57	0.59	0.00	0.59
69.35	1.02	0.39	2.61	0.59	0.00	0.59
69.40	1.04	0.39	2.65	0.59	0.00	0.59
69.45	1.05	0.39	2.70	0.59	0.00	0.59
69.50	1.07	0.39	2.73	0.59	0.00	0.59
69.55	1.07	0.39	2.74	0.59	0.00	0.59
69.60	1.07	0.39	2.75	0.59	0.00	0.59
69.65	1.08	0.39	2.76	0.59	0.00	0.59
69.70	1.08	0.39	2.77	0.59	0.00	0.59
69.75	1.08	0.39	2.78	0.59	0.00	0.59
69.80	1.09	0.39	2.79	0.59	0.00	0.59
69.85	1.09	0.39	2.80	0.59	0.00	0.59
69.90	1.09	0.39	2.81	0.59	0.00	0.59
69.95	1.09	0.39	2.82	0.59	0.00	0.59
70.00	1.10	0.39	2.83	0.59	0.00	0.59
70.05	1.10	0.39	2.84	0.59	0.00	0.59
70.10	1.10	0.39	2.85	0.59	0.00	0.59
70.15	1.11	0.39	2.86	0.59	0.00	0.59
70.20	1.11	0.39	2.87	0.59	0.00	0.59
70.25	1.11	0.39	2.88	0.59	0.00	0.59
70.30	1.12	0.39	2.89	0.59	0.00	0.59
70.35	1.12	0.39	2.90	0.59	0.00	0.59
70.40	1.12	0.39	2.91	0.59	0.00	0.59
70.45	1.13	0.39	2.92	0.59	0.00	0.59
70.50	1.13	0.39	2.93	0.59	0.00	0.59
70.55	1.12	0.38	2.90	0.59	0.00	0.59
70.60	1.10	0.38	2.87	0.59	0.00	0.59
70.65	1.09	0.38	2.84	0.59	0.00	0.59
70.70	1.08	0.38	2.81	0.59	0.00	0.59
70.75	1.07	0.38	2.79	0.59	0.00	0.59
70.80	1.06	0.38	2.76	0.59	0.00	0.59
70.85	1.05	0.38	2.73	0.59	0.00	0.59
70.90	1.04	0.38	2.70	0.59	0.00	0.59
70.95	1.02	0.38	2.68	0.59	0.00	0.59
71.00	1.01	0.38	2.65	0.59	0.00	0.59
71.05	1.00	0.38	2.62	0.59	0.00	0.59
71.10	0.99	0.38	2.60	0.59	0.00	0.59
71.15	0.98	0.38	2.57	0.59	0.00	0.59
71.20	0.97	0.38	2.54	0.59	0.00	0.59
71.25	0.96	0.38	2.52	0.59	0.00	0.59
71.30	0.95	0.38	2.49	0.59	0.00	0.59
71.35	0.94	0.38	2.47	0.59	0.00	0.59
71.40	0.93	0.38	2.44	0.59	0.00	0.59
71.45	0.92	0.38	2.42	0.59	0.00	0.59
71.50	0.91	0.38	2.40	0.59	0.00	0.59
71.55	0.92	0.38	2.42	0.59	0.00	0.59
71.60	0.93	0.38	2.44	0.59	0.00	0.59
71.65	0.93	0.38	2.45	0.59	0.00	0.59
71.70	0.94	0.38	2.47	0.59	0.00	0.59
71.75	0.94	0.38	2.49	0.59	0.00	0.59
71.80	0.95	0.38	2.51	0.59	0.00	0.59
71.85	0.96	0.38	2.53	0.59	0.00	0.59
71.90	0.96	0.38	2.55	0.59	0.00	0.59
71.95	0.97	0.38	2.57	0.59	0.00	0.59
72.00	0.98	0.38	2.58	0.59	0.00	0.59
72.05	0.98	0.38	2.60	0.59	0.00	0.59
72.10	0.99	0.38	2.62	0.59	0.00	0.59
72.15	1.00	0.38	2.64	0.59	0.00	0.59
72.20	1.00	0.38	2.66	0.59	0.00	0.59
72.25	1.01	0.38	2.68	0.59	0.00	0.59
72.30	1.02	0.38	2.70	0.59	0.00	0.59
72.35	1.02	0.38	2.72	0.59	0.00	0.59
72.40	1.03	0.38	2.74	0.59	0.00	0.59
72.45	1.04	0.38	2.76	0.59	0.00	0.59
72.50	1.03	0.38	2.74	0.59	0.00	0.59
72.55	0.97	0.38	2.60	0.59	0.00	0.59
72.60	0.92	0.37	2.45	0.59	0.00	0.59
72.65	0.87	0.37	2.32	0.59	0.00	0.59
72.70	0.82	0.37	2.19	0.59	0.00	0.59
72.75	0.77	0.37	2.06	0.59	0.00	0.59
72.80	0.73	0.37	1.95	0.59	0.00	0.59
72.85	0.68	0.37	1.83	0.59	0.00	0.59
72.90	0.64	0.37	1.72	0.59	0.00	0.59
72.95	0.60	0.37	1.62	0.59	0.00	0.59
73.00	0.57	0.37	1.52	0.59	0.00	0.59
73.05	0.53	0.37	1.43	0.58	0.00	0.58
73.10	0.50	0.37	1.34	0.58	0.00	0.58
73.15	0.47	0.37	1.25	0.58	0.00	0.58
73.20	0.44	0.37	1.17	0.58	0.00	0.58
73.25	0.41	0.37	1.10	0.58	0.00	0.58
73.30	0.38	0.37	1.04	0.58	0.00	0.58
73.35	0.37	0.37	0.98*	0.57	0.00	0.57
73.40	0.35	0.37	0.93*	0.57	0.00	0.57
73.45	0.33	0.37	0.89*	0.56	0.00	0.56
73.50	0.31	0.37	0.84*	0.56	0.00	0.56
73.55	0.30	0.37	0.81*	0.55	0.00	0.55
73.60	0.29	0.37	0.77*	0.54	0.00	0.54
73.65	0.27	0.37	0.74*	0.54	0.00	0.54
73.70	0.26	0.37	0.71*	0.53	0.00	0.53
73.75	0.25	0.37	0.68*	0.52	0.00	0.52
73.80	0.24	0.37	0.65*	0.51	0.00	0.51
73.85	0.23	0.37	0.62*	0.49	0.00	0.49
73.90	0.22	0.37	0.60*	0.48	0.00	0.48
73.95	0.21	0.37	0.58*	0.47	0.00	0.47
74.00	0.20	0.37	0.55*	0.46	0.00	0.46
74.05	0.20	0.37	0.53*	0.45	0.00	0.45
74.10	0.19	0.37	0.51*	0.43	0.00	0.43
74.15	0.18	0.37	0.49*	0.42	0.00	0.42
74.20	0.17	0.37	0.47*	0.41	0.00	0.41
74.25	0.17	0.37	0.46*	0.39	0.00	0.39
74.30	0.16	0.37	0.44*	0.38	0.00	0.38
74.35	0.16	0.37	0.43*	0.37	0.00	0.37
74.40	0.15	0.37	0.42*	0.35	0.00	0.35
74.45	0.15	0.37	0.40*	0.34	0.00	0.34
74.50	0.14	0.37	0.39*	0.32	0.00	0.32
74.55	0.14	0.37	0.39*	0.31	0.00	0.31
74.60	0.14	0.36	0.38*	0.30	0.00	0.30
74.65	0.14	0.36	0.38*	0.28	0.00	0.28
74.70	0.14	0.36	0.38*	0.27	0.00	0.27
74.75	0.14	0.36	0.37*	0.25	0.00	0.25
74.80	0.13	0.36	0.37*	0.24	0.00	0.24
74.85	0.13	0.36	0.37*	0.22	0.00	0.22
74.90	0.13	0.36	0.36*	0.20	0.00	0.20
74.95	0.13	0.36	0.36*	0.19	0.00	0.19
75.00	0.13	0.36	0.36*	0.17	0.00	0.17
75.05	0.13	0.36	0.35*	0.16	0.00	0.16
75.10	0.13	0.36	0.35*	0.14	0.00	0.14
75.15	0.13	0.36	0.35*	0.12	0.00	0.12
75.20	0.13	0.36	0.35*	0.11	0.00	0.11
75.25	0.12	0.36	0.34*	0.09	0.00	0.09
75.30	0.12	0.36	0.34*	0.07	0.00	0.07
75.35	0.12	0.36	0.34*	0.05	0.00	0.05
75.40	0.12	0.36	0.34*	0.04	0.00	0.04
75.45	0.12	0.36	0.35*	0.02	0.00	0.02
75.50	2.00	0.36	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Depth = ft, Stress or Pressure = tsf (atm), Unit Weight = pcf, Settlement = in.

CRRm	Cyclic resistance ratio from soils
CSRfs	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRfs
S_sat	Settlement from saturated sands
S_dry	Settlement from dry sands
S_all	Total settlement from saturated and dry sands
NoLiq	No-Liquefy Soils

METHANE
SPECIALISTS

Methane Site Assessment Report

August 23, 2006

Woodfin Suites Hotel
Parcel 9u
Marina Del Rey, CA 90292

J1726

621 VIA ALONDRA SUITE 611 CAMARILLO, CALIFORNIA 93012
805.987.5356 FAX 805.987.3968
METHANESPECIALISTS.COM

INTRODUCTION

This Sampling Summary/Methane Report documents Methane Specialists' environmental sampling/analysis and assessment of the potential presence of methane gas in vadose zone soils at the Proposed Woodfin Hotel site in Marina Del Rey, California. More specifically, the site is located at Via Marina and Tahiti Way.

PROJECT DESCRIPTION

The subject site is bound by Tahiti Way to the South, a paved driveway to the North, Via Marina to the west and the Pacific Ocean to the East. The site is approximately 143,000 square feet (exhibit 1A). Before testing commenced, Methane Specialists obtained a Right of Entry Permit,(see attached permit for details), through the Los Angeles Department of Beaches and Harbors, which explained the situation at the site. Approximately half of the subject site is a protected wetland area which will not be developed. A protected species of plant is present on the site which, according to the site biologist, designates a section of this particular site as a wetland area. This indicator species was not disturbed during the methane investigation and the site biologist was present during all methane investigation activity. Planned development of the site consists of a multi-residential complex to be built over the non-wetland areas.

METHANE ASSESSMENT METHODOLOGY

A description of the field activities performed during environmental sampling/analysis and assessment the presence of methane at the site is provided in the following section. Activities performed include right of entry permit process and acceptance (see attached), meetings with the site biologist, health and safety management, utility clearance, environmental sampling and analysis, soil sample screening, deep soil gas probe set installation, deep soil gas probe set monitoring, and waste handling.

UTILITY CLEARANCE

Methane Specialists marked the boring locations and contacted Underground Service Alert a minimum of 48 hours prior to the initiation of field activities. No utilities were encountered during drilling activities.

WASTE HANDLING

All of the borings installed at the site were advanced using direct push rigs. No soil cuttings were generated at the site.

SOIL GAS PROBE INSTALLATION

Methane Specialists performed a sub-surface soil gas investigation to discover possible methane seepage at the subject site. Methane Specialists installed 5 sub-surface gas monitoring probes,(see exhibit 3-A), throughout the site. The probes were placed on the existing tire tracks from previous workers at the site to minimize disturbance to the site. The probes were set at 5', 10' and 20' below the existing grade. Readings were then recorded from the probes using a handheld RKI Eagle instrument. The instrument was calibrated each day by trained Methane Specialists personnel using manufacturer recommended calibration gas following a procedure authored by the manufacturer of the instrument. The RKI Eagle instrument is capable of detecting methane in concentrations as low as 500ppmv. No further laboratory analysis of the soil gas has been performed at the site.

TEST RESULTS

Analysis of the soil gas probes resulted in methane concentration readings from non-detect to 100% methane (exibit 4A). The source of the high methane concentration readings is believed to be caused by oil wells on and nearby the subject site. The site is adjacent to many abandoned oil wells as well as "wildcat" fields. (Exhibit 5A). A cursory search of known active and abandoned well records according to DOGGR (division of gas and geothermal resources) for the property was conducted which revealed a well on the property. The well is identified as, "County of Los Angeles c/o R.A Del Gu, 'Dow R.G.C.' 10", per DOGGR and Wildcat investigation. The location of the well according to DOGGR Map #120(exhibit 5A) is to the west boundary of the property but, when the longitude and latitude coordinates, (provided by DOGGR on the well locator list attached), were entered into a satellite mapping program, the location of the well shifted to the west side of the subject site(Exhibit 5c). Due to the conflicts of this data, it is recommended that the exact location of the wells on this site are confirmed before the sale of the property is final, due to possible high costs in locating the oil well.

RECOMMENDATIONS

Due to the porous soil conditions at the site and the influence of the oil wells on and around the site with methane concentrations as high as 100%, Methane Specialists proposes engineering of the following systems to properly mitigate the possibility of methane gas infiltrating the proposed buildings on the site. A complete engineering set should be completed and submitted to the County for approval prior to commencement of construction.

All Enclosed Buildings:

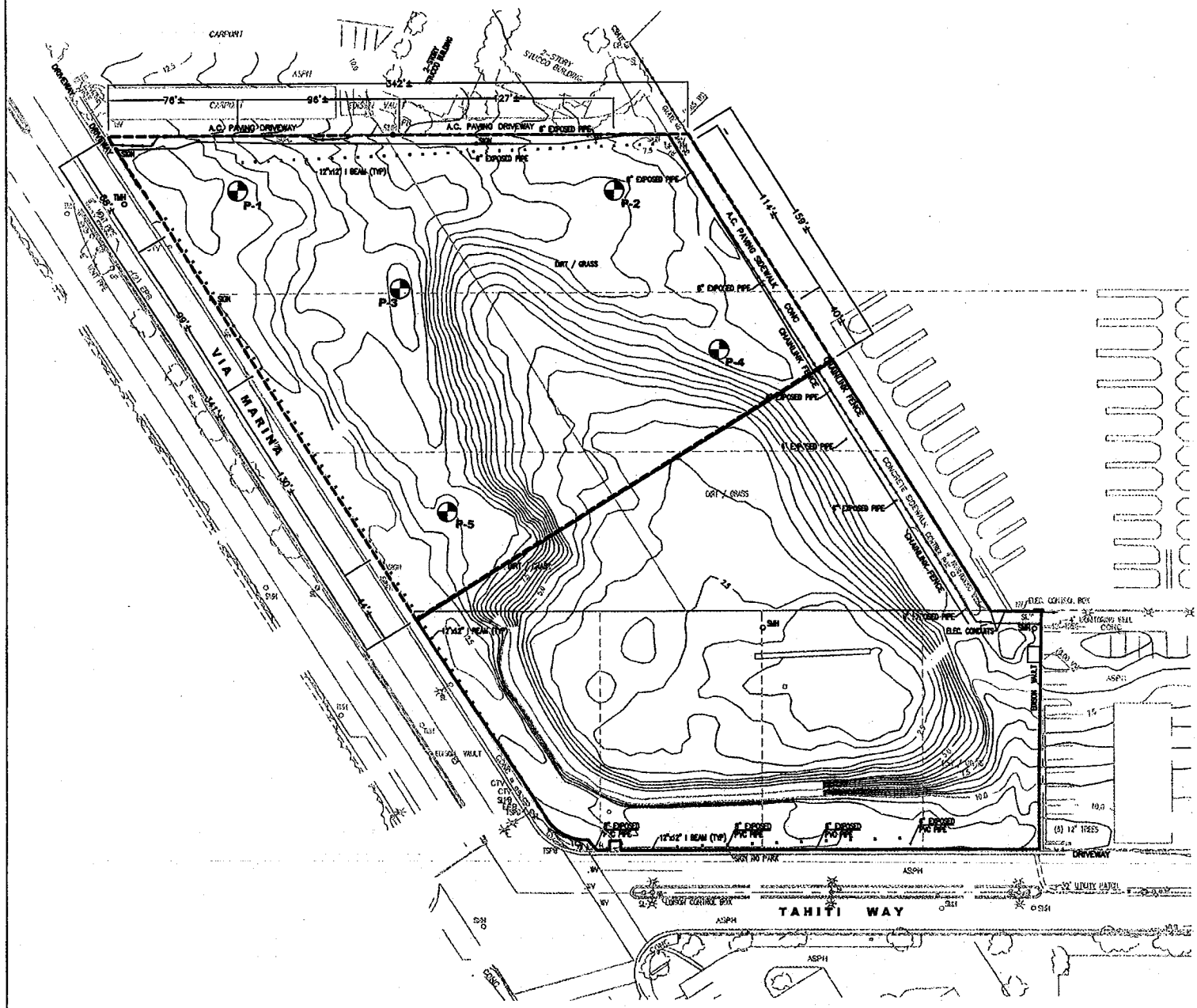
1. A sub-slab venting system consisting of a series of vent pipes in gravel filled trenches leading to vent risers passively venting to the atmosphere.

2. An impervious membrane system installed below the building foundations and above the venting system, with 2" of sand or slurry above and at least 8" of methane gravel surrounding methane gas vent pipes below the membrane.
3. Active ventilation system capable of exchanging the inside air at a rate that would eliminate the possibility of methane concentrating in the building(s).
4. Electrical conduit seal offs and utility trench slurry plugs

CLOSING

This investigation has been performed with the degree of care and skill ordinarily exercised by engineers and consultants practicing in this and similar localities. No other warranty, express or implied is given regarding the opinions, conclusions or recommendations presented in this report. The scope of this report is limited to the specific scope and matter discussed herein. This report is presented for the sole use of Woodfin Suites Hotels and may not be relied on by any other party without express written permission by Methane Specialists. All of the information presented in this report is based on information and conditions present at the time of the investigation and the preparation for the report. Any changes in condition or circumstance may necessitate additional investigation and analysis. Due to the nature of this type of investigation, uncertainty exists as to the condition of the sub-surface conditions that exist between the monitoring well points. If this level uncertainty is unacceptable additional investigation should be performed.

Thank you for the opportunity to provide this report. Should you have any questions please contact Methane S at 805-987-5356.



RIGHT OF ENTRY PERMIT# RE-027-06

EXHIBIT 1-A

NOT TO SCALE

1
A

METHANE SPECIALISTS

621 Via Alondra
Suite 611
Camarillo, CA 93012
Tel: (805) 987-5356
Fax: (805) 987-3968

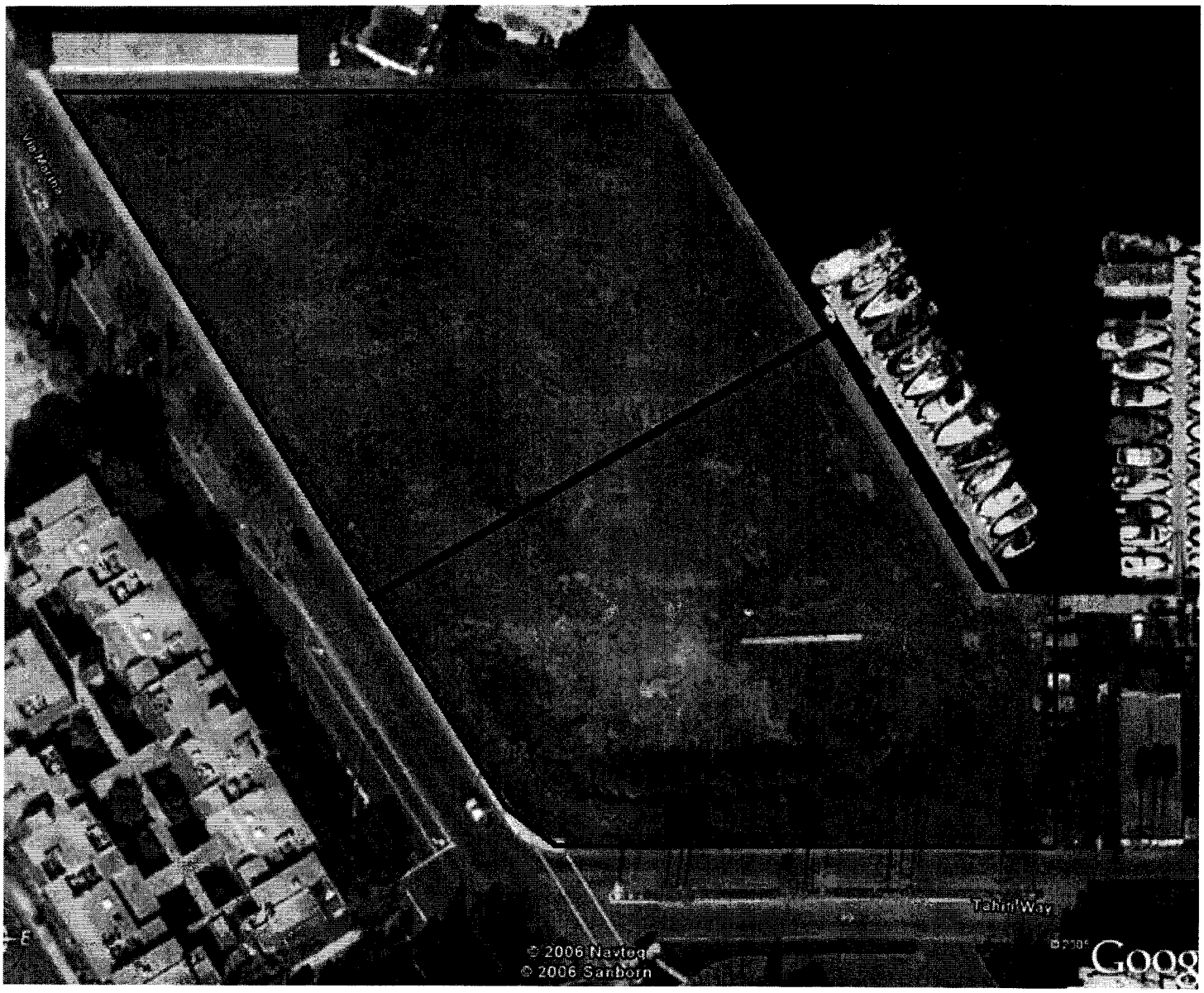
PROPOSED METHANE MONITORING PROBE LOCATIONS

PARCEL 9U
MARINA DEL REY, CA

DATE: JUNE 06'
JOB: J1726
SHEET: 1 OF 1

LEGEND

P-5	PROPOSED BORING LOCATION
———	EXTENTS OF DRILLING AREA
———	PROTECTED WETLAND AREA



N

RIGHT OF ENTRY PERMIT# RE-027-06

EXHIBIT 2-A (AERIAL PHOTOGRAPH)

NOT TO SCALE

2
A

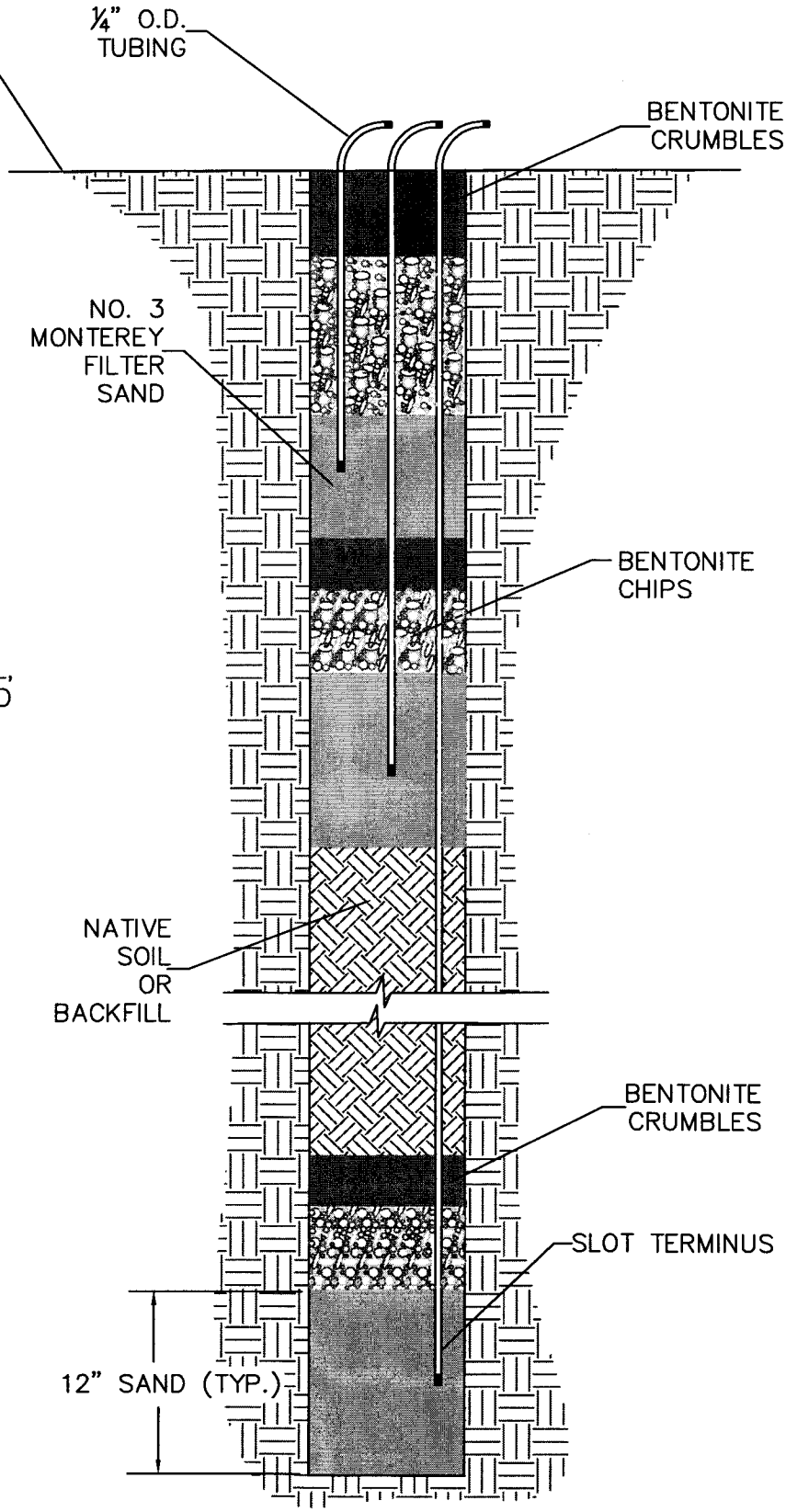
METHANE SPECIALISTS

621 Via Alondra
Suite 611
Camarillo, CA 93012
Tel: (805) 987-5356
Fax: (805) 987-3968

PROPOSED METHANE MONITORING PROBE LOCATIONS

PARCEL 9U
MARINA DEL REY, CA

DATE: AUGUST '06
JOB: J1726
SHEET: 1 OF 1



NOTE:
BORINGS TO BE 20' DEEP, OR 1' ABOVE GROUNDWATER LEVEL, AT 5 PREDETERMINED LOCATIONS.

RIGHT OF ENTRY PERMIT# RE-027-06

EXHIBIT 3-A

NOT TO SCALE

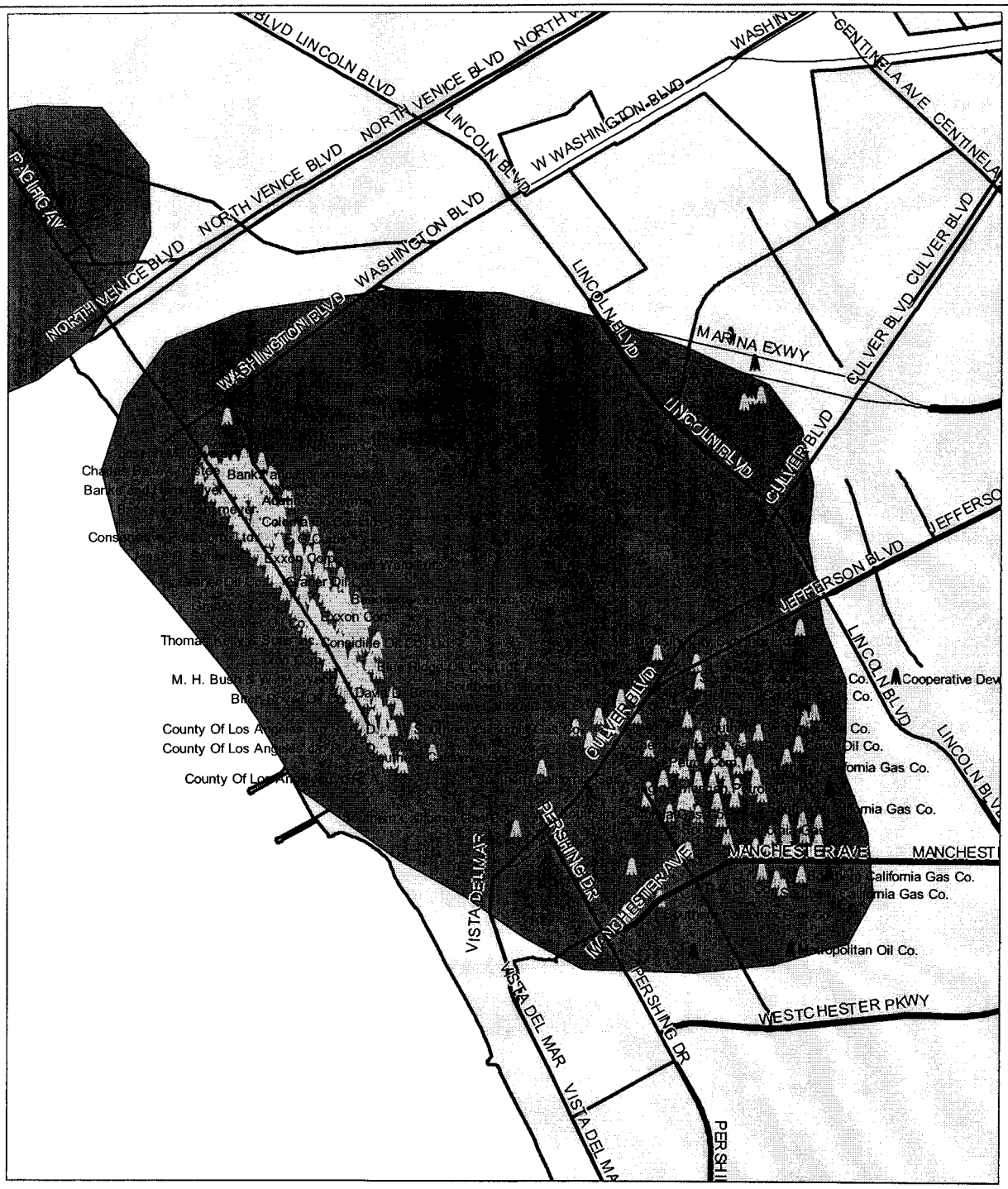
3 A

METHANE SPECIALISTS
621 Via Alondra
Suite 611
Camarillo, CA 93012
Tel: (805) 987-5356
Fax: (805) 987-3968

TYP. INSTALLATION OF TEMPORARY MULTI-STAGE GAS PROBES

PARCEL 9U
MARINA DEL REY, CA

DATE: JUNE 06'
JOB: J1726
SHEET: 1 OF 1



SCALE 1 : 31,651

2,000 0 2,000 4,000 6,000

FEET

N

NOT TO SCALE

METHANE SPECIALISTS
621 Via Alondra
Suite 611
Camarillo, CA 93012
Tel: (805) 987-5356
Fax: (805) 987-3968

PARCEL 9U
MARINA DEL REY, CA

DATE: AUGUST 06'

JOB: J1726

SHEET: 1 OF 1

Los Angeles County Department of Beaches and Harbors

13837 Fiji Way, Marina del Rey, California 90292

Permit No. RE-027-06

Effective Date: **08/01/2006** Expiration Date: **08/02/2006**

Beach/Facility (premises): Parcel 9U (between Marquesas and Tahiti)

Permittee:
Methane Specialists
621 Via Alondra
Camarillo CA, 93012

Telephone: (805) 987-5356
Contact: Chris Tekaat
Emergency: (805) 987-5356

Purpose of Permit:
Five soil borings for methane testing. No work to be done in the designated wetland area. See Exhibit 1-A, 2-A and 3-A.

Equipment to be Used:
Truck, Dumpster, Monitor

Application Date: 06/30/2006

Processing Fee: $150.00
Payments (Type, Term, Amount)

Permit Issued: 07/27/2006

STAN WISNIEWSKI, DIRECTOR

By:
Chief Property Manager
Asset Management Division

THIS PERMIT IS SUBJECT TO THE TERMS AND CONDITIONS LISTED BELOW AND TO THE PROVISIONS LISTED UNDER THE "GENERAL PROVISIONS" SECTION HEREIN

Special Conditions:

A) Permittee, at the termination or expiration of the Permit, shall restore the Premises to the same condition it was at the time Permittee first entered the Premises under this Permit.

B) All drilling, boring, or testing shall take place outside the 25 foot buffer surrounding the wetland area and in the areas depicted on Exhibit A1. Any deviation from the boring and test locations depicted on Exhibit A1 shall subject this permit to immediate termination.

C) Permittee shall fill and patch all drill and boring holes. Any excess debris or dirt shall be removed. All waste material or excess cutting (including those placed in barrels or drums) shall be removed from the Premises at the end of the business day. No barrels shall be stored on the property.

D) Permittee is responsible for any and all damage done to the Premises by Permittee, its agents, its contractors, its subcontractors, its invitees, its visitors, and anyone holding under the Permittee. Permittee shall promptly repair any such damage as soon as Permittee is aware of the

Permittee's Initials: CT

damage and repair shall commence within ten days upon receipt of notification from the County.

E) Permittee shall carry out best management practices to ensure that no hazardous materials shall enter the wetland area or the soils or waters of Marina Del Rey. Permittee shall immediately clean up any hazardous material spills.

F) Permittee shall conform to all CAL OSHA laws and regulations.

G) Permittee hereby warrants and represents that it shall comply with all federal, state, and local laws, and regulations concerning the use, release, storage, and disposal of Hazardous Substances on the Premises.

H) Permittee shall defend, indemnify, and hold County and County's elected and appointed officers, agents, and employees free and harmless from and against any and all Claims (including without limitation, investigation and remediation costs, attorney's fees, legal expenses, expert, and consultants' fees) arising in whole or in part from any release of Hazardous Substances or pollutants or the creation of any Hazardous Substance Condition as such terms may be defined herein or in the Comprehensive Environmental Response Compensation and Liability Act or Resource Conservation and Recovery Act as is now in effect, or as later amended, on the Premises to the extent caused by Permittee, its agents, contractors, employees or assigns.This provision shall survive the termination of this Permit and is intended to comply with the provisions of 42 U.S.C. Section 9607(e).

i) "Hazardous Substance" shall mean any substance whose nature and/or quantity of existence, use, manufacture, disposal, release or effect, render it subject to federal, state, or local regulation, investigation, remediation, or removal as potentially injurious to public health or welfare.

ii) "Hazardous Substance Condition" shall mean the existence on,under, or relevantly adjacent to, the Premises of a Hazardous Substance that required remediation and/orfor it to be otherwise mitigated pursuant to applicable law.

I) Permittee agrees to keep and perform all provisions contained in any permit issued or to be issued to Permittee by any governmental agency or commission. Permittee must be able to demonstrate to the satisfaction of the County that it has obtained and will maintain for the duration of the Permit term all permits necessary for its project or activity, including permits not directly related to the Premises, prior to the effective date of this Permit. Failure to comply with this condition shall constitute a material breach of contract upon which the County may immediately terminate or suspend this Permit.

J) County may terminate this Permit at any time by giving Permittee no less than twenty four (24)hour's advance written notice of intention to terminate. Upon receipt of such notice, Permittee shall vacate the Premises as required herein. Permittee agrees that should it fail to vacate as herein provided, the County or its authorized agents may enter

Permittee's Initials: CT

upon said Premises and remove Permittee's personal property therefrom, and in this event, Permittee waives any and all claims for damages against the County, its officers, agents, or employees. Permittee shall reimburse County for all expenses incurred by County plus maximum interest allowed by law accruing from the day County incurred the expenses until such time as the principal and interest are fully paid by Permittee. Nothing herein shall be deemed a waiver of any rights of County to demand and obtain possession of the Premises in accordance with law in the event Permittee violates any part of any of the terms or conditions herein. K) Permittee shall contact Mark Spiro, Acting District Manager, at (310) 305-9555 in order to arrange access to the Premises.

L) Permittee shall keep the gate to the Premises closed and locked at all times.

M) Permittee shall have a Biologist on site at all times.

General Conditions:

1. Permittee shall notify Underground Service Alert at 1-800-422-4133 at least 48 hours before commencing any excavation necessary to perform the work authorized by this Permit.

2. Working hours shall be 8:00 a.m. to 5:00 p.m. Monday through Friday. No work is allowed on weekends or holidays. All construction areas shall be fenced and secured at the end of the day.

3. Permittee agrees to keep and perform all provisions contained in any permit issued or to be issued to Permittee by any governmental agency or commission. Permittee must be able to demonstrate to the satisfaction of the County that it has obtained and will maintain for the duration of the Permit term all permits necessary for its project or activity, including permits not directly related to the Premises, prior to the effective date of this Permit. Failure to comply with this condition shall constitute a material breach of contract upon which the County may immediately terminate or suspend this Permit.

4. Permittee agrees to keep all advertising signs and marketing material off the Premises, other than signs displaying the name of Permittee and temporary signs to keep out public from the work site, unless prior written approval of the Director of the Department of Beaches and Harbors is obtained. Signs securing the work site must include Permittee's name and a contact telephone number. Said sign(s) shall be for public inquiries and complaints only; no advertising will be allowed.

5. Permittee agrees to conduct the permitted activities in a courteous and non-profane manner, operate without interfering with the use of the Premises by the County or the public, except as herein permitted, and remove any agent, servant or employee who fails to conduct permitted activities in the manner heretofore described.

Permittee's Initials: CT

6. Permittee agrees to conduct the permitted activities in a courteous and non-profane manner, operate without interfering with the use of the Premises by the Department or the public, except as herein permitted, and remove any agent, servant or employee who fails to conduct permitted activities in the manner heretofore described.

7. Permittee acknowledges that this Permit is issued by County of Los Angeles to Permittee for the intended activities and is not intended, and shall not be construed to create the relationship of agent, servant, employee, partnership, joint venture, or association, as between County and Permittee. It is expressly understood by Permittee that in permitting the right to use the premises, no estate or interest in real property is being conveyed to Permittee, and that the right to use is only a nonexclusive, revocable and unassignable permission to occupy the Premises in accordance with the terms and conditions of the Permit for the purpose of conducting the permitted activities.

8. Permittee has examined the premises and knows the conditions thereof. Permittee accepts the premises in the present state and condition and waives any and all demand upon County for alteration, repair, or improvement thereof. Permittee shall make no alteration or improvements to the premises without prior written approval from the County. Permittee shall arrange for and bear the cost of any other permits required by Federal, State or local law, site preparation, installation of utilities, treatment of surface, enclosure of Premises, insurance premiums, utility bills, and other costs of any nature whatsoever, which are necessary in connection with or appurtenant to the operation and maintenance of Premises as used by Permittee. County will allow no credit for the cost of any such expenditure, work performed, or ordered done by Permitt ee.

9. It is understood and agreed to be part of the herein consideration that County may temporarily suspend or terminate the Permit without notice to Permittee in order to allow the performance by County, its officers, agents, and employees, of work necessary to protect persons or property, including the Premises, from impending danger, hazard, or harm.

10. Permittee shall keep Premises and any improvements it constructed or placed on the Premises in good working order and maintain such in a neat, clean, and orderly condition at all times during occupancy and not permit graffiti, rubbish, tin cans, garbage, etc., to accumulate, nor to use or allow use of Premises for any illegal or unauthorized purposes, and to comply with all State laws and local ordinances concerning Premises and the use thereof.

11. It is understood and agreed that County shall not be responsible for any damage to Premises or injuries to persons that may arise from or be incidental to the use and occupancy of Premises, or for damages to the property of Permittee, or for injuries to the person of Permittee, Permittee's agents, servants, successors, subtenants, invites or others

Permittee's Initials: CT

who may be on Premises at anyone's invitation, arising from or incidental to the use of Premises by the Permittee or anyone under the Permittee, and/or its agents, contractors, employees or assigns. Permittee agrees to indemnify, defend, and hold harmless the County for such claims and liability pursuant to the condition immediately below.

12. Permittee shall indemnify, defend, and hold harmless County, its Special Districts, elected and appointed officers, employees and agents from and against any and all liability, including but not limited to demands, claims, actions, fees, costs and expenses (including attorney and expert witness fees), arising from or caused by, in whole or in part, the activities of Permittee, its agents, contractors, employees or assigns on the Premises.

13. This permit shall cancel and terminate any prior oral or written agreement, if any, between County and Permittee for use of the Premises, as of the commencement date of this Permit.

14. Without limiting Permittee's indemnification of the County, Permittee shall at its own expense take out and maintain in force, at all times during the term of this Permit, a policy or policies of insurance covering Premises. Such insurance shall be provided by insurer(s) satisfactory to the County Risk Manager. At a minimum, the policy shall meet the following minimum criteria:

- Coverage for comprehensive general liability and property damage in the amount not less than One Million Dollars ($1,000,000) per occurrence, Two Million Dollars ($2,000,000) aggregate.
- Coverage for automobile liability in the amount not less than One Million Dollars ($1,000,000) per occurrence.
- The COUNTY OF LOS ANGELES, its governing board, officers, and employees shall be named as Additional Insured on all policies of liability insurance to be evidenced by an endorsement or similar instrument. (If County is not named as an Additional Insured in the original policy, an endorsement will be necessary to satisfy this provision.)
- This Permit No. RE-027-06 is included as part of the insured premises to be evidenced by an endorsement or a similar instrument. (If the Premises or this Permit is not named as an Additional Insured in the original policy, an endorsement will be necessary to satisfy this provision.)
- Coverage for Worker's Compensation insurance in an amount and form to meet all applicable requirements of the Labor Code of the State of California and which specifically covers the persons and risks involved in this Permit. Permittee understands and agrees that all persons furnishing services to the County pursuant to this Permit are, for purposes of Worker's Compensation liability, employees solely of Permittee and not of County. Permittee shall bear the sole responsibility and liability for furnishing Worker's

Permittee's Initials: CT

Compensation benefits to any person for injuries arising from or connected with services performed on behalf of Permittee pursuant to this Permit.

All policies of insurance shall be with a company or companies authorized by law to transact insurance business in the State of California. Prior to the commencement date of this Permit, Permittee shall furnish to County a copy of the policy of insurance evidencing Permittee's insurance coverage.

Failure on the part of Permittee to procure or maintain required insurance shall constitute a material breach of contract upon which the County may immediately terminate this Permit.

Upon renewal of any of the policies of insurance, Permittee shall furnish to County a Certificate of Insurance evidencing Permittee's continued insurance coverage. The County shall be given notice in writing at least thirty (30) days in advance of cancellation or modification of such policy.

In the event any of the policies are changed or if the insurance carrier is changed, Permittee shall provide County a copy of the replacement policy meeting the minimum requirements as above noted.

15. Permittee shall not construct or place any improvements on the Premises.

16. County may, at its sole discretion, enter Premises to conduct Environmental Site Assessments. Upon review of such Assessements, County may, at its sole discretion, terminate this Permit consistent with the general provisions herein. Permittee shall bear any and all responsibility, expense, and liability incurred in the cleanup and treatment of any hazardous materials or condition found on the Premises caused by Permittee's use, storage, or treatment of any hazardous materials on/or within the Premises.

17. Each County Lobbyist as defined in Los Angeles County Code Section 2.160.010, retained by Permittee, shall fully comply with the County Lobbyist Ordinance, Los Angeles County Code Chapter 2.160. Failure on the part of any Lobbyist retained by Permittee to fully comply with the County Lobbyist Ordinance, shall constitute a material breach of this Permit upon which the County may terminate or suspend this Permit.

Permittee's Initials: CT

ACCEPTANCE

We, the undersigned Permittee, have read, understood and agreed to all the terms, conditions and restrictions contained in this permit.

WARNING: COMPLETION OF AN APPLICATION CONFERS NO PRIVILEGES UPON THE APPLICANT. DO NOT ATTEMPT TO ENTER OR USE THE PROPERTY UNTIL YOU HAVE RECEIVED A FULLY EXECUTED PERMIT. ANY ATTEMPT TO ENTER OR USE THE PREMISES MAY CAUSE YOUR APPLICATION TO BE REJECTED AND MAY SUBJECT YOU TO CIVIL OR CRIMINAL PROSECUTION.

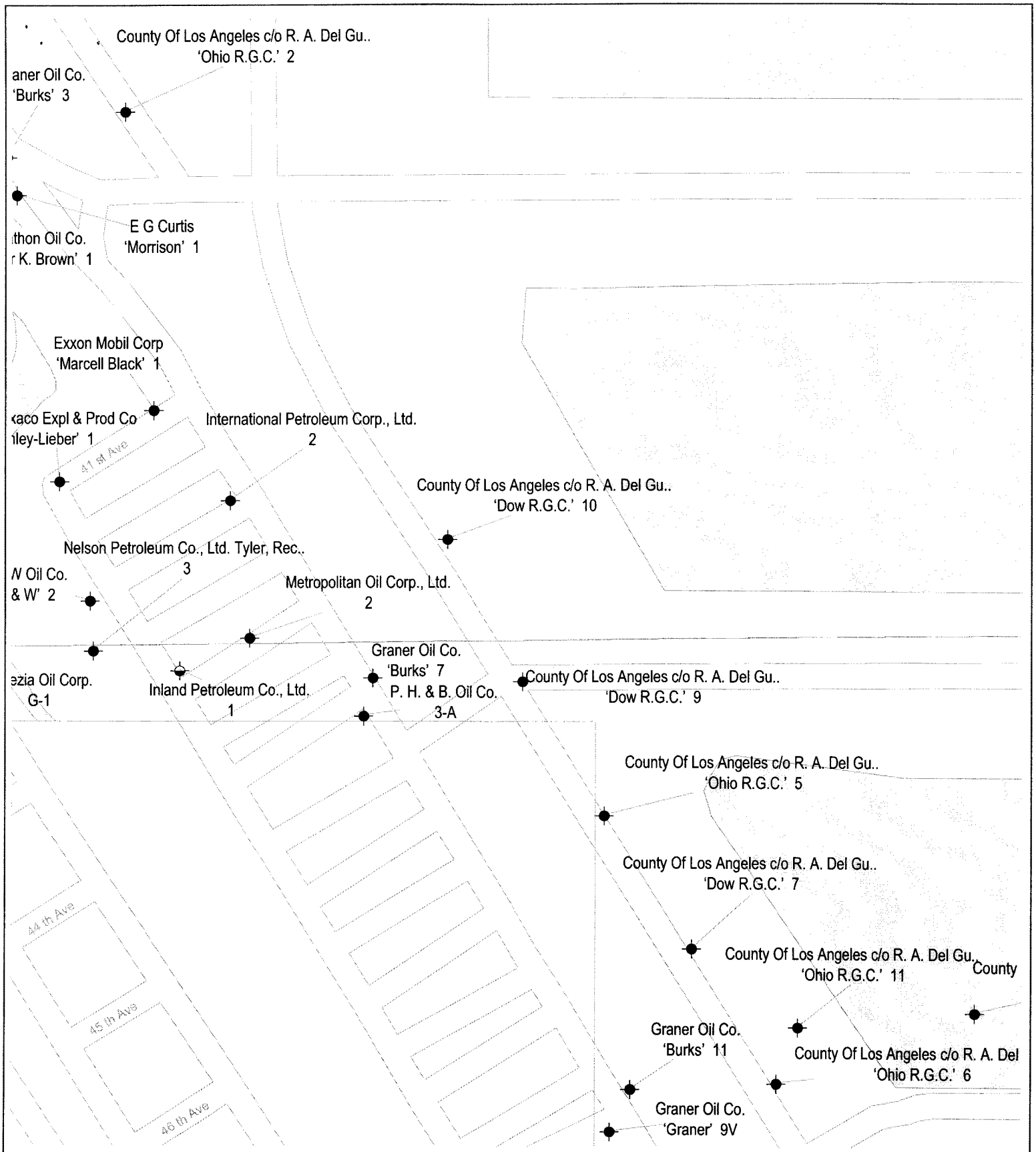
PERMITTEE: Methane Specialists

Signature: Chris Tekaat

Print Name: CHRIS TEKAAT

Title: MANAGER

Date: 7/28/06



METHANE SPECIALISTS
621 Via Alondra
Suite 611
Camarillo, CA 93012
Tel: (805) 987-5356
Fax: (805) 987-3968

PARCEL 9U
MARINA DEL REY, CA

DATE: AUGUST 06'
JOB: J1726
SHEET: 1 OF 1

EXHIBIT 4-A

Site Address: Woodfin Suites-Parcel 9U, Marina Del Rey, CA 90292 Job No. J1726

Instrument Name and Model: RKI Eagle **Instrument Accuracy:** 500 ppmv.

Date	Time	Probe Set #	Concentration (ppmv)	Pressure (inches of water column)	Probe Depth (feet)	COMMENTS:		
08.01.2006	11:15	P-1	ND	<.1	20			
08.01.2006	11:20	P-1	ND	<.1	10			
08.01.2006	11:23	P-1	ND	<.1	5			
08.01.2006	11:45	P-2	1500	<.1	20			
08.01.2006	11:48	P-2	ND	<.1	10			
08.01.2006	11:50	P-2	ND	<.1	5			
08.01.2006	11:30	P-3	LOW FLOW	<.1	20	ENCOUNTERED GROUNDWATER DUE TO RISING TIDE		
08.01.2006	11:35	P-3	170,000	<.1	10			
08.01.2006	11:38	P-3	500	<.1	5			
08.01.2006	11:55	P-4	LOW FLOW	<.1	20	ENCOUNTERED GROUNDWATER DUE TO RISING TIDE		
08.01.2006	12:00	P-4	250,000	<.1	10			
08.01.2006	12:03	P-4	1500	<.1	5			
08.01.2006	11:00	P-5	300,000	<.1	20			
08.01.2006	11:05	P-5	480,000	<.1	10			
08.01.2006	11:08	P-5	420,000	<.1	5			
08.02.2006	11:30	P-1	500	<.1	20			
08.02.2006	11:35	P-1	ND	<.1	10			
08.02.2006	11:38	P-1	ND	<.1	5			
08.02.2006	11:40	P-2	LOW FLOW	<.1	20	ENCOUNTERED GROUNDWATER DUE TO RISING TIDE		
08.02.2006	11:45	P-2	40,000	<.1	10			
08.02.2006	11:48	P-2	20,000	<.1	5			
08.02.2006	11:55	P-3	LOW FLOW	<.1	20	ENCOUNTERED GROUNDWATER DUE TO RISING TIDE		
08.02.2006	12:00	P-3	120,000	<.1	10			
08.02.2006	12:03	P-3	10,000	<.1	5			
08.02.2006	12:05	P-4	LOW FLOW	<.1	20	ENCOUNTERED GROUNDWATER DUE TO RISING TIDE		
08.02.2006	12:10	P-4	150,000	<.1	10			
08.02.2006	12:13	P-4	5,000	<.1	5			
08.02.2006	12:20	P-5	1,000,000	<.1	20			
08.02.2006	12:25	P-5	1,000,000	<.1	10			
08.02.2006	12:28	P-5	400,000	<.1	5			

Test Data - Shallow Soil Gas Test and Gas Probe Test

Site Address: WOODFIN SUITES **Job No.** J1726

Instrument Name and Model: RKI Eagle **Instrument Accuracy:** 500 ppmv.

Date	Time	Probe Set #	Concentration (ppmv)	Pressure (inches of water column)	Probe Depth (feet)	COMMENTS:		
8/1/06	11:15	P-1	ND	<.1	20			
	11:20		ND	<.1	10			
	11:23		ND	<.1	5			
8/1/06	11:45	P-2	1500	<.1	20			
	11:48		ND	<.1	10			
	11:50		ND	<.1	5			
8/1/06	11:30	P-3	LOW FLOW	<.1	20			
	11:35		170,000	<.1	10			
	11:38		500	<.1	5			
8/1/06	11:55	P-4	LOW FLOW	<.1	20			
	12:00			<.1	10			
	12:03			<.1	5			
8/1/06	11:00	P-5	300,000	<.1	20			
	11:05		480,000	<.1	10			
	11:08		420,000	<.1	5			
8/2/06	11:30	P-1	500	<.1	20			
	11:35		ND	<.1	10			
	11:38		ND	<.1	5			
8/2/06	11:40	P-2	LOW FLOW	<.1	20			
	11:45		40,000	<.1	10			
	11:48		20,000	<.1	5			
8/2/06	11:55	P-3	LOW FLOW	<.1	20			
	12:00		120,000	<.1	10			
	12:03		10,000	<.1	5			
8/2/06	12:05	P-4	LOW FLOW	<.1	20			
	12:10		150,000	<.1	10			
	12:13		5,000	<.1	5			
8/2/06	12:20	P-5	1,000,000	<.1	20			
	12:25		1,000,000	<.1	10			
	12:28		400,000	<.1	5			

Apinumber	Operator	Lease	Well_no	Field	Area
03713385	E G Curtis	Jones & Prentiss	1	PLAYA DEL REY	
03713386	E G Curtis	Morrison	1	PLAYA DEL REY	
03714238	E. A. Hall		1	PLAYA DEL REY	
03713396	Eagle Oil & Varnish Co.		1	PLAYA DEL REY	
03713397	El Jemaro Oil Co.		1	PLAYA DEL REY	
03714239	Estate of Hampton & Co., Inc. Bank		1	PLAYA DEL REY	
03713770	Exxon Mobil Corp	Black Gold	1	PLAYA DEL REY	
03713773	Exxon Mobil Corp	Capp	1	PLAYA DEL REY	
03713771	Exxon Mobil Corp	Marcell Black	1	PLAYA DEL REY	
03713777	Exxon Mobil Corp	Robertson	1	PLAYA DEL REY	
03713778	Exxon Mobil Corp	San Vicente	1	PLAYA DEL REY	
03714097	George Wolfe	Wolfe	1	PLAYA DEL REY	
03714205	Goldsmith Bros. Inc. Ltd.		1	PLAYA DEL REY	
03714215	Graner Oil Co.	Burks	1	PLAYA DEL REY	
03714237	H. L. J. Oil Co., Ltd.		1	PLAYA DEL REY	
03713779	Imperial Gypsum & Oil Corp.	Playa Del Rey	1	PLAYA DEL REY	
03714338	J. W. Bonneville	Grafton	1	PLAYA DEL REY	
03714082	J. W. Todd Oil Co., Ltd.		1	PLAYA DEL REY	
03713391	John B. De Maria, Jr.		1	PLAYA DEL REY	
03713393	Joseph M. Devere	Baby Jo	1	PLAYA DEL REY	
03713783	Kashm Oil Corp., Inc.		1	PLAYA DEL REY	
03713789	Knight Oil Co.		1	PLAYA DEL REY	
03713791	La Bara Oil Co. (R. B. Seymour, Tru	Strain	1	PLAYA DEL REY	
03713839	Marathon Oil Co.	Edgar K. Brown	1	PLAYA DEL REY	
03713841	McDonald Petroleum, Ltd.	Mcdonald	1	PLAYA DEL REY	
03713844	Metropolitan Oil Corp., Ltd.		1	PLAYA DEL REY	
03713850	Mohawk Petroleum Co.	Tuttle	1	PLAYA DEL REY	
03713952	P. H. & B. Oil Co.		1	PLAYA DEL REY	
03713394	Paul J. Donavan & E. L. Brace		1	PLAYA DEL REY	
03713979	Rockwell & Hansmeyer		1	PLAYA DEL REY	
03714077	Speedway Oil Co., Ltd.	Bradley King	1	PLAYA DEL REY	
03714350	ChevronTexaco	Stanley-Lieber	1	PLAYA DEL REY	
03714199	ChevronTexaco	V	1	PLAYA DEL REY	
03714085	Twin Buttes Oil Corp. Ltd.	Burns	1	PLAYA DEL REY	
03714086	United States Oil & Royalties Co.	Joann	1	PLAYA DEL REY	
03714088	Venice Oil Synd. No.1		1	PLAYA DEL REY	
03714317	Acme Royalties Ltd.		1	PLAYA DEL REY	
03713848	Alfred D. Mitchell	Booth	1	PLAYA DEL REY	
03714319	Allied Petroleum Corp.	Rawco-Woodford	1	PLAYA DEL REY	
03713798	County Of Los Angeles c/o R. A. De	Dow R.G.C.	10	PLAYA DEL REY	
03714246	Venezia Oil Corp.		11	PLAYA DEL REY	
03713961	P. H. & B. Oil Co.		13B	PLAYA DEL REY	
03713962	P. H. & B. Oil Co.		14-A	PLAYA DEL REY	
03714247	Venezia Oil Corp.		15	PLAYA DEL REY	
03713825	County Of Los Angeles c/o R. A. De	P. H. & B.	17	PLAYA DEL REY	
03714348	Coloma Oil Co., Ltd.	Coloma	2	PLAYA DEL REY	
03713380	Corrigan Petroleum Corp., Ltd.	Babe Allison	2	PLAYA DEL REY	
03713803	County Of Los Angeles c/o R. A. De	Ohio Dickinson	2	PLAYA DEL REY	
03713806	County Of Los Angeles c/o R. A. De	Ohio R.G.C.	2	PLAYA DEL REY	
03713383	E G Curtis	Deuel	2	PLAYA DEL REY	
03713977	George W. Rankin		2	PLAYA DEL REY	
03714236	Graner Oil Co.	Jones & Prentiss	2	PLAYA DEL REY	
03713781	International Petroleum Corp., Ltd.		2	PLAYA DEL REY	
03713983	Jesse R. Schones	Schones	2	PLAYA DEL REY	
03713788	Knickerbocker Oil Co., Ltd.		2	PLAYA DEL REY	
03713838	M. C. R. R. Co., Ltd.	M.C.R.R.	2	PLAYA DEL REY	
03713842	McDonald Petroleum, Ltd.	Mcdonald	2	PLAYA DEL REY	
03713845	Metropolitan Oil Corp., Ltd.		2	PLAYA DEL REY	
03713964	P & W Oil Co.	P & W	2	PLAYA DEL REY	

Map	Status_cod	Source	Latitude	Longitude	Td	Sec	Twr	Rge	Br	X_coord	Y_coord	Zone
120	014	hud	33.975163000	-118.460315000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976385000	-118.459790000	0	21	2S	15W	SE	0	0	
120	014	hud	33.977896000	-118.462560000	6,274	21	2S	15W	SE	0	0	
120	014	hud	33.977661000	-118.463066000	0	21	2S	15W	SE	0	0	
120	006	hud	33.976182000	-118.461510000	5,907	21	2S	15W	SE	0	0	
120	014	hud	33.977818000	-118.464425000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974259000	-118.461406000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974857000	-118.461266000	0	21	2S	15W	SE	0	0	
120	014	hud	33.975242000	-118.458904000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976098000	-118.463462000	0	21	2S	15W	SE	0	0	
120	014	hud	33.975354000	-118.462388000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976901000	-118.462540000	0	21	2S	15W	SE	0	0	
120	006	hud	33.978026000	-118.461985000	6,074	21	2S	15W	SE	0	0	
120	014	hud	33.977932000	-118.460986000	0	21	2S	15W	SE	0	0	
120	006	hud	33.977085000	-118.462699000	6,148	21	2S	15W	SE	0	0	
120	006	hud	33.976263000	-118.461375000	6,282	21	2S	15W	SE	0	0	
120	014	hud	33.978031000	-118.464009000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974772000	-118.461930000	0	21	2S	15W	SE	0	0	
120	014	hud	33.977691000	-118.461610000	0	21	2S	15W	SE	0	0	
120	014	hud	33.978057000	-118.462896000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976117000	-118.463035000	0	21	2S	15W	SE	0	0	
120	006	hud	33.976853000	-118.463399000	6,150	21	2S	15W	SE	0	0	
120	014	hud	33.976309000	-118.463607000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976439000	-118.460048000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976978000	-118.461013000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976749000	-118.462384000	0	21	2S	15W	SE	0	0	
120	014	hud	33.978519000	-118.464440000	0	21	2S	15W	SE	0	0	
120	014	hud	33.978227000	-118.462037000	0	21	2S	15W	SE	0	0	
120	006	hud	33.977338000	-118.461486000	6,214	21	2S	15W	SE	0	0	
120	014	hud	33.977522000	-118.462569000	0	21	2S	15W	SE	0	0	
120	006	hud	33.977483000	-118.464772000	4,093	21	2S	15W	SE	0	0	
120	014	hud	33.974862000	-118.459513000	0	21	2S	15W	SE	0	0	
120	014	hud	33.977391000	-118.460662000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976997000	-118.461722000	0	21	2S	15W	SE	0	0	
120	006	hud	33.975895000	-118.461333000	6,118	21	2S	15W	SE	0	0	
120	014	hud	33.975667000	-118.461138000	0	21	2S	15W	SE	0	0	
120	006	hud	33.977943000	-118.464219000	5,497	21	2S	15W	SE	0	0	
120	014	hud	33.977517000	-118.462169000	0	21	2S	15W	SE	0	0	
120	014	hud	33.975979000	-118.460678000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974551000	-118.457006000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974957000	-118.462559000	0	21	2S	15W	SE	0	0	
120	014	hud	33.975985000	-118.463269000	0	21	2S	15W	SE	0	0	
120	014	hud	33.975260000	-118.462662000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974865000	-118.462498000	0	21	2S	15W	SE	0	0	
120	014	hud	33.978188000	-118.461384000	0	21	2S	15W	SE	0	0	
120	014	hud	33.975090000	-118.462170000	0	21	2S	15W	SE	0	0	
120	006	hud	33.977236000	-118.462365000	5,398	21	2S	15W	SE	0	0	
120	014	hud	33.978692000	-118.461447000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976833000	-118.459091000	0	21	2S	15W	SE	0	0	
120	014	hud	33.978077000	-118.461165000	0	21	2S	15W	SE	0	0	
120	006	hud	33.976957000	-118.462179000	4,257	21	2S	15W	SE	0	0	
120	014	hud	33.974434000	-118.460389000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974760000	-118.458413000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974385000	-118.462028000	0	21	2S	15W	SE	0	0	
120	006	hud	33.977240000	-118.463311000	3,917	21	2S	15W	SE	0	0	
120	006	hud	33.976013000	-118.461001000	6,143	21	2S	15W	SE	0	0	
120	014	hud	33.975686000	-118.460446000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974029000	-118.458288000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974226000	-118.459312000	0	21	2S	15W	SE	0	0	

Apinumber	Operator	Lease	Well_no	Field	Area
03713385	E G Curtis	Jones & Prentiss	1	PLAYA DEL REY	
03713386	E G Curtis	Morrison	1	PLAYA DEL REY	
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03713773	Exxon Mobil Corp	Capp	1	PLAYA DEL REY	
03713771	Exxon Mobil Corp	Marcell Black	1	PLAYA DEL REY	
03713777	Exxon Mobil Corp	Robertson	1	PLAYA DEL REY	
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03714237	H. L. J. Oil Co., Ltd.		1	PLAYA DEL REY	
03713779	Imperial Gypsum & Oil Corp.	Playa Del Rey	1	PLAYA DEL REY	
03714338	J. W. Bonneville	Grafton	1	PLAYA DEL REY	
03714082	J. W. Todd Oil Co., Ltd.		1	PLAYA DEL REY	
03713391	John B. De Maria, Jr.		1	PLAYA DEL REY	
03713393	Joseph M. Devere	Baby Jo	1	PLAYA DEL REY	
03713783	Kashm Oil Corp., Inc.		1	PLAYA DEL REY	
03713789	Knight Oil Co.		1	PLAYA DEL REY	
03713791	La Bara Oil Co. (R. B. Seymour, Tru	Strain	1	PLAYA DEL REY	
03713839	Marathon Oil Co.	Edgar K. Brown	1	PLAYA DEL REY	
03713841	McDonald Petroleum, Ltd.	Mcdonald	1	PLAYA DEL REY	
03713844	Metropolitan Oil Corp., Ltd.		1	PLAYA DEL REY	
03713850	Mohawk Petroleum Co.	Tuttle	1	PLAYA DEL REY	
03713952	P. H. & B. Oil Co.		1	PLAYA DEL REY	
03713394	Paul J. Donavan & E. L. Brace		1	PLAYA DEL REY	
03713979	Rockwell & Hansmeyer		1	PLAYA DEL REY	
03714077	Speedway Oil Co., Ltd.	Bradley King	1	PLAYA DEL REY	
03714350	ChevronTexaco	Stanley-Lieber	1	PLAYA DEL REY	
03714199	ChevronTexaco	V	1	PLAYA DEL REY	
03714085	Twin Buttes Oil Corp. Ltd.	Burns	1	PLAYA DEL REY	
03714086	United States Oil & Royalties Co.	Joann	1	PLAYA DEL REY	
03714088	Venice Oil Synd. No.1		1	PLAYA DEL REY	
03714317	Acme Royalties Ltd.		1	PLAYA DEL REY	
03713848	Alfred D. Mitchell	Booth	1	PLAYA DEL REY	
03714319	Allied Petroleum Corp.	Rawco-Woodford	1	PLAYA DEL REY	
03713798	County Of Los Angeles c/o R. A. De	Dow R.G.C.	10	PLAYA DEL REY	
03714246	Venezia Oil Corp.		11	PLAYA DEL REY	
03713961	P. H. & B. Oil Co.		13B	PLAYA DEL REY	
03713962	P. H. & B. Oil Co.		14-A	PLAYA DEL REY	
03714247	Venezia Oil Corp.		15	PLAYA DEL REY	
03713825	County Of Los Angeles c/o R. A. De	P. H. & B.	17	PLAYA DEL REY	
03714348	Coloma Oil Co., Ltd.	Coloma	2	PLAYA DEL REY	
03713380	Corrigan Petroleum Corp., Ltd.	Babe Allison	2	PLAYA DEL REY	
03713803	County Of Los Angeles c/o R. A. De	Ohio Dickinson	2	PLAYA DEL REY	
03713806	County Of Los Angeles c/o R. A. De	Ohio R.G.C.	2	PLAYA DEL REY	
03713383	E G Curtis	Deuel	2	PLAYA DEL REY	
03713977	George W. Rankin		2	PLAYA DEL REY	
03714236	Graner Oil Co.	Jones & Prentiss	2	PLAYA DEL REY	
03713781	International Petroleum Corp., Ltd.		2	PLAYA DEL REY	
03713983	Jesse R. Schones	Schones	2	PLAYA DEL REY	
03713788	Knickerbocker Oil Co., Ltd.		2	PLAYA DEL REY	
03713838	M. C. R. R. Co., Ltd.	M.C.R.R.	2	PLAYA DEL REY	
03713842	McDonald Petroleum, Ltd.	Mcdonald	2	PLAYA DEL REY	
03713845	Metropolitan Oil Corp., Ltd.		2	PLAYA DEL REY	
03713964	P & W Oil Co.	P & W	2	PLAYA DEL REY	

Map	Status_cod	Source	Latitude	Longitude	Td	Sec	Twr	Rge	Br	X_coord	Y_coord	Zone
120	014	hud	33.975163000	-118.460315000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976385000	-118.459790000	0	21	2S	15W	SE	0	0	
120	014	hud	33.977896000	-118.462560000	6,274	21	2S	15W	SE	0	0	
120	014	hud	33.977661000	-118.463066000	0	21	2S	15W	SE	0	0	
120	006	hud	33.976182000	-118.461510000	5,907	21	2S	15W	SE	0	0	
120	014	hud	33.977818000	-118.464425000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974259000	-118.461406000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974857000	-118.461266000	0	21	2S	15W	SE	0	0	
120	014	hud	33.975242000	-118.458904000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976098000	-118.463462000	0	21	2S	15W	SE	0	0	
120	014	hud	33.975354000	-118.462388000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976901000	-118.462540000	0	21	2S	15W	SE	0	0	
120	006	hud	33.978026000	-118.461985000	6,074	21	2S	15W	SE	0	0	
120	014	hud	33.977932000	-118.460986000	0	21	2S	15W	SE	0	0	
120	006	hud	33.977085000	-118.462699000	6,148	21	2S	15W	SE	0	0	
120	006	hud	33.976263000	-118.461375000	6,282	21	2S	15W	SE	0	0	
120	014	hud	33.978031000	-118.464009000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974772000	-118.461930000	0	21	2S	15W	SE	0	0	
120	014	hud	33.977691000	-118.461610000	0	21	2S	15W	SE	0	0	
120	014	hud	33.978057000	-118.462896000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976117000	-118.463035000	0	21	2S	15W	SE	0	0	
120	006	hud	33.976853000	-118.463399000	6,150	21	2S	15W	SE	0	0	
120	014	hud	33.976309000	-118.463607000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976439000	-118.460048000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976978000	-118.461013000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976749000	-118.462384000	0	21	2S	15W	SE	0	0	
120	014	hud	33.978519000	-118.464440000	0	21	2S	15W	SE	0	0	
120	014	hud	33.978227000	-118.462037000	0	21	2S	15W	SE	0	0	
120	006	hud	33.977338000	-118.461486000	6,214	21	2S	15W	SE	0	0	
120	014	hud	33.977522000	-118.462569000	0	21	2S	15W	SE	0	0	
120	006	hud	33.977483000	-118.464772000	4,093	21	2S	15W	SE	0	0	
120	014	hud	33.974862000	-118.459513000	0	21	2S	15W	SE	0	0	
120	014	hud	33.977391000	-118.460662000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976997000	-118.461722000	0	21	2S	15W	SE	0	0	
120	006	hud	33.975895000	-118.461333000	6,118	21	2S	15W	SE	0	0	
120	014	hud	33.975667000	-118.461138000	0	21	2S	15W	SE	0	0	
120	006	hud	33.977943000	-118.464219000	5,497	21	2S	15W	SE	0	0	
120	014	hud	33.977517000	-118.462169000	0	21	2S	15W	SE	0	0	
120	014	hud	33.975979000	-118.460678000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974551000	-118.457006000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974957000	-118.462559000	0	21	2S	15W	SE	0	0	
120	014	hud	33.975985000	-118.463269000	0	21	2S	15W	SE	0	0	
120	014	hud	33.975260000	-118.462662000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974865000	-118.462498000	0	21	2S	15W	SE	0	0	
120	014	hud	33.978188000	-118.461384000	0	21	2S	15W	SE	0	0	
120	014	hud	33.975090000	-118.462170000	0	21	2S	15W	SE	0	0	
120	006	hud	33.977236000	-118.462365000	5,398	21	2S	15W	SE	0	0	
120	014	hud	33.978692000	-118.461447000	0	21	2S	15W	SE	0	0	
120	014	hud	33.976833000	-118.459091000	0	21	2S	15W	SE	0	0	
120	014	hud	33.978077000	-118.461165000	0	21	2S	15W	SE	0	0	
120	006	hud	33.976957000	-118.462179000	4,257	21	2S	15W	SE	0	0	
120	014	hud	33.974434000	-118.460389000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974760000	-118.458413000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974385000	-118.462028000	0	21	2S	15W	SE	0	0	
120	006	hud	33.977240000	-118.463311000	3,917	21	2S	15W	SE	0	0	
120	006	hud	33.976013000	-118.461001000	6,143	21	2S	15W	SE	0	0	
120	014	hud	33.975686000	-118.460446000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974029000	-118.458288000	0	21	2S	15W	SE	0	0	
120	014	hud	33.974226000	-118.459312000	0	21	2S	15W	SE	0	0	

APPENDIX 5.2

Noise Modeling

Table N-1
NOISE LEVEL CONTOURS - Existing Off-Site ADT Volumes

ROADWAY NAME Segment	Land Use	Lanes	Median Width	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor	Alpha Factor (1)	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	dB(A) CNEL	Traffic Volumes Day	Eve	Night	MTd	HTd	MTe	HTe	MTn	HTn	Ref. Energy Levels A	MT	HT	Dist Adj	Ld A	MT	HT	Total	Le A	MT	HT	Total	Ln A	MT	HT	Total
WASHINGTON BOULEVARD																																				
East of Via Marina	Residential	4	0	18,310	40	50	0	0	1.8%	0.7%	67.9	13,733	1,831	2,747	247	96	16	9	66	22	67.4	76.3	81.2	0.2	66.7	58.4	59.1	67.9	62.8	51.4	53.6	63.6	48.7	53.8	53.8	57.5
VIA MARINA																																				
South of Admiralty Way	Residential	4	0	16,580	40	50	0	0	1.8%	0.7%	67.4	12,435	1,658	2,487	224	87	15	8	60	20	67.4	76.3	81.2	0.2	66.3	57.9	58.7	67.5	62.4	51.0	53.2	63.2	48.3	53.4	53.4	57.0
ADMIRALTY WAY																																				
East of Via Marina	Park	4	0	24,840	40	50	0	0	1.8%	0.7%	69.2	18,630	2,484	3,726	335	130	22	12	89	30	67.4	76.3	81.2	0.2	68.1	59.7	60.4	69.3	64.2	52.7	54.9	64.9	50.0	55.1	55.2	58.8
LINCOLN BOULEVARD																																				
North of Fiji Way	Hospital	6	12	33,120	40	50	0	0	1.8%	0.7%	71.7	24,840	3,312	4,968	447	174	30	16	119	39	67.4	76.3	81.2	1.5	70.6	62.2	63.0	71.8	66.7	55.3	57.5	67.5	52.6	57.7	57.7	61.3
FIJI WAY																																				
West of Lincoln Boulevard	Residential	2	0	18,020	35	50	0	0	1.8%	0.7%	66.3	13,515	1,802	2,703	243	95	16	9	65	21	65.1	74.8	80.0	0.0	64.7	57.1	58.2	66.2	60.8	50.1	52.7	61.8	46.7	52.6	53.0	56.3
MINDANAO WAY																																				
East of Lincoln Boulevard	Residential	4	0	12,430	35	50	0	0	1.8%	0.7%	65.0	9,323	1,243	1,865	168	65	11	6	45	15	65.1	74.8	80.0	0.2	63.4	55.8	56.9	64.8	59.5	48.8	51.4	60.4	45.3	51.2	51.6	54.9
MARQUESAS WAY																																				
East of Via Marina	Residential	2	0	1,230	30	50	0	0	1.8%	0.7%	53.8	923	123	185	17	6	1	1	4	1	62.5	73.1	80.3	0.0	51.1	44.4	47.4	53.3	47.2	37.4	41.9	48.7	33.1	39.9	42.2	44.5
PANAY WAY																																				
East of Via Marina	Residential/Recreation	2	6	2,210	30	50	0	0	1.8%	0.7%	56.4	1,658	221	332	30	12	2	1	8	3	62.5	73.1	80.3	0.0	53.7	47.0	50.0	55.9	49.8	40.0	44.5	51.3	35.7	42.4	44.8	47.1
PALAWAN WAY																																				
South of Washington Boulevard	Recreation	4	12	6,430	30	50	0	0	1.8%	0.7%	61.6	4,823	643	965	87	34	6	3	23	8	62.5	73.1	80.3	0.5	58.9	52.1	55.2	61.0	55.0	45.2	49.7	56.4	40.8	47.6	49.9	52.2
TAHITI WAY																																				
East of Via Marina	Residential	2	0	1,460	30	50	0	0	1.8%	0.7%	54.6	1,095	146	219	20	8	1	1	5	2	62.5	73.1	80.3	0.0	51.9	45.1	48.2	54.0	48.0	38.2	42.7	49.4	33.8	40.6	42.9	45.3

(1) Alpha Factor: Coefficient of absorption relating to the effects of the ground surface. An alpha factor of 0 indicates that the site is an acoustically "hard" site such as aspalt. An alpha factor of 0.5 indicates that the site is an acoustically "soft" site such as vegetative ground cover.

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	75.00%	10.00%	15.00%
Medium-Duty Trucks	75.00%	5.00%	20.00%
Heavy-Duty Trucks	75.00%	7.00%	17.00%

Table N-2
NOISE LEVEL CONTOURS - Existing Plus Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project ADT Volumes

ROADWAY NAME Segment	Land Use	Lanes	Median Width	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor	Alpha Factor (1)	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	dB(A) CNEL	Traffic Volumes Day	Eve	Night	MTd	HTd	MTe	HTe	MTn	HTn	Ref. Energy Levels Dist A	MT	HT	Adj	Ld A	MT	HT	Total	Le A	MT	HT	Total	Ln A	MT	HT	Total
WASHINGTON BOULEVARD																																				
East of Via Marina	Residential	4	0	18,820	40	50	0	0	1.8%	0.7%	68.0	14,115	1,882	2,823	254	99	17	9	68	22	67.4	76.3	81.2	0.2	66.9	58.5	59.2	68.1	63.0	51.5	53.7	63.7	48.8	53.9	54.0	57.6
VIA MARINA																																				
South of Admiralty Way	Residential	4	0	18,780	40	50	0	0	1.8%	0.7%	68.0	14,085	1,878	2,817	254	99	17	9	68	22	67.4	76.3	81.2	0.2	66.8	58.5	59.2	68.0	62.9	51.5	53.7	63.7	48.8	53.9	54.0	57.6
ADMIRALTY WAY																																				
East of Via Marina	Park	4	0	27,150	40	50	0	0	1.8%	0.7%	69.6	20,363	2,715	4,073	367	143	24	13	98	32	67.4	76.3	81.2	0.2	68.4	60.1	60.8	69.6	64.5	53.1	55.3	65.3	50.4	55.5	55.6	59.2
LINCOLN BOULEVARD																																				
North of Fiji Way	Hospital	6	12	33,170	40	50	0	0	1.8%	0.7%	71.7	24,878	3,317	4,976	448	174	30	16	119	39	67.4	76.3	81.2	1.5	70.6	62.2	63.0	71.8	66.7	55.3	57.5	67.5	52.6	57.7	57.7	61.3
FIJI WAY																																				
West of Lincoln Boulevard	Residential	2	0	18,290	35	50	0	0	1.8%	0.7%	66.4	13,718	1,829	2,744	247	96	16	9	66	22	65.1	74.8	80.0	0.0	64.8	57.2	58.3	66.2	60.9	50.2	52.8	61.8	46.7	52.6	53.0	56.4
MINDANAO WAY																																				
East of Lincoln Boulevard	Residential	4	0	13,490	35	50	0	0	1.8%	0.7%	65.3	10,118	1,349	2,024	182	71	12	7	49	16	65.1	74.8	80.0	0.2	63.7	56.1	57.2	65.2	59.8	49.2	51.7	60.8	45.7	51.6	52.0	55.3
MARQUESAS WAY																																				
East of Via Marina	Residential	2	0	1,940	30	50	0	0	1.8%	0.7%	55.8	1,455	194	291	26	10	2	1	7	2	62.5	73.1	80.3	0.0	53.1	46.4	49.4	55.3	49.2	39.4	43.9	50.7	35.1	41.8	44.2	46.5
PANAY WAY																																				
East of Via Marina	Residential	2	6	2,210	30	50	0	0	1.8%	0.7%	56.4	1,658	221	332	30	12	2	1	8	3	62.5	73.1	80.3	0.0	53.7	47.0	50.0	55.9	49.8	40.0	44.5	51.3	35.7	42.4	44.8	47.1
PALAWAN WAY																																				
South of Washington Boulevard	Recreation	4	12	6,470	30	50	0	0	1.8%	0.7%	61.6	4,853	647	971	87	34	6	3	23	8	62.5	73.1	80.3	0.5	58.9	52.2	55.2	61.0	55.0	45.2	49.7	56.4	40.8	47.6	49.9	52.3
TAHITI WAY																																				
East of Via Marina	Residential	2	0	1,460	30	50	0	0	1.8%	0.7%	54.6	1,095	146	219	20	8	1	1	5	2	62.5	73.1	80.3	0.0	51.9	45.1	48.2	54.0	48.0	38.2	42.7	49.4	33.8	40.6	42.9	45.3

(1) Alpha Factor: Coefficient of absorption relating to the effects of the ground surface. An alpha factor of 0 indicates that the site is an acoustically "hard" site such as aspalt. An alpha factor of 0.5 indicates that the site is an acoustically "soft" site such as vegetative ground cover.

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	75.00%	10.00%	15.00%
Medium-Duty Trucks	75.00%	5.00%	20.00%
Heavy-Duty Trucks	75.00%	7.00%	17.00%

Table N-3
NOISE LEVEL CONTOURS - Existing Plus Neptune Marina Parcel 10R ADT Volumes

ROADWAY NAME Segment	Land Use	Lanes	Median Width	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor	Alpha Factor (1)	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	dB(A) CNEL	Traffic Volumes Day	Eve	Night	MTd	HTd	MTe	HTe	MTn	HTn	Ref. Energy Levels A	MT	HT	Dist Adj	Ld A	MT	HT	Total	Le A	MT	HT	Total	Ln A	MT	HT	Total
WASHINGTON BOULEVARD																																				
East of Via Marina	Residential	4	0	18,450	40	50	0	0	1.8%	0.7%	67.9	13,838	1,845	2,768	249	97	17	9	66	22	67.4	76.3	81.2	0.2	66.8	58.4	59.1	68.0	62.9	51.4	53.6	63.6	48.7	53.8	53.9	57.5
VIA MARINA																																				
South of Admiralty Way	Residential	4	0	17,390	40	50	0	0	1.8%	0.7%	67.6	13,043	1,739	2,609	235	91	16	9	63	21	67.4	76.3	81.2	0.2	66.5	58.1	58.9	67.7	62.6	51.2	53.4	63.4	48.5	53.6	53.6	57.2
ADMIRALTY WAY																																				
East of Via Marina	Park	4	0	25,390	40	50	0	0	1.8%	0.7%	69.3	19,043	2,539	3,809	343	133	23	12	91	30	67.4	76.3	81.2	0.2	68.2	59.8	60.5	69.4	64.3	52.8	55.0	65.0	50.1	55.2	55.3	58.9
LINCOLN BOULEVARD																																				
North of Fiji Way	Hospital	6	12	33,140	40	50	0	0	1.8%	0.7%	71.7	24,855	3,314	4,971	447	174	30	16	119	39	67.4	76.3	81.2	1.5	70.6	62.2	63.0	71.8	66.7	55.3	57.5	67.5	52.6	57.7	57.7	61.3
FIJI WAY																																				
West of Lincoln Boulevard	Residential	2	0	18,110	35	50	0	0	1.8%	0.7%	66.3	13,583	1,811	2,717	244	95	16	9	65	22	65.1	74.8	80.0	0.0	64.7	57.1	58.2	66.2	60.8	50.2	52.7	61.8	46.7	52.6	53.0	56.3
MINDANAO WAY																																				
East of Lincoln Boulevard	Residential	4	0	12,800	35	50	0	0	1.8%	0.7%	65.1	9,600	1,280	1,920	173	67	12	6	46	15	65.1	74.8	80.0	0.2	63.5	55.9	57.0	65.0	59.6	48.9	51.5	60.5	45.5	51.4	51.8	55.1
MARQUESAS WAY																																				
East of Via Marina	Residential	2	0	1,650	30	50	0	0	1.8%	0.7%	55.1	1,238	165	248	22	9	1	1	6	2	62.5	73.1	80.3	0.0	52.4	45.7	48.7	54.6	48.5	38.7	43.2	50.0	34.4	41.1	43.5	45.8
PANAY WAY																																				
East of Via Marina	Residential	2	6	2,210	30	50	0	0	1.8%	0.7%	56.4	1,658	221	332	30	12	2	1	8	3	62.5	73.1	80.3	0.0	53.7	47.0	50.0	55.9	49.8	40.0	44.5	51.3	35.7	42.4	44.8	47.1
PALAWAN WAY																																				
South of Washington Boulevard	Recreation	4	12	6,460	30	50	0	0	1.8%	0.7%	61.6	4,845	646	969	87	34	6	3	23	8	62.5	73.1	80.3	0.5	58.9	52.1	55.2	61.0	55.0	45.2	49.7	56.4	40.8	47.6	49.9	52.3
TAHITI WAY																																				
East of Via Marina	Residential	2	0	1,460	30	50	0	0	1.8%	0.7%	54.6	1,095	146	219	20	8	1	1	5	2	62.5	73.1	80.3	0.0	51.9	45.1	48.2	54.0	48.0	38.2	42.7	49.4	33.8	40.6	42.9	45.3

(1) Alpha Factor: Coefficient of absorption relating to the effects of the ground surface. An alpha factor of 0 indicates that the site is an acoustically "hard" site such as aspalt. An alpha factor of 0.5 indicates that the site is an acoustically "soft" site such as vegetative ground cover.

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	75.00%	10.00%	15.00%
Medium-Duty Trucks	75.00%	5.00%	20.00%
Heavy-Duty Trucks	75.00%	7.00%	17.00%

Table N-4
NOISE LEVEL CONTOURS - Existing Plus Neptune Marina Parcel FF ADT Volumes

ROADWAY NAME Segment	Land Use	Lanes	Median Width	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor	Alpha Factor (1)	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	dB(A) CNEL	Traffic Volumes Day	Eve	Night	MTd	HTd	MTe	HTe	MTn	HTn	Ref. Energy Levels A	MT	HT	Dist Adj	Ld A	MT	HT	Total	Le A	MT	HT	Total	Ln A	MT	HT	Total
WASHINGTON BOULEVARD																																				
East of Via Marina	Residential	4	0	18,380	40	50	0	0	1.8%	0.7%	67.9	13,785	1,838	2,757	248	96	17	9	66	22	67.4	76.3	81.2	0.2	66.8	58.4	59.1	67.9	62.9	51.4	53.6	63.6	48.7	53.8	53.9	57.5
VIA MARINA																																				
South of Admiralty Way	Residential	4	0	16,960	40	50	0	0	1.8%	0.7%	67.5	12,720	1,696	2,544	229	89	15	8	61	20	67.4	76.3	81.2	0.2	66.4	58.0	58.8	67.6	62.5	51.1	53.3	63.3	48.4	53.5	53.5	57.1
ADMIRALTY WAY																																				
East of Via Marina	Park	4	0	25,100	40	50	0	0	1.8%	0.7%	69.2	18,825	2,510	3,765	339	132	23	12	90	30	67.4	76.3	81.2	0.2	68.1	59.7	60.5	69.3	64.2	52.8	55.0	65.0	50.1	55.2	55.2	58.8
LINCOLN BOULEVARD																																				
North of Fiji Way	Hospital	6	12	33,130	40	50	0	0	1.8%	0.7%	71.7	24,848	3,313	4,970	447	174	30	16	119	39	67.4	76.3	81.2	1.5	70.6	62.2	63.0	71.8	66.7	55.3	57.5	67.5	52.6	57.7	57.7	61.3
FIJI WAY																																				
West of Lincoln Boulevard	Residential	2	0	18,070	35	50	0	0	1.8%	0.7%	66.3	13,553	1,807	2,711	244	95	16	9	65	22	65.1	74.8	80.0	0.0	64.7	57.1	58.2	66.2	60.8	50.2	52.7	61.8	46.7	52.6	53.0	56.3
MINDANAO WAY																																				
East of Lincoln Boulevard	Residential	4	0	12,610	35	50	0	0	1.8%	0.7%	65.0	9,458	1,261	1,892	170	66	11	6	45	15	65.1	74.8	80.0	0.2	63.4	55.8	56.9	64.9	59.5	48.9	51.4	60.5	45.4	51.3	51.7	55.0
MARQUESAS WAY																																				
East of Via Marina	Residential	2	0	1,520	30	50	0	0	1.8%	0.7%	54.8	1,140	152	228	21	8	1	1	5	2	62.5	73.1	80.3	0.0	52.1	45.3	48.4	54.2	48.2	38.4	42.9	49.6	34.0	40.8	43.1	45.4
PANAY WAY																																				
East of Via Marina	Residential	2	6	2,210	30	50	0	0	1.8%	0.7%	56.4	1,658	221	332	30	12	2	1	8	3	62.5	73.1	80.3	0.0	53.7	47.0	50.0	55.9	49.8	40.0	44.5	51.3	35.7	42.4	44.8	47.1
PALAWAN WAY																																				
South of Washington Boulevard	Recreation	4	12	6,440	30	50	0	0	1.8%	0.7%	61.6	4,830	644	966	87	34	6	3	23	8	62.5	73.1	80.3	0.5	58.9	52.1	55.2	61.0	55.0	45.2	49.7	56.4	40.8	47.6	49.9	52.3
TAHITI WAY																																				
East of Via Marina	Residential	2	0	1,460	30	50	0	0	1.8%	0.7%	54.6	1,095	146	219	20	8	1	1	5	2	62.5	73.1	80.3	0.0	51.9	45.1	48.2	54.0	48.0	38.2	42.7	49.4	33.8	40.6	42.9	45.3

(1) Alpha Factor: Coefficient of absorption relating to the effects of the ground surface. An alpha factor of 0 indicates that the site is an acoustically "hard" site such as aspalt. An alpha factor of 0.5 indicates that the site is an acoustically "soft" site such as vegetative ground cover.

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	75.00%	10.00%	15.00%
Medium-Duty Trucks	75.00%	5.00%	20.00%
Heavy-Duty Trucks	75.00%	7.00%	17.00%

Table N-5
NOISE LEVEL CONTOURS - Existing Plus Woodfin Suites Hotel and Vacation Club (Parcel 9U) ADT Volumes

ROADWAY NAME Segment	Land Use	Lanes	Median Width	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor	Alpha Factor (1)	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	dB(A) CNEL	Traffic Volumes Day	Eve	Night	MTd	HTd	MTe	HTe	MTn	HTn	Ref. Energy Levels A	MT	HT	Dist Adj	Ld A	MT	HT	Total	Le A	MT	HT	Total	Ln A	MT	HT	Total
WASHINGTON BOULEVARD																																				
East of Via Marina	Residential	4	0	18,610	40	50	0	0	1.8%	0.7%	67.9	13,958	1,861	2,792	251	98	17	9	67	22	67.4	76.3	81.2	0.2	66.8	58.4	59.2	68.0	62.9	51.5	53.7	63.7	48.8	53.9	53.9	57.5
VIA MARINA																																				
South of Admiralty Way	Residential	4	0	17,600	40	50	0	0	1.8%	0.7%	67.7	13,200	1,760	2,640	238	92	16	9	63	21	67.4	76.3	81.2	0.2	66.6	58.2	58.9	67.8	62.7	51.2	53.4	63.4	48.5	53.6	53.7	57.3
ADMIRALTY WAY																																				
East of Via Marina	Park	4	0	25,510	40	50	0	0	1.8%	0.7%	69.3	19,133	2,551	3,827	344	134	23	12	92	30	67.4	76.3	81.2	0.2	68.2	59.8	60.5	69.4	64.3	52.8	55.0	65.0	50.1	55.3	55.3	58.9
LINCOLN BOULEVARD																																				
North of Fiji Way	Hospital	6	12	33,140	40	50	0	0	1.8%	0.7%	71.7	24,855	3,314	4,971	447	174	30	16	119	39	67.4	76.3	81.2	1.5	70.6	62.2	63.0	71.8	66.7	55.3	57.5	67.5	52.6	57.7	57.7	61.3
FIJI WAY																																				
West of Lincoln Boulevard	Residential	2	0	18,150	35	50	0	0	1.8%	0.7%	66.3	13,613	1,815	2,723	245	95	16	9	65	22	65.1	74.8	80.0	0.0	64.8	57.1	58.3	66.2	60.9	50.2	52.8	61.8	46.7	52.6	53.0	56.3
MINDANAO WAY																																				
East of Lincoln Boulevard	Residential	4	0	12,950	35	50	0	0	1.8%	0.7%	65.1	9,713	1,295	1,943	175	68	12	6	47	15	65.1	74.8	80.0	0.2	63.6	55.9	57.1	65.0	59.7	49.0	51.6	60.6	45.5	51.4	51.8	55.1
MARQUESAS WAY																																				
East of Via Marina	Residential	2	0	1,230	30	50	0	0	1.8%	0.7%	53.8	923	123	185	17	6	1	1	4	1	62.5	73.1	80.3	0.0	51.1	44.4	47.4	53.3	47.2	37.4	41.9	48.7	33.1	39.9	42.2	44.5
PANAY WAY																																				
East of Via Marina	Residential	2	6	2,210	30	50	0	0	1.8%	0.7%	56.4	1,658	221	332	30	12	2	1	8	3	62.5	73.1	80.3	0.0	53.7	47.0	50.0	55.9	49.8	40.0	44.5	51.3	35.7	42.4	44.8	47.1
PALAWAN WAY																																				
South of Washington Boulevard	Recreation	4	12	6,430	30	50	0	0	1.8%	0.7%	61.6	4,823	643	965	87	34	6	3	23	8	62.5	73.1	80.3	0.5	58.9	52.1	55.2	61.0	55.0	45.2	49.7	56.4	40.8	47.6	49.9	52.2
TAHITI WAY																																				
East of Via Marina	Residential	2	0	1,460	30	50	0	0	1.8%	0.7%	54.6	1,095	146	219	20	8	1	1	5	2	62.5	73.1	80.3	0.0	51.9	45.1	48.2	54.0	48.0	38.2	42.7	49.4	33.8	40.6	42.9	45.3

(1) Alpha Factor: Coefficient of absorption relating to the effects of the ground surface. An alpha factor of 0 indicates that the site is an acoustically "hard" site such as aspalt. An alpha factor of 0.5 indicates that the site is an acoustically "soft" site such as vegetative ground cover.

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	75.00%	10.00%	15.00%
Medium-Duty Trucks	75.00%	5.00%	20.00%
Heavy-Duty Trucks	75.00%	7.00%	17.00%

Table N-6
NOISE LEVEL CONTOURS - Future Without Project ADT Volumes

ROADWAY NAME Segment	Land Use	Lanes	Median Width	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor	Alpha Factor (1)	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	dB(A) CNEL	Traffic Volumes Day	Eve	Night	MTd	HTd	MTe	HTe	MTn	HTn	Ref. Energy Levels A	MT	HT	Dist Adj	Ld A	MT	HT	Total	Le A	MT	HT	Total	Ln A	MT	HT	Total
WASHINGTON BOULEVARD																																				
East of Via Marina	Residential	4	0	18,750	40	50	0	0	1.8%	0.7%	68.0	14,063	1,875	2,813	253	98	17	9	68	22	67.4	76.3	81.2	0.2	66.8	58.5	59.2	68.0	62.9	51.5	53.7	63.7	48.8	53.9	54.0	57.6
VIA MARINA																																				
South of Admiralty Way	Residential	4	0	17,000	40	50	0	0	1.8%	0.7%	67.5	12,750	1,700	2,550	230	89	15	8	61	20	67.4	76.3	81.2	0.2	66.4	58.0	58.8	67.6	62.5	51.1	53.3	63.3	48.4	53.5	53.5	57.1
ADMIRALTY WAY																																				
East of Via Marina	Park	4	0	25,450	40	50	0	0	1.8%	0.7%	69.3	19,088	2,545	3,818	344	134	23	12	92	30	67.4	76.3	81.2	0.2	68.2	59.8	60.5	69.4	64.3	52.8	55.0	65.0	50.1	55.2	55.3	58.9
LINCOLN BOULEVARD																																				
North of Fiji Way	Hospital	6	12	33,910	40	50	0	0	1.8%	0.7%	71.8	25,433	3,391	5,087	458	178	31	17	122	40	67.4	76.3	81.2	1.5	70.7	62.3	63.1	71.9	66.8	55.4	57.6	67.6	52.7	57.8	57.8	61.4
FIJI WAY																																				
West of Lincoln Boulevard	Residential	2	0	18,460	35	50	0	0	1.8%	0.7%	66.4	13,845	1,846	2,769	249	97	17	9	66	22	65.1	74.8	80.0	0.0	64.8	57.2	58.3	66.3	60.9	50.3	52.8	61.9	46.8	52.7	53.1	56.4
MINDANAO WAY																																				
East of Lincoln Boulevard	Residential	4	0	13,320	35	50	0	0	1.8%	0.7%	65.3	9,990	1,332	1,998	180	70	12	7	48	16	65.1	74.8	80.0	0.2	63.7	56.1	57.2	65.1	59.8	49.1	51.7	60.7	45.6	51.5	51.9	55.2
MARQUESAS WAY																																				
East of Via Marina	Residential	2	0	1,260	30	50	0	0	1.8%	0.7%	53.9	945	126	189	17	7	1	1	5	1	62.5	73.1	80.3	0.0	51.2	44.5	47.6	53.4	47.3	37.5	42.1	48.8	33.2	40.0	42.3	44.6
PANAY WAY																																				
East of Via Marina	Residential	2	6	2,270	30	50	0	0	1.8%	0.7%	56.5	1,703	227	341	31	12	2	1	8	3	62.5	73.1	80.3	0.0	53.8	47.1	50.1	56.0	49.9	40.1	44.6	51.4	35.8	42.6	44.9	47.2
PALAWAN WAY																																				
South of Washington Boulevard	Recreation	4	12	6,590	30	50	0	0	1.8%	0.7%	61.7	4,943	659	989	89	35	6	3	24	8	62.5	73.1	80.3	0.5	59.0	52.2	55.3	61.1	55.1	45.3	49.8	56.5	40.9	47.7	50.0	52.4
TAHITI WAY																																				
East of Via Marina	Residential	2	0	1,490	30	50	0	0	1.8%	0.7%	54.7	1,118	149	224	20	8	1	1	5	2	62.5	73.1	80.3	0.0	52.0	45.2	48.3	54.1	48.1	38.3	42.8	49.5	33.9	40.7	43.0	45.4

(1) Alpha Factor: Coefficient of absorption relating to the effects of the ground surface. An alpha factor of 0 indicates that the site is an acoustically "hard" site such as aspalt. An alpha factor of 0.5 indicates that the site is an acoustically "soft" site such as vegetative ground cover.

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	75.00%	10.00%	15.00%
Medium-Duty Trucks	75.00%	5.00%	20.00%
Heavy-Duty Trucks	75.00%	7.00%	17.00%

Table N-7
NOISE LEVEL CONTOURS - Future Plus Neptune Marina Project ADT Volumes

ROADWAY NAME Segment	Land Use	Lanes	Median Width	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor	Alpha Factor (1)	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	dB(A) CNEL	Traffic Volumes Day	Eve	Night	MTd	HTd	MTe	HTe	MTn	HTn	Ref. Energy Levels A	MT	HT	Dist Adj	Ld A	MT	HT	Total	Le A	MT	HT	Total	Ln A	MT	HT	Total
WASHINGTON BOULEVARD																																				
East of Via Marina	Residential	4	0	22,860	40	50	0	0	1.8%	0.7%	68.8	17,145	2,286	3,429	309	120	21	11	82	27	67.4	76.3	81.2	0.2	67.7	59.3	60.1	68.9	63.8	52.4	54.6	64.6	49.7	54.8	54.8	58.4
VIA MARINA																																				
South of Admiralty Way	Residential	4	0	19,200	40	50	0	0	1.8%	0.7%	68.1	14,400	1,920	2,880	259	101	17	9	69	23	67.4	76.3	81.2	0.2	66.9	58.6	59.3	68.1	63.0	51.6	53.8	63.8	48.9	54.0	54.1	57.7
ADMIRALTY WAY																																				
East of Via Marina	Park	4	0	26,920	40	50	0	0	1.8%	0.7%	69.5	20,190	2,692	4,038	363	141	24	13	97	32	67.4	76.3	81.2	0.2	68.4	60.0	60.8	69.6	64.5	53.1	55.3	65.3	50.4	55.5	55.5	59.1
LINCOLN BOULEVARD																																				
North of Fiji Way	Hospital	6	12	33,960	40	50	0	0	1.8%	0.7%	71.8	25,470	3,396	5,094	458	178	31	17	122	40	67.4	76.3	81.2	1.5	70.7	62.3	63.1	71.9	66.8	55.4	57.6	67.6	52.7	57.8	57.8	61.4
FIJI WAY																																				
West of Lincoln Boulevard	Residential	2	0	18,730	35	50	0	0	1.8%	0.7%	66.5	14,048	1,873	2,810	253	98	17	9	67	22	65.1	74.8	80.0	0.0	64.9	57.3	58.4	66.3	61.0	50.3	52.9	61.9	46.9	52.7	53.1	56.5
MINDANAO WAY																																				
East of Lincoln Boulevard	Residential	4	0	14,380	35	50	0	0	1.8%	0.7%	65.6	10,785	1,438	2,157	194	75	13	7	52	17	65.1	74.8	80.0	0.2	64.0	56.4	57.5	65.5	60.1	49.4	52.0	61.0	46.0	51.9	52.3	55.6
MARQUESAS WAY																																				
East of Via Marina	Residential	2	0	1,950	30	50	0	0	1.8%	0.7%	55.8	1,463	195	293	26	10	2	1	7	2	62.5	73.1	80.3	0.0	53.1	46.4	49.4	55.3	49.2	39.4	43.9	50.7	35.1	41.9	44.2	46.5
PANAY WAY																																				
East of Via Marina	Residential	2	6	2,270	30	50	0	0	1.8%	0.7%	56.5	1,703	227	341	31	12	2	1	8	3	62.5	73.1	80.3	0.0	53.8	47.1	50.1	56.0	49.9	40.1	44.6	51.4	35.8	42.6	44.9	47.2
PALAWAN WAY																																				
South of Washington Boulevard	Recreation	4	12	6,630	30	50	0	0	1.8%	0.7%	61.7	4,973	663	995	90	35	6	3	24	8	62.5	73.1	80.3	0.5	59.0	52.3	55.3	61.1	55.1	45.3	49.8	56.6	41.0	47.7	50.1	52.4
TAHITI WAY																																				
East of Via Marina	Residential	2	0	1,490	30	50	0	0	1.8%	0.7%	54.7	1,118	149	224	20	8	1	1	5	2	62.5	73.1	80.3	0.0	52.0	45.2	48.3	54.1	48.1	38.3	42.8	49.5	33.9	40.7	43.0	45.4

(1) Alpha Factor: Coefficient of absorption relating to the effects of the ground surface. An alpha factor of 0 indicates that the site is an acoustically "hard" site such as aspalt. An alpha factor of 0.5 indicates that the site is an acoustically "soft" site such as vegetative ground cover.

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	75.00%	10.00%	15.00%
Medium-Duty Trucks	75.00%	5.00%	20.00%
Heavy-Duty Trucks	75.00%	7.00%	17.00%

Table N-8
NOISE LEVEL CONTOURS - Future Plus Neptune Marina Parcel 10R ADT Volumes

ROADWAY NAME Segment	Land Use	Lanes	Median Width	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor	Alpha Factor (1)	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	dB(A) CNEL	Traffic Volumes Day	Eve	Night	MTd	HTd	MTe	HTe	MTn	HTn	Ref. Energy Levels A	MT	HT	Dist Adj	Ld A	MT	HT	Total	Le A	MT	HT	Total	Ln A	MT	HT	Total
WASHINGTON BOULEVARD																																				
East of Via Marina	Residential	4	0	18,890	40	50	0	0	1.8%	0.7%	68.0	14,168	1,889	2,834	255	99	17	9	68	22	67.4	76.3	81.2	0.2	66.9	58.5	59.2	68.1	63.0	51.5	53.7	63.7	48.8	53.9	54.0	57.6
VIA MARINA																																				
South of Admiralty Way	Residential	4	0	16,810	40	50	0	0	1.8%	0.7%	67.5	12,608	1,681	2,522	227	88	15	8	61	20	67.4	76.3	81.2	0.2	66.4	58.0	58.7	67.6	62.5	51.0	53.2	63.2	48.3	53.4	53.5	57.1
ADMIRALTY WAY																																				
East of Via Marina	Park	4	0	26,000	40	50	0	0	1.8%	0.7%	69.4	19,500	2,600	3,900	351	137	23	13	94	31	67.4	76.3	81.2	0.2	68.3	59.9	60.6	69.5	64.4	52.9	55.1	65.1	50.2	55.3	55.4	59.0
LINCOLN BOULEVARD																																				
North of Fiji Way	Hospital	6	12	33,930	40	50	0	0	1.8%	0.7%	71.8	25,448	3,393	5,090	458	178	31	17	122	40	67.4	76.3	81.2	1.5	70.7	62.3	63.1	71.9	66.8	55.4	57.6	67.6	52.7	57.8	57.8	61.4
FIJI WAY																																				
West of Lincoln Boulevard	Residential	2	0	18,550	35	50	0	0	1.8%	0.7%	66.4	13,913	1,855	2,783	250	97	17	9	67	22	65.1	74.8	80.0	0.0	64.9	57.2	58.3	66.3	60.9	50.3	52.8	61.9	46.8	52.7	53.1	56.4
MINDANAO WAY																																				
East of Lincoln Boulevard	Residential	4	0	13,890	35	50	0	0	1.8%	0.7%	65.4	10,418	1,389	2,084	188	73	13	7	50	17	65.1	74.8	80.0	0.2	63.9	56.2	57.4	65.3	60.0	49.3	51.9	60.9	45.8	51.7	52.1	55.4
MARQUESAS WAY																																				
East of Via Marina	Residential	2	0	1,670	30	50	0	0	1.8%	0.7%	55.2	1,253	167	251	23	9	2	1	6	2	62.5	73.1	80.3	0.0	52.5	45.7	48.8	54.6	48.6	38.8	43.3	50.0	34.4	41.2	43.5	45.9
PANAY WAY																																				
East of Via Marina	Residential	2	6	2,270	30	50	0	0	1.8%	0.7%	56.5	1,703	227	341	31	12	2	1	8	3	62.5	73.1	80.3	0.0	53.8	47.1	50.1	56.0	49.9	40.1	44.6	51.4	35.8	42.6	44.9	47.2
PALAWAN WAY																																				
South of Washington Boulevard	Recreation	4	12	6,620	30	50	0	0	1.8%	0.7%	61.7	4,965	662	993	89	35	6	3	24	8	62.5	73.1	80.3	0.5	59.0	52.3	55.3	61.1	55.1	45.3	49.8	56.5	40.9	47.7	50.0	52.4
TAHITI WAY																																				
East of Via Marina	Residential	2	0	1,490	30	50	0	0	1.8%	0.7%	54.7	1,118	149	224	20	8	1	1	5	2	62.5	73.1	80.3	0.0	52.0	45.2	48.3	54.1	48.1	38.3	42.8	49.5	33.9	40.7	43.0	45.4

(1) Alpha Factor: Coefficient of absorption relating to the effects of the ground surface. An alpha factor of 0 indicates that the site is an acoustically "hard" site such as aspalt. An alpha factor of 0.5 indicates that the site is an acoustically "soft" site such as vegetative ground cover.

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	75.00%	10.00%	15.00%
Medium-Duty Trucks	75.00%	5.00%	20.00%
Heavy-Duty Trucks	75.00%	7.00%	17.00%

Table N-9
NOISE LEVEL CONTOURS - Future Plus Neptune Marina Parcel FF ADT Volumes

ROADWAY NAME Segment	Land Use	Lanes	Median Width	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor	Alpha Factor (1)	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	dB(A) CNEL	Traffic Volumes Day	Eve	Night	MTd	HTd	MTe	HTe	MTn	HTn	Ref. Energy Levels A	MT	HT	Dist Adj	Ld A	MT	HT	Total	Le A	MT	HT	Total	Ln A	MT	HT	Total
WASHINGTON BOULEVARD																																				
East of Via Marina	Residential	4	0	18,820	40	50	0	0	1.8%	0.7%	68.0	14,115	1,882	2,823	254	99	17	9	68	22	67.4	76.3	81.2	0.2	66.9	58.5	59.2	68.1	63.0	51.5	53.7	63.7	48.8	53.9	54.0	57.6
VIA MARINA																																				
South of Admiralty Way	Residential	4	0	17,380	40	50	0	0	1.8%	0.7%	67.6	13,035	1,738	2,607	235	91	16	9	63	21	67.4	76.3	81.2	0.2	66.5	58.1	58.9	67.7	62.6	51.2	53.4	63.4	48.5	53.6	53.6	57.2
ADMIRALTY WAY																																				
East of Via Marina	Park	4	0	25,710	40	50	0	0	1.8%	0.7%	69.3	19,283	2,571	3,857	347	135	23	13	93	31	67.4	76.3	81.2	0.2	68.2	59.8	60.6	69.4	64.3	52.9	55.1	65.1	50.2	55.3	55.3	58.9
LINCOLN BOULEVARD																																				
North of Fiji Way	Hospital	6	12	33,920	40	50	0	0	1.8%	0.7%	71.8	25,440	3,392	5,088	458	178	31	17	122	40	67.4	76.3	81.2	1.5	70.7	62.3	63.1	71.9	66.8	55.4	57.6	67.6	52.7	57.8	57.8	61.4
FIJI WAY																																				
West of Lincoln Boulevard	Residential	2	0	18,510	35	50	0	0	1.8%	0.7%	66.4	13,883	1,851	2,777	250	97	17	9	67	22	65.1	74.8	80.0	0.0	64.8	57.2	58.3	66.3	60.9	50.3	52.8	61.9	46.8	52.7	53.1	56.4
MINDANAO WAY																																				
East of Lincoln Boulevard	Residential	4	0	13,500	35	50	0	0	1.8%	0.7%	65.3	10,125	1,350	2,025	182	71	12	7	49	16	65.1	74.8	80.0	0.2	63.7	56.1	57.2	65.2	59.8	49.2	51.7	60.8	45.7	51.6	52.0	55.3
MARQUESAS WAY																																				
East of Via Marina	Residential	2	0	1,540	30	50	0	0	1.8%	0.7%	54.8	1,155	154	231	21	8	1	1	6	2	62.5	73.1	80.3	0.0	52.1	45.4	48.4	54.3	48.2	38.4	42.9	49.7	34.1	40.8	43.2	45.5
PANAY WAY																																				
East of Via Marina	Residential	2	6	2,270	30	50	0	0	1.8%	0.7%	56.5	1,703	227	341	31	12	2	1	8	3	62.5	73.1	80.3	0.0	53.8	47.1	50.1	56.0	49.9	40.1	44.6	51.4	35.8	42.6	44.9	47.2
PALAWAN WAY																																				
South of Washington Boulevard	Recreation	4	12	6,600	30	50	0	0	1.8%	0.7%	61.7	4,950	660	990	89	35	6	3	24	8	62.5	73.1	80.3	0.5	59.0	52.2	55.3	61.1	55.1	45.3	49.8	56.5	40.9	47.7	50.0	52.4
TAHITI WAY																																				
East of Via Marina	Residential	2	0	1,490	30	50	0	0	1.8%	0.7%	54.7	1,118	149	224	20	8	1	1	5	2	62.5	73.1	80.3	0.0	52.0	45.2	48.3	54.1	48.1	38.3	42.8	49.5	33.9	40.7	43.0	45.4

(1) Alpha Factor: Coefficient of absorption relating to the effects of the ground surface. An alpha factor of 0 indicates that the site is an acoustically "hard" site such as aspalt. An alpha factor of 0.5 indicates that the site is an acoustically "soft" site such as vegetative ground cover.

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	75.00%	10.00%	15.00%
Medium-Duty Trucks	75.00%	5.00%	20.00%
Heavy-Duty Trucks	75.00%	7.00%	17.00%

Table N-10
NOISE LEVEL CONTOURS - Future Plus Woodfin Suites Hotel and Vacation Club (Parcel 9U) ADT Volumes

ROADWAY NAME Segment	Land Use	Lanes	Median Width	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor	Alpha Factor (1)	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	dB(A) CNEL	Traffic Volumes Day	Eve	Night	MTd	HTd	MTe	HTe	MTn	HTn	Ref. Energy Levels A	MT	HT	Dist Adj	Ld A	MT	HT	Total	Le A	MT	HT	Total	Ln A	MT	HT	Total
WASHINGTON BOULEVARD																																				
East of Via Marina	Residential	4	0	19,050	40	50	0	0	1.8%	0.7%	68.0	14,288	1,905	2,858	257	100	17	9	69	23	67.4	76.3	81.2	0.2	66.9	58.5	59.3	68.1	63.0	51.6	53.8	63.8	48.9	54.0	54.0	57.6
VIA MARINA																																				
South of Admiralty Way	Residential	4	0	18,020	40	50	0	0	1.8%	0.7%	67.8	13,515	1,802	2,703	243	95	16	9	65	21	67.4	76.3	81.2	0.2	66.7	58.3	59.0	67.9	62.8	51.3	53.5	63.5	48.6	53.7	53.8	57.4
ADMIRALTY WAY																																				
East of Via Marina	Park	4	0	26,120	40	50	0	0	1.8%	0.7%	69.4	19,590	2,612	3,918	353	137	24	13	94	31	67.4	76.3	81.2	0.2	68.3	59.9	60.6	69.5	64.4	52.9	55.1	65.1	50.2	55.4	55.4	59.0
LINCOLN BOULEVARD																																				
North of Fiji Way	Hospital	6	12	33,930	40	50	0	0	1.8%	0.7%	71.8	25,448	3,393	5,090	458	178	31	17	122	40	67.4	76.3	81.2	1.5	70.7	62.3	63.1	71.9	66.8	55.4	57.6	67.6	52.7	57.8	57.8	61.4
FIJI WAY																																				
West of Lincoln Boulevard	Residential	2	0	18,590	35	50	0	0	1.8%	0.7%	66.4	13,943	1,859	2,789	251	98	17	9	67	22	65.1	74.8	80.0	0.0	64.9	57.2	58.4	66.3	61.0	50.3	52.9	61.9	46.8	52.7	53.1	56.4
MINDANAO WAY																																				
East of Lincoln Boulevard	Residential	4	0	13,840	35	50	0	0	1.8%	0.7%	65.4	10,380	1,384	2,076	187	73	12	7	50	16	65.1	74.8	80.0	0.2	63.8	56.2	57.3	65.3	59.9	49.3	51.8	60.9	45.8	51.7	52.1	55.4
MARQUESAS WAY																																				
East of Via Marina	Residential	2	0	1,260	30	50	0	0	1.8%	0.7%	53.9	945	126	189	17	7	1	1	5	1	62.5	73.1	80.3	0.0	51.2	44.5	47.6	53.4	47.3	37.5	42.1	48.8	33.2	40.0	42.3	44.6
PANAY WAY																																				
East of Via Marina	Residential	2	6	2,270	30	50	0	0	1.8%	0.7%	56.5	1,703	227	341	31	12	2	1	8	3	62.5	73.1	80.3	0.0	53.8	47.1	50.1	56.0	49.9	40.1	44.6	51.4	35.8	42.6	44.9	47.2
PALAWAN WAY																																				
South of Washington Boulevard	Recreation	4	12	6,590	30	50	0	0	1.8%	0.7%	61.7	4,943	659	989	89	35	6	3	24	8	62.5	73.1	80.3	0.5	59.0	52.2	55.3	61.1	55.1	45.3	49.8	56.5	40.9	47.7	50.0	52.4
TAHITI WAY																																				
East of Via Marina	Residential	2	0	1,490	30	50	0	0	1.8%	0.7%	54.7	1,118	149	224	20	8	1	1	5	2	62.5	73.1	80.3	0.0	52.0	45.2	48.3	54.1	48.1	38.3	42.8	49.5	33.9	40.7	43.0	45.4

(1) Alpha Factor: Coefficient of absorption relating to the effects of the ground surface. An alpha factor of 0 indicates that the site is an acoustically "hard" site such as aspalt. An alpha factor of 0.5 indicates that the site is an acoustically "soft" site such as vegetative ground cover.

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	75.00%	10.00%	15.00%
Medium-Duty Trucks	75.00%	5.00%	20.00%
Heavy-Duty Trucks	75.00%	7.00%	17.00%

Table N-11
NOISE LEVEL CONTOURS - Future Plus Cumulative ADT Volumes

ROADWAY NAME Segment	Land Use	Lanes	Median Width	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor	Alpha Factor (1)	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	dB(A) CNEL	Traffic Volumes Day	Eve	Night	MTd	HTd	MTe	HTe	MTn	HTn	Ref. Energy Levels Dist A	MT	HT	Adj	Ld A	MT	HT	Total	Le A	MT	HT	Total	Ln A	MT	HT	Total
WASHINGTON BOULEVARD																																				
East of Via Marina	Residential	4	0	21,980	40	50	0	0	1.8%	0.7%	68.6	16,485	2,198	3,297	297	115	20	11	79	26	67.4	76.3	81.2	0.2	67.5	59.1	59.9	68.7	63.6	52.2	54.4	64.4	49.5	54.6	54.6	58.3
VIA MARINA																																				
South of Admiralty Way	Residential	4	0	22,620	40	50	0	0	1.8%	0.7%	68.8	16,965	2,262	3,393	305	119	20	11	81	27	67.4	76.3	81.2	0.2	67.7	59.3	60.0	68.8	63.8	52.3	54.5	64.5	49.6	54.7	54.8	58.4
ADMIRALTY WAY																																				
East of Via Marina	Park	4	0	26,250	40	50	0	0	1.8%	0.7%	69.4	19,688	2,625	3,938	354	138	24	13	95	31	67.4	76.3	81.2	0.2	68.3	59.9	60.7	69.5	64.4	53.0	55.2	65.2	50.3	55.4	55.4	59.0
LINCOLN BOULEVARD																																				
North of Fiji Way	Hospital	6	12	40,190	40	50	0	0	1.8%	0.7%	72.6	30,143	4,019	6,029	543	211	36	20	145	48	67.4	76.3	81.2	1.5	71.4	63.1	63.8	72.6	67.5	56.1	58.3	68.3	53.4	58.5	58.6	62.2
FIJI WAY																																				
West of Lincoln Boulevard	Residential	2	0	21,190	35	50	0	0	1.8%	0.7%	67.0	15,893	2,119	3,179	286	111	19	10	76	25	65.1	74.8	80.0	0.0	65.4	57.8	58.9	66.9	61.5	50.8	53.4	62.5	47.4	53.3	53.7	57.0
MINDANAO WAY																																				
East of Lincoln Boulevard	Residential	4	0	17,870	35	50	0	0	1.8%	0.7%	66.5	13,403	1,787	2,681	241	94	16	9	64	21	65.1	74.8	80.0	0.2	65.0	57.3	58.5	66.4	61.1	50.4	53.0	62.0	46.9	52.8	53.2	56.5
MARQUESAS WAY																																				
East of Via Marina	Residential	2	0	2,360	30	50	0	0	1.8%	0.7%	56.7	1,770	236	354	32	12	2	1	8	3	62.5	73.1	80.3	0.0	54.0	47.2	50.3	56.1	50.1	40.3	44.8	51.5	35.9	42.7	45.0	47.4
PANAY WAY																																				
East of Via Marina	Residential	2	6	2,610	30	50	0	0	1.8%	0.7%	57.1	1,958	261	392	35	14	2	1	9	3	62.5	73.1	80.3	0.0	54.4	47.7	50.8	56.6	50.5	40.7	45.3	52.0	36.4	43.2	45.5	47.8
PALAWAN WAY																																				
South of Washington Boulevard	Recreation	4	12	8,610	30	50	0	0	1.8%	0.7%	62.8	6,458	861	1,292	116	45	8	4	31	10	62.5	73.1	80.3	0.5	60.1	53.4	56.4	62.3	56.2	46.4	50.9	57.7	42.1	48.9	51.2	53.5
TAHITI WAY																																				
East of Via Marina	Residential	2	0	1,490	30	50	0	0	1.8%	0.7%	54.7	1,118	149	224	20	8	1	1	5	2	62.5	73.1	80.3	0.0	52.0	45.2	48.3	54.1	48.1	38.3	42.8	49.5	33.9	40.7	43.0	45.4

(1) Alpha Factor: Coefficient of absorption relating to the effects of the ground surface. An alpha factor of 0 indicates that the site is an acoustically "hard" site such as aspalt. An alpha factor of 0.5 indicates that the site is an acoustically "soft" site such as vegetative ground cover.

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	75.00%	10.00%	15.00%
Medium-Duty Trucks	75.00%	5.00%	20.00%
Heavy-Duty Trucks	75.00%	7.00%	17.00%

APPENDIX 5.3

Hydrology Reports

Hydrology Report
For
Woodfin Suite Hotel

City of Marina Del Rey
Los Angeles County, California

Hunsaker Project No:
0084-001-001
Prepared: July 17, 2006

Woodfin Suite Hotel
12730 High Bluff Drive
San Diego, California 92130

Prepared by:

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26074 Avenue Hall Suite 22
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Telephone: (661) 294-2211 Fax: (661) 294-9890

Under the direction of:

Jason H. Fukumitsu, P.E. RCE 40695 Exp: 03/13/07

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8. APPENDICES

   A: 50-Year 24-Hour Isohyet (LACDPW)

   B: Field reconnaissance showing the existing parcel 9U conditions

1. INTRODUCTION

1.1 Project Description

Woodfin Suite Hotel is planning to develop a 288-room hotel on Parcel 9U in the City of Marina Del Rey, California. The proposed development is in the County of Los Angeles and will be located between north of Tahiti Way and west of Basin B in Marina Del Rey. Via Marina runs along the west side of the project site and there is an existing residential development on the north.

The proposed 19-story hotel development will also have meeting rooms, an outdoor pool, spa, a restaurant and a bar. A one-level parking garage will also be constructed on-site, with one level below grade.

The project site covers approximately 3.66 acres and includes an excavated depression that currently serves as a wetland area. The existing wetland supports various native and non-native plant types and will eventually be restored into a wetland park, containing a coastal salt marsh habitat. This habitat will function as a host for native plants and also provide for enhanced wildlife development.

The entire site is characterized as an artificial basin, created from previous dredging and construction efforts many years ago. The existing drainage basin is approximately 3.2 acres and because much of the substrate in the basin is made up of sand, the high rate of percolation results in minimal ponded conditions. Therefore, surface runoff is minimal and is collected in the wetlands area. Runoff from the proposed condition will be collected in an on-site storm drain system and routed to the adjacent Marina, away from the wetland park.

1.2 Report Summary

The purpose of this Hydrology Study is to compare the stormwater runoff in both the existing and proposed conditions. All surface runoff will be routed via an onsite storm drain system and into the Marina. The proposed wetland park will not receive any stormwater runoffs from the development itself.

The report is divided into 7 sections:

Section 1 presents the summary and description of the project

Section 2 presents the methodology used in the Hydrology study.

Section 3 presents the design criteria used in the Hydrology study.

Section 4 presents the Standard Urban Stormwater Mitigation Plan Calculations for this study

Section 5 presents the list of external references used to prepare this hydrologic study

Section 6 summarizes the project site's time of concentration results for the existing and proposed hydrologic conditions

Section 7 contains the exhibits that detail the drainage basins for the project site in both the existing and proposed conditions

Section 8 presents the technical data supplement used in this hydrologic study

Section 9 presents photographs taken of Parcel 9U showing the existing conditions

2. METHODOLOGY

Storm water runoff rates from the project site were determined based on the methods described in the Los Angeles County Department of Public Works (LACDPW) Hydrology Manual, January 2006.

Due to the small size of the drainage basin, the Rational Method was chosen in this analysis. Subsequently, only one drainage sub-basin was developed based on the surrounding topography and proposed site layout. The drainage area times of concentration for both conditions were computed based on a series of design criteria as mentioned in the following section.

A summary of the time of concentration calculation by the Rational Method can be found in Section 6, Tables 6.1 and 6.2.

3. DESIGN CRITERIA

Los Angeles County dictates that several design criteria be followed when using the Rational Method to determine the storm water runoff for the project site. The following is a summary of the criteria used:

Hydrology Method:	Rational Method
Design Storm:	50-Year, 24-Hour
Isohyet:	5.2 inches
Soil Type:	17
Development Classification:	Commercial
Imperviousness:	100%

4. STANDARD URBAN STORMWATER MITIGATION PLAN VOLUME AND FLOWRATE CALCULATIONS

Method for calculating Standard Urban Stormwater Mitigation Plan Flow Rates and Volume based on 0.75 inches of rainfall

Project Name: Woodfin Suites Hotel

4. STANDARD URBAN STORMWATER MITIGATION PLAN VOLUME AND FLOWRATE CALCULATION

NOMENCLATURE

A_I = Impervious Area (acres)
A_P = Pervious Area (acres)
A_U = Contributing Undeveloped Upstream Area (acres)
A_{Total} = Total Area of Development and Contributing Undeveloped Upstream Area (acres)
C_D = Developed Runoff Coefficient
C_U = Undeveloped Runoff Coefficient
I_X = Rainfall Intensity (inches / hour)
Q_{PM} = Peak Mitigation Flow Rate (cfs)
T_C = Time of Concentration (minutes, must be between 5-30 min.)
V_M = Mitigation Volume (ft^3)

EQUATIONS

$A_{Total} = A_I + A_P + A_U$

$A_I = (A_{Total} * \%$ of Development which is Impervious)

$A_P = (A_{Total} * \%$ of Development which is Pervious)

$A_U = (A_{Total} * \%$ of Contributing Undeveloped Upstream Area***)

$C_D = (0.9 * \text{Imp.}) + [(1.0 - \text{Imp.}) * C_U]$ If C_D C_U, use $C_D = C_U$

$Q_{PM} = C_D * I_X * A_{Total} * (1 \text{ hour} / 3{,}600 \text{ seconds}) * (1 \text{ ft} / 12 \text{ inches}) * (43{,}560 \text{ ft}^2 / 1 \text{ acre})$
$= C_D * I_X * A_{Total} * (1.008333 \text{ ft}^3\text{-hour / acre-inches-seconds})$

$T_C = 10^{-0.507} * (C_D * I_X)^{-0.519} * \text{Length}^{0.483} * \text{Slope}^{-0.135}$

$V_M = (0.75 \text{ inches}) * [(A_I)(0.9) + (A_P + A_U)(C_U)] * (1 \text{ ft} / 12 \text{ inches}) * (43{,}560 \text{ ft}^2 / 1 \text{ acre})$
$= (2{,}722.5 \text{ ft}^3 / \text{acre}) * [(A_I)(0.9) + (A_P + A_U)(C_U)]$

***** Contributing Undeveloped Upstream Area is an area where stormwater runoff from an undeveloped upstream area will flow directly or indirectly to the Post-Construction Best Management Practices (BMPs) proposed for the development. This additional flow must be included in the flow rate and volume calculations to appropriately size the BMPs.**

4. STANDARD URBAN STORMWATER MITIGATION PLAN VOLUME AND FLOWRATE CALCULATION

PROVIDE PROPOSED PROJECT CHARACTERISTICS

A_{Total}	2.40	Acres
Type of Development	COMMERCIAL	
Predominate Soil Type #	17	
% of Project Impervious	100	
% of Project Pervious	0	
% of Project Contributing Undeveloped Area	0	
A_I	2.40	Acres
A_P	0	Acres
A_U	0	Acres

4. STANDARD URBAN STORMWATER MITIGATION PLAN VOLUME AND FLOWRATE CALCULATION

DETERMINING THE PEAK MITIGATED FLOW RATE (Q_{PM}):

In order to determine the peak mitigated flow rate (Q_{PM}) from the new development, use the Los Angeles County Department of Public Works *Hydrology Manual*. Use the Modified Rational Method for calculating the peak mitigation Q_{PM} for compliance with the Standard Urban Stormwater Mitigation Plan (SUSMP). Use attached **Table 1** for all maximum intensity (I_X) values used.

By trial and error, determine the time of concentration (T_C), as shown below:

CALCULATION STEPS:

1. Assume an initial T_C value between 5 and 30 minutes.

T_C 10 minutes

2. Using Table 1, look up the assumed T_C value and select the corresponding I_X intensity in inches/hour.

I_X 0.323 inches/hour

3. Determine the value for the Undeveloped Runoff Coefficient, C_U, using the runoff coefficient curve corresponding to the predominant soil type.

C_U 0.3

4. Calculate the Developed Runoff Coefficient, $C_D = (0.9 * \text{Imp.}) + [(1.0 - \text{Imp.}) * C_U]$

C_D 0.9

5. Calculate the value for $C_D * I_X$

$C_D * I_X$ 0.291

6. Calculate the time of concentration, $T_C = 10^{-0.507} * (C_D * I_X)^{-0.519} * \text{Length}^{0.483} * \text{Slope}^{-0.135}$

Calculated T_C 24.3 minutes

7. Calculate the difference between the initially assumed T_C and the calculated T_C, if the difference is greater than 0.5 minutes. Use the calculated T_C as the assumed initial T_C in the second iteration. If the T_C value is within 0.5 minutes, round the acceptable T_C value to the nearest minute.

4. STANDARD URBAN STORMWATER MITIGATION PLAN VOLUME AND FLOWRATE CALCULATION

TABLE FOR ITERATIONS:

Iteration No.	Initial T_C (min)	I_X (in/hr)	C_U	C_D	C_D*I_X (in/hr)	Calculated T_C (min)	Difference (min)
1	10	0.323	0.3	0.9	0.291	24.3	14.3
2	25	0.210	0.1	0.9	0.189	30.4	5.4
3	30	0.193	0.1	0.9	0.174	31.7	1.7
4							
5							
6							
7							
8							
9							
10							

Acceptable T_C value 30 minutes

8. Calculate the Peak Mitigation Flow Rate,
   $Q_{PM} = C_D * I_X * A_{Total} * (1.008333\ ft^3\text{-hour / acre-inches-seconds})$

Q_{PM} 0.42 cfs

10

4. STANDARD URBAN STORMWATER MITIGATION PLAN VOLUME AND FLOWRATE CALCULATION

TABLE 1

INTENSITY - DURATION DATA FOR 0.75-INCHES OF RAINFALL
FOR ALL RAINFALL ZONES

Duration, T_C (min)	Rainfall Intensity, I_X (in/hr)
5	0.447
6	0.411
7	0.382
8	0.359
9	0.339
10	0.323
11	0.309
12	0.297
13	0.286
14	0.276
15	0.267
16	0.259
17	0.252
18	0.245
19	0.239
20	0.233
21	0.228
22	0.223
23	0.218
24	0.214
25	0.210
26	0.206
27	0.203
28	0.199
29	0.196
30	0.193

DETERMINING THE VOLUME (V_M)

4. STANDARD URBAN STORMWATER MITIGATION PLAN VOLUME AND FLOWRATE CALCULATION

In order to determine the volume (V_M) of stormwater runoff to be mitigated from the new development, use the following equation:

$$V_M = (2{,}722.5\ ft^3 / acre) * [(A_I)(0.9) + (A_P + A_U)(C_U)]$$

$$V_M = (2{,}722.5\ ft^3 / acre) * [(2.4)(0.9) + 0]$$

$$V_M = 5880.6\ ft^3$$

5. REFERENCES

Los Angeles County Department of Public Works Hydrology Manual, January 2006

TABLES

Table 6.1

Existing Conditions

Tc Equation
Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Project	Subarea	Area (acres)	%imp	Frequency	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc-calculated (min.)	Intensity (in./hr)	Cu	Cd	Flowrate (cfs)
Woodfin Suites Hotels	A	3.2	98	50	17	650	0.02	5.2	8	2.49	0.87	0.9	7.17

Calculations determined from LACDPW Tc Calculator

Table 6.2

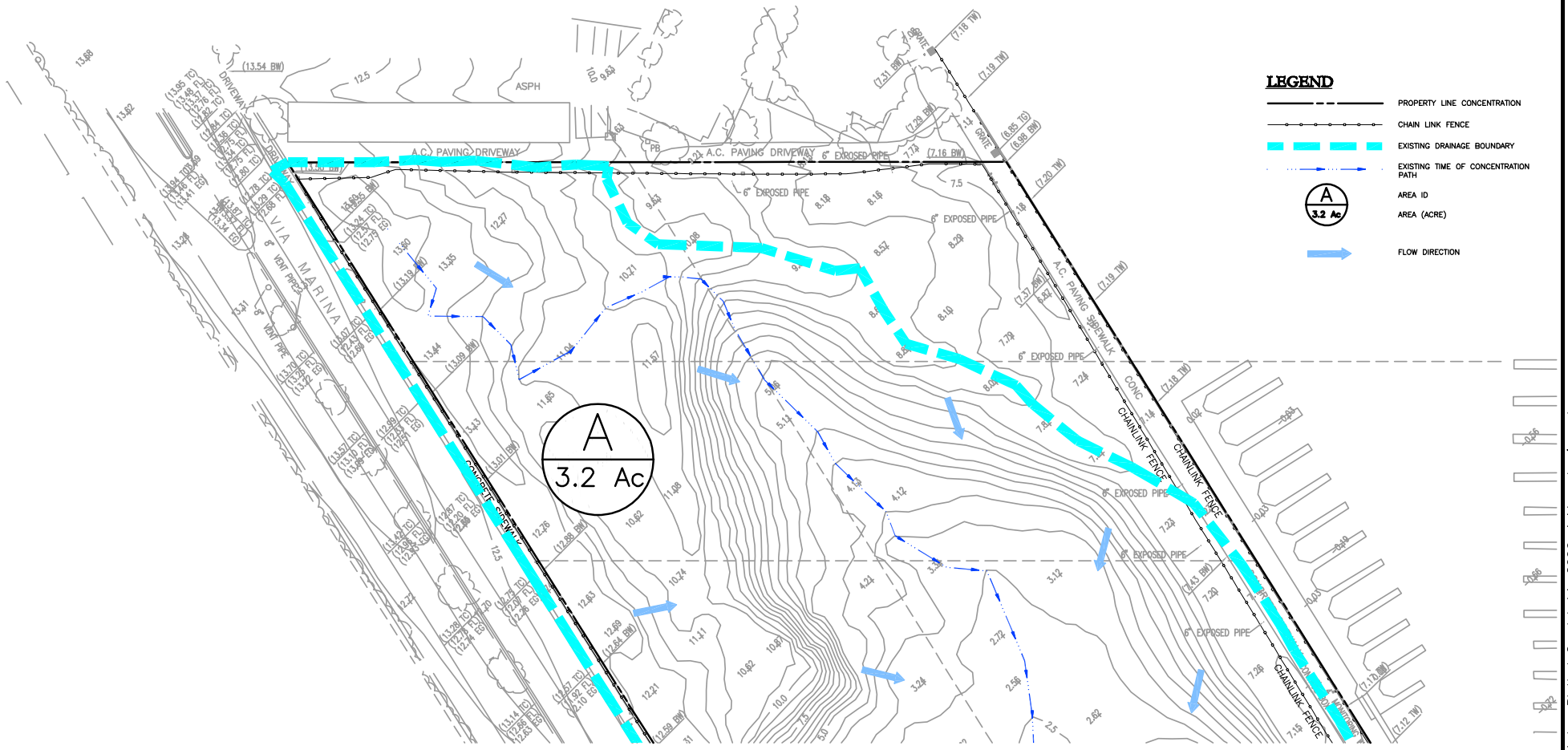
Proposed Conditions

Tc Equation
Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Project	Subarea	Area (acres)	%imp	Frequency	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc-calculated (min.)	Intensity (in./hr)	Cu	Cd	Flowrate (cfs)
Woodfin Suites Hotels	A	2.4	100	50	17	520	0.005	5.2	9	2.35	0.86	0.9	5.08

Calculations determined from LACDPW Tc Calculator

EXHIBITS



FEET
50 25 0 50 100
1 1/2 0 1 2
INCHES

EXISTING CONDITIONS HYDROLOGY MAP
WOODFIN SUITES HOTELS, PARCEL 9U
CITY OF MARINA DEL REY

WOODFIN SUITES HOTELS
12730 HIGH BLUFF DRIVE
SAN DIEGO, CALIFORNIA 92130

HUNSAKER & ASSOCIATES
LOS ANGELES, INC.
PLANNING · ENGINEERING · SURVEYING
26074 Avenue Hall, Suite #22 · Valencia, CA 91355
FX: (661) 294-9890 · PH: (661) 294-2211

DATE: 07/16/06 REVISED ON:
WORK ORDER: 0084-001-001 SHEET 1 OF 2

HWH001-01.DWG

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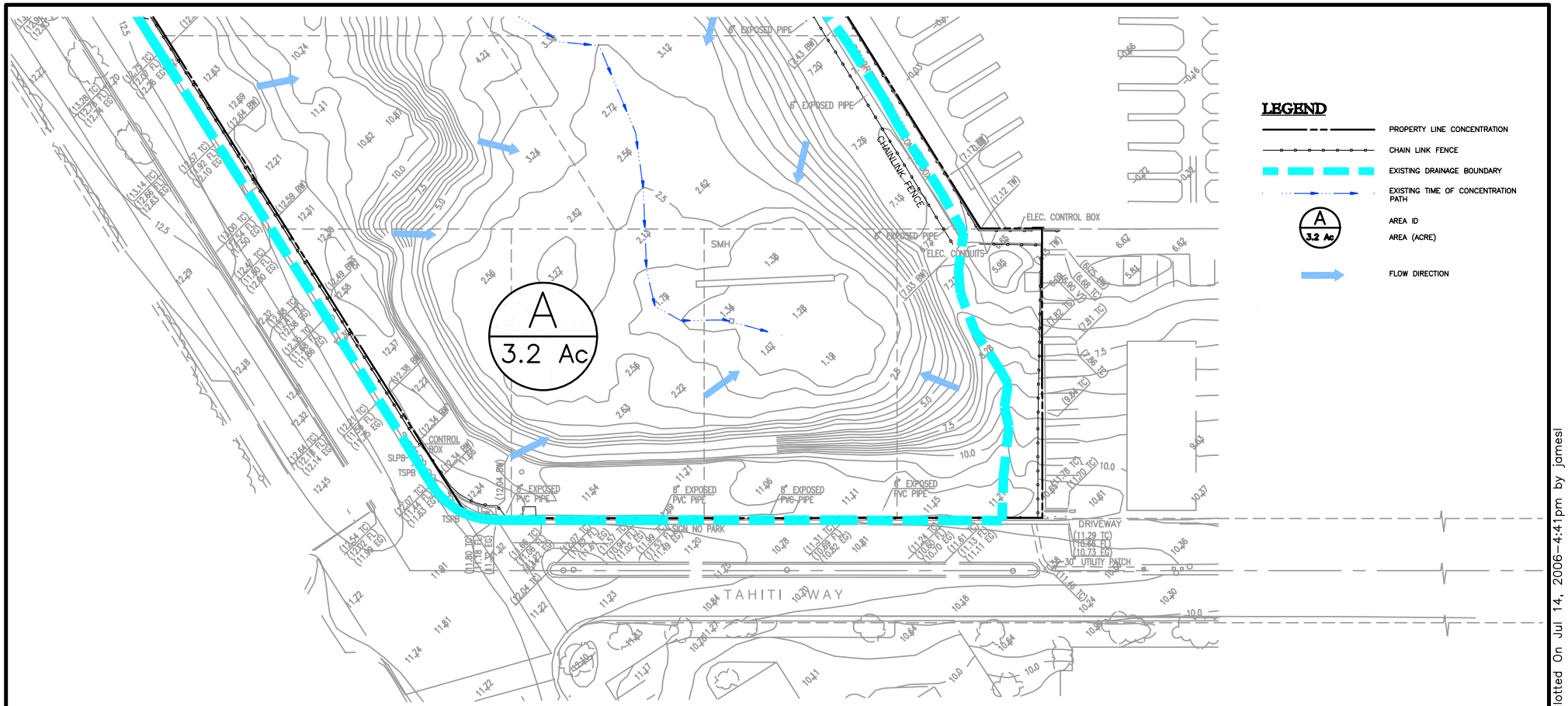

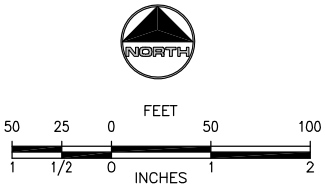

WOODFIN SUITES HOTELS
12730 HIGH BLUFF DRIVE
SAN DIEGO, CALIFORNIA 92130

EXISTING CONDITIONS HYDROLOGY MAP
WOODFIN SUITES HOTELS, PARCEL 9U
CITY OF MARINA DEL REY

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DATE: 07/16/06 REVISED ON:
WORK ORDER: 0084-001-001 SHEET 2 OF 2

HWH001-02.DWG

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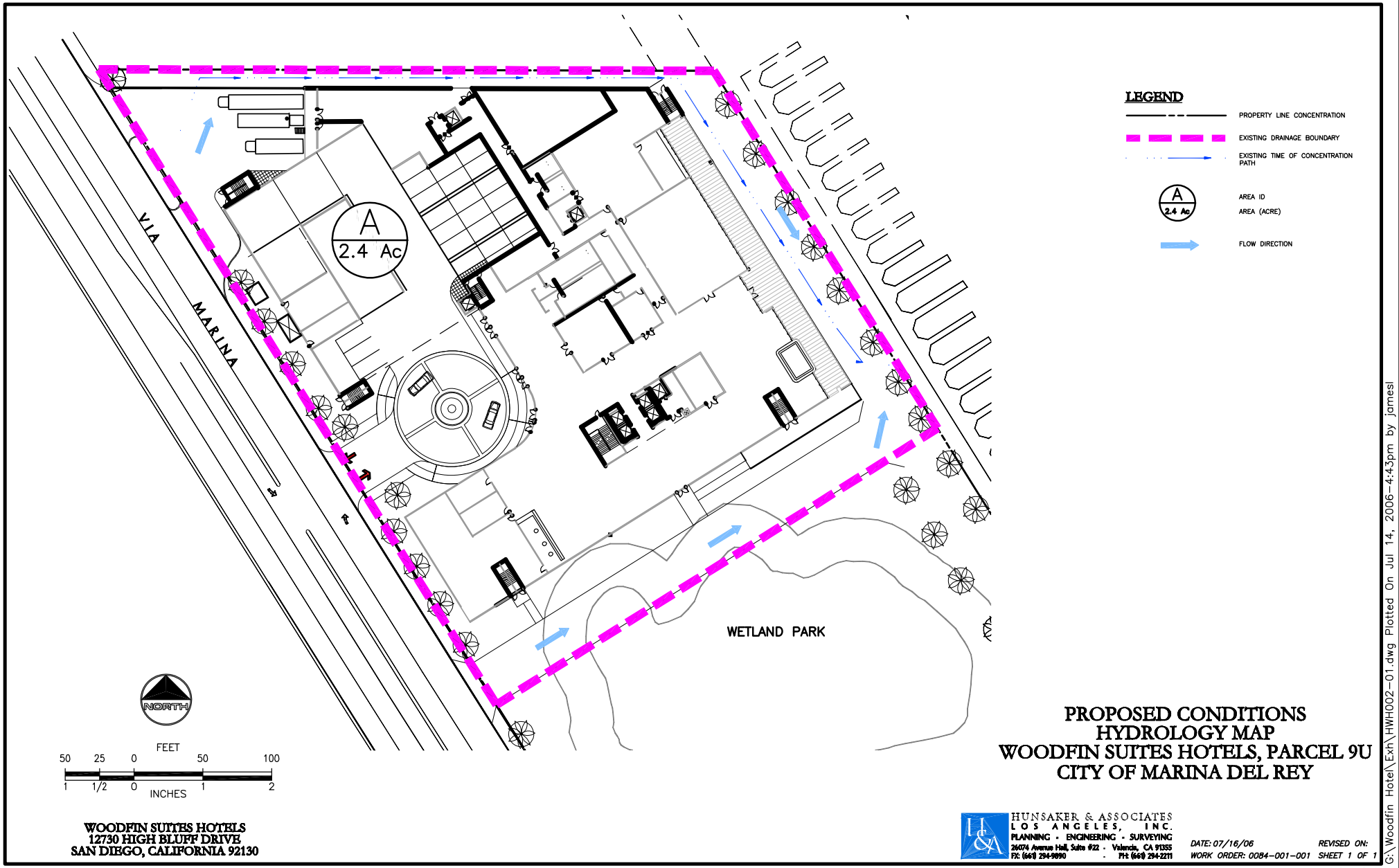

PROPOSED CONDITIONS HYDROLOGY MAP WOODFIN SUITES HOTELS, PARCEL 9U CITY OF MARINA DEL REY

WOODFIN SUITES HOTELS
12730 HIGH BLUFF DRIVE
SAN DIEGO, CALIFORNIA 92130

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WORK ORDER: 0084-001-001 SHEET 1 OF 1

HWH002-01.DWG

G:\Woodfin Hotel\Exh\HWH002-01.dwg Plotted On Jul 14, 2006-4:43pm by jamesl

APPENDICES

34º 00' 00"

BEVERLY HILLS 1-H1.17

-118º 30' 00"

INGLEWOOD 1-H1.8

-118º 22' 30"

REDONDO BEACH 1-H1.3

33º 52' 30"

N
W E
S

016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

V E N I C E

50-YEAR 24-HOUR ISOHYET

1-H1.7

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

Field Reconnaissance of the Existing Parcel 9U Conditions

Looking North of the Existing Parcel

Looking West of the Existing Parcel

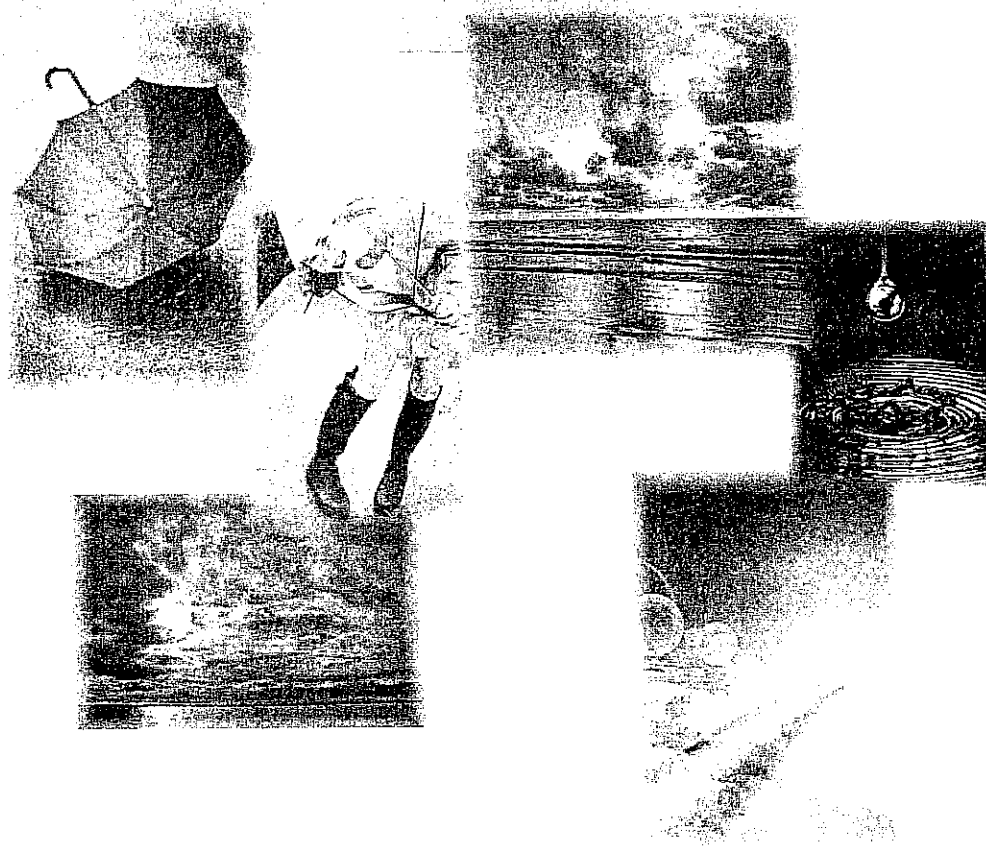
Field Reconnaissance of the Existing Parcel 9U Conditions

Looking West of the Wetlands in the Existing Parcel

Looking East of the Existing Parcel

Fuscoe Engineering Hydrology Report (2004)

ATTN MINTA



NEPTUNE MARINA

Marina Del Rey, CA

Prepared for:

LEGACY PARTNERS

30 Executive Park, Suite 100
Irvine, CA 92614

Project Manager:
John Olivier

Date Prepared: February 2004
JN: 424.14.01

Prepared by:

FUSCOE ENGINEERING, INC.

16795 Von Karman Avenue, Suite 100
Irvine, CA 92606
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2.2 Existing Storm Drain Facilities 3

3.0 PROPOSED STORM DRAIN FACILITIES 3

4.0 HYDROLOGY STUDY (LOCAL STORM DRAINS) 3

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Appendix 1 25-Year Hydrology Study

Appendix 2 Q For 0.75" Rainfall First Flush

Appendix 3 Existing Hydrology Map

Appendix 4 Proposed Hydrology Map

Prepared by:

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Project Number:
424.14.01

Supervising Engineer:

John Olivier

RCE No. 044568

Date Prepared:

February 2004

1.0 INTRODUCTION

1.1 Geographic Setting

The study area consists of 13 acres ± and is located in the Marina Del Rey area of Los Angeles County. The project site lies east of Via Marina, north of Tahiti Way and south of Marquesas Way with a small 2 acre ± portion of the site lying north of Marquesas Way. Basins B and C of the Marina form a portion of the site boundary.

1.2 Purpose of This Report

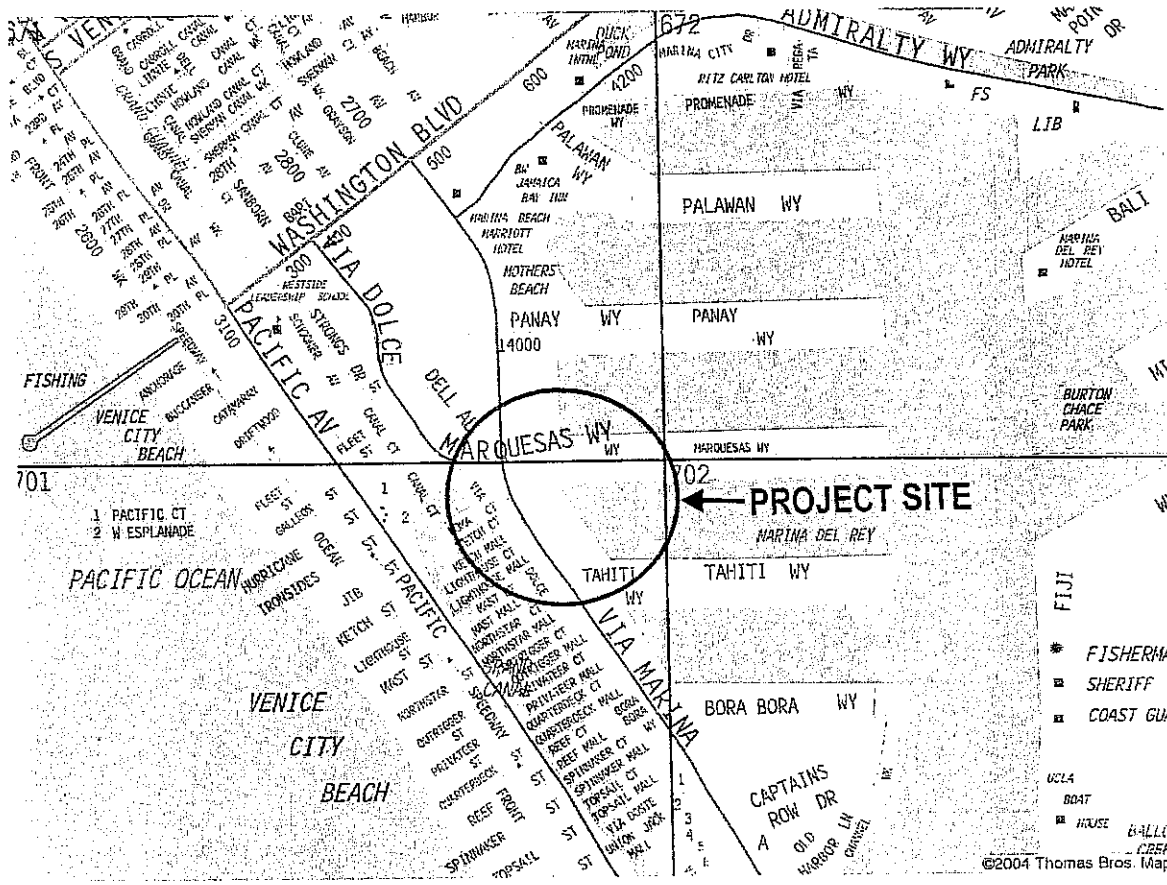
The purpose of this report is as follows:

- To comply with the Marina Del Rey Specific Plan.
- To provide Q_{25} peak discharge rates per the County of Los Angeles Public Works Addendum to the 1991 Hydrology/Sedimentation Manual.
- To support preparation of the environmental assessment.

1.3 References

- Los Angeles County 1991 Hydrology Manual
- Addendum to the 1991 Hydrology Manual and TC Calculator

Project Site Location Map



Thomas Brothers, 2003

2.0 EXISTING TOPOGRAPHIC & HYDROLOGIC CONDITIONS

2.1 Existing Topography

The site can be divided into three distinct areas. The southern most area is undeveloped vacant land that slopes at about 2% in the southeasterly direction. The central area is currently an apartment complex. A portion of the apartment site drains south to Basin 'B' and a portion flows east to Basin 'B'. The existing grade slopes about 2%. The northern most area is an existing parking lot and flows north easterly at less than 2% to Basin 'C'.

2.2 Existing Storm Drain Facilities

The existing storm drain facility consists of a series of grated inlets in the sidewalk area along the edge of the marina bulkhead. The inlets flow directly to the ocean (Basin 'B' & 'C') via pipes through the bulkhead.

3.0 PROPOSED STORM DRAIN FACILITIES

The proposed apartment site will surface flow toward the marina bulkhead and will drain to a set of grated inlets similar to the existing. The drainage will continue to flow to the sea through existing bulkhead drains. With the proposed project the existing walkways and grates will be replaced, revitalizing the area, but retaining the existing storm drain outfalls.

The park and hotel sites will utilize the same type of walkway and grated inlet system with drainage through the existing bulkhead.

4.0 HYDROLOGY STUDY (LOCAL STORM DRAINS)

4.1 Storm Frequency

Q_{25} was determined for storm drain design purposes. The first flush (0.75" Rain fall) Q was determined for sizing of any Best Management Practices (BMP's) required by the project conditions of approval.

4.2 Methodology

The study was prepared in conformance with the Los Angeles County Hydrology Manual Addendum and TC Calculator. Proposed areas were configured according to land use. The percent impervious was assigned from the Hydrology Manual. When actual storm drain design is started, areas can be divided into sub areas and Q_{25} figured on a proportional basis per current LACFCD Practice.

Copies of the Hydrology TC Calculator results are included in this report in Appendix 1 and 2.

5.0 RESULTS AND CONCLUSIONS

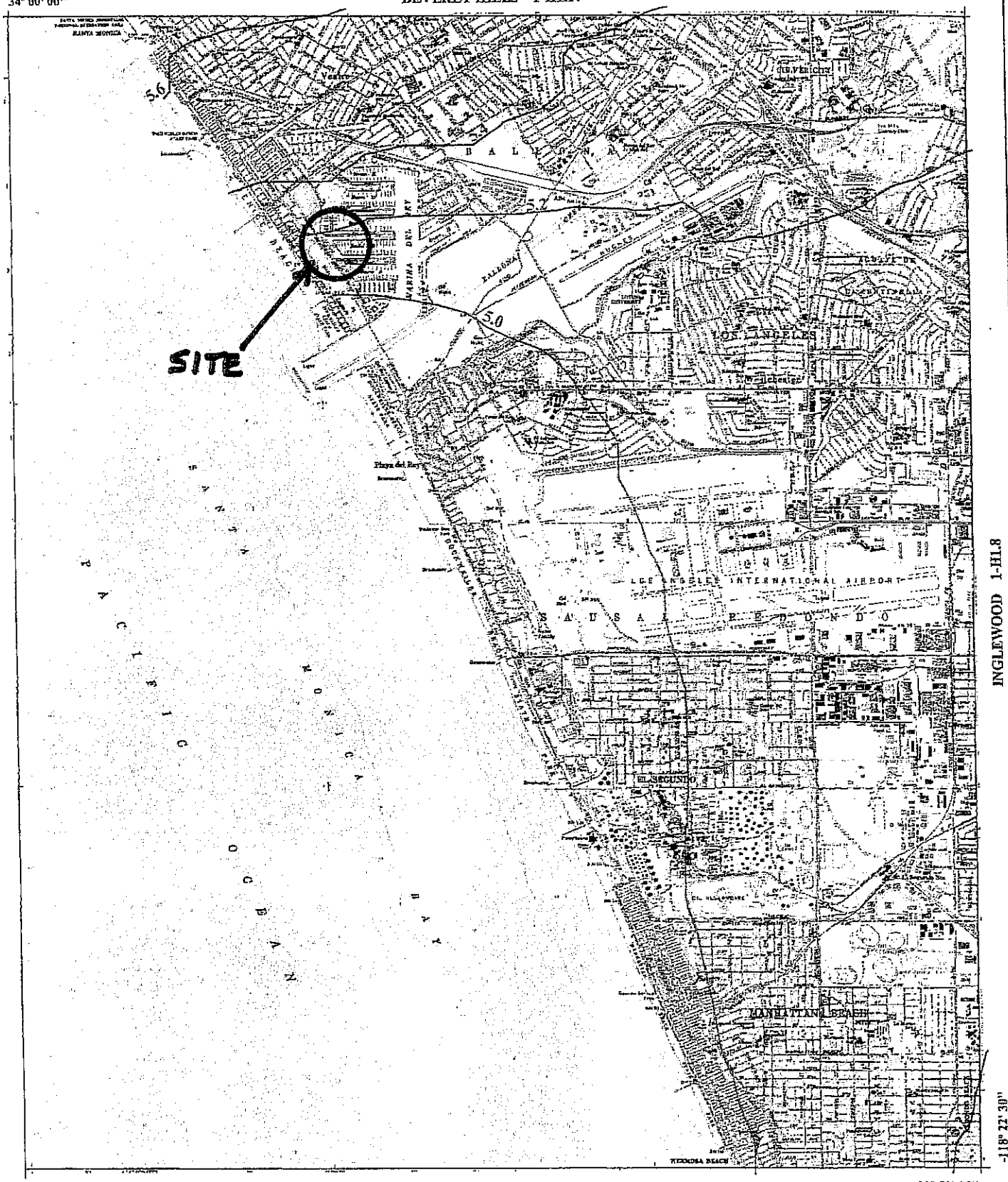
5.1 Previous Hydrology Report

The existing and proposed hydrology for the proposed apartment areas are the same. There is no net change in run-off due to the development.

The proposed park and hotel site existing hydrology is 7cfs peak run-off. A portion of this flow currently ponds on site. With the proposed development, the peak run-off amount increases to 8cfs. In the developed state, this 8cfs would be conveyed through a new onsite drainage system directly to Basin 'B'.

6.0 APPENDICES

Appendix 1	25-Year Hydrology Study
Appendix 2	Q For 0.75" Rainfall First Flush
Appendix 3	Existing Hydrology Map
Appendix 4	Proposed Hydrology Map



1 0 1 2 Miles

N W E S

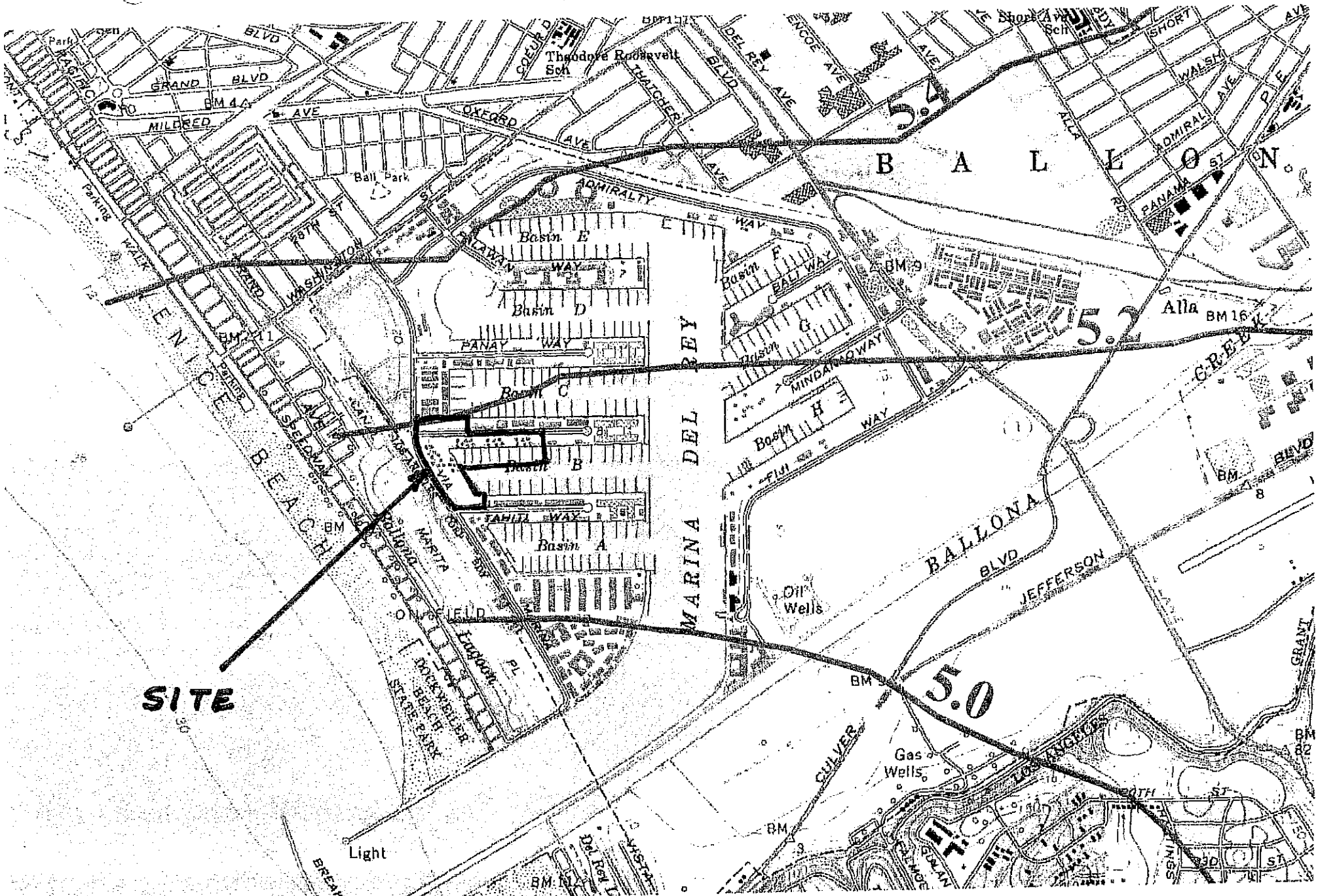
7.2 INCHES OF RAINFALL

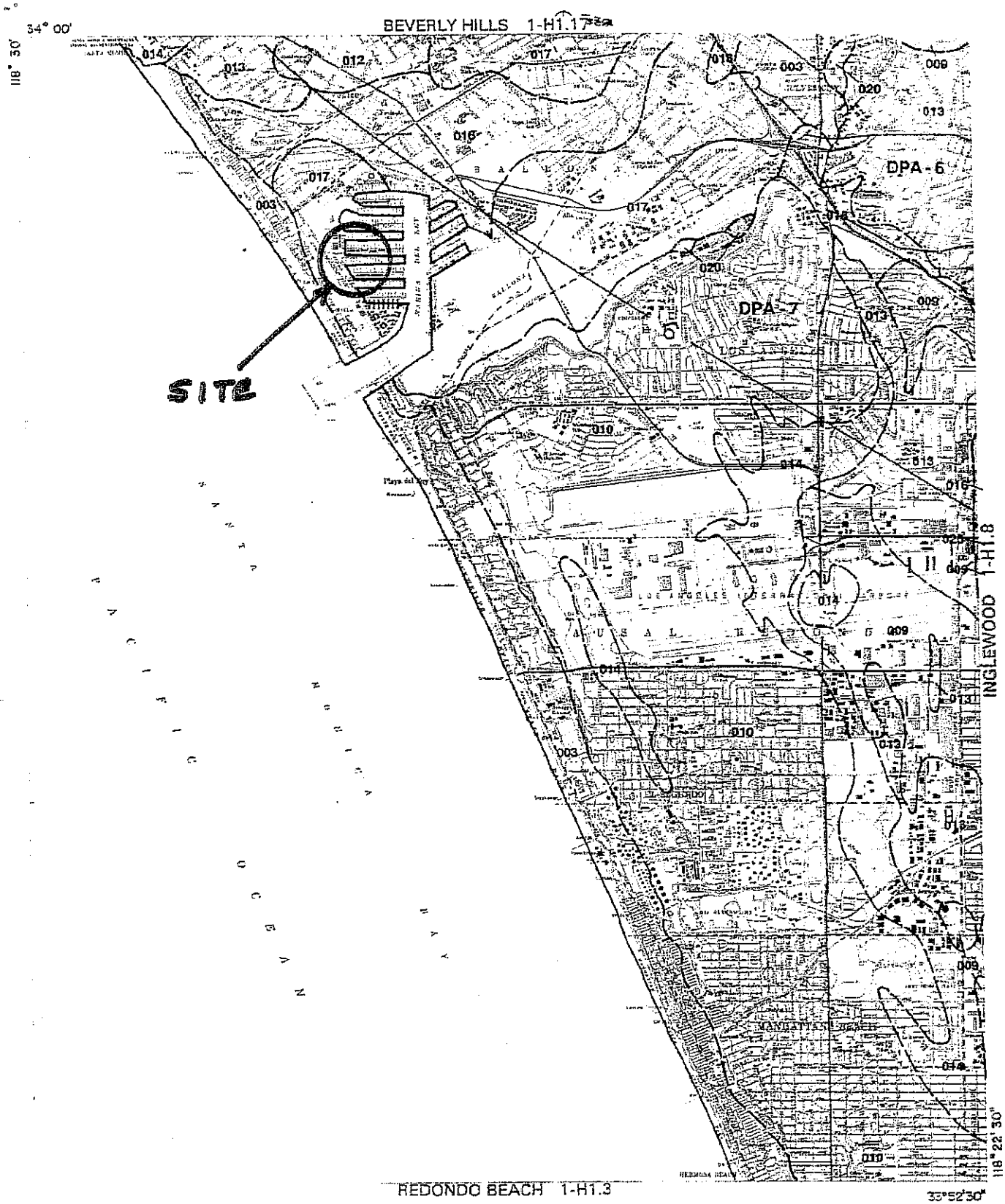
25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

V E N I C E 1-H1.7

50-YEAR 24-HOUR ISOHYET

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works


SITE
MARINA DEL REY
VENICE BEACH
BALLONA
BALLONA BLVD
JEFFERSON
Basin A
Basin B
Basin C
Basin D
Basin E
Basin F
Basin G
Basin H
PANAY WAY
TAHITI WAY
BALI WAY
MINDANAO WAY
ADMIRALTY WAY
DELAWARE WAY
FIJI WAY
Theodore Roosevelt Sch
Ball Park
Oil Wells
Gas Wells
Light
ROCKEFELLER BEACH STATE PARK
Alla
5.4
5.2
5.0



LEGEND

——— SOIL CLASSIFICATION AREA

····· DEBRIS POTENTIAL AREA

(K) RAINFALL ZONE

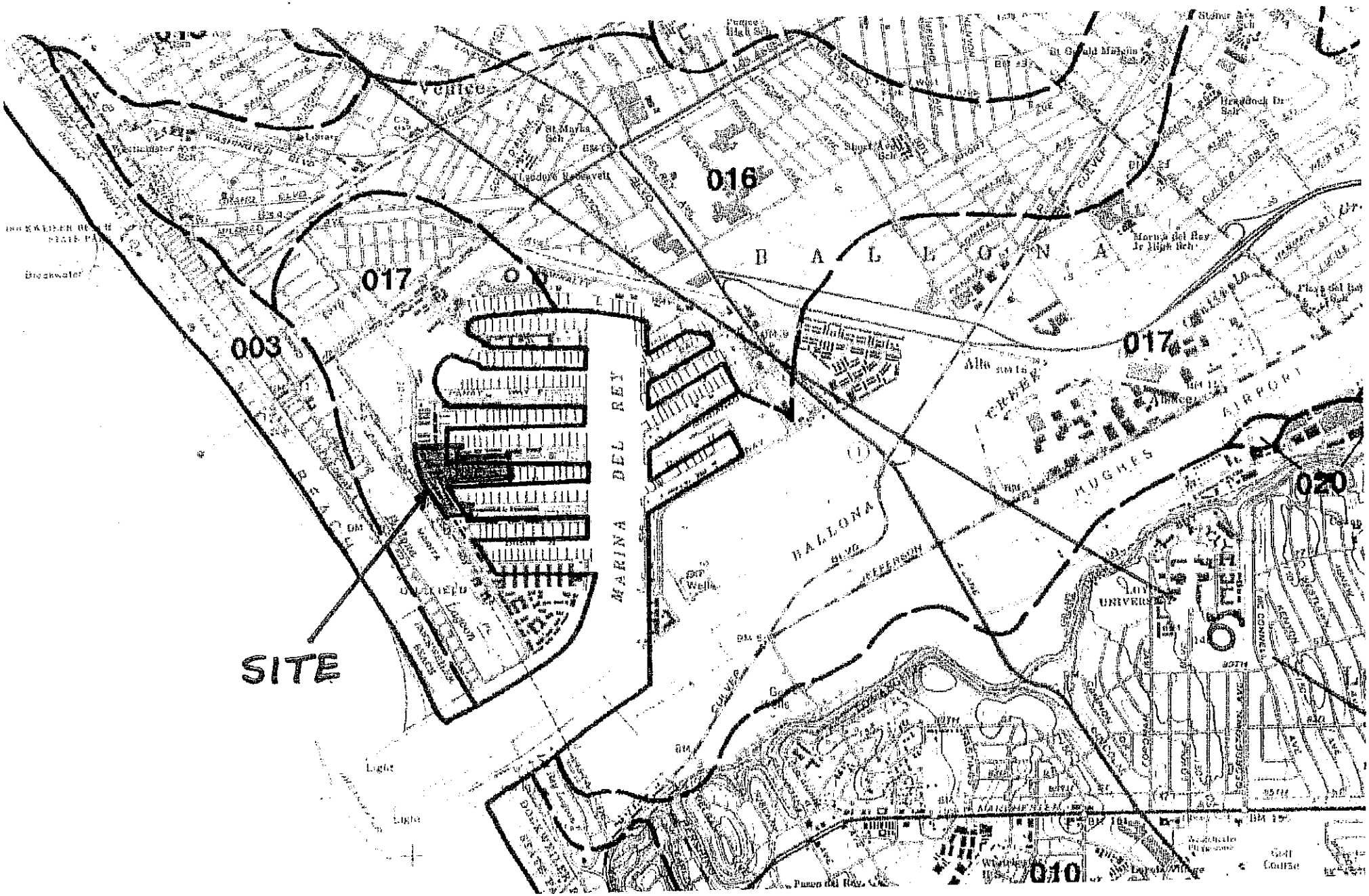
—12— 50-YEAR ISOHYET (MAX. 24-HOUR AMOUNT)

LACDPW

VENICE 1981

hydrologic map

0 FEET 5000


016
017
003
017
020
010
SITE
MARINA DEL REY
BALLONA
HUGHES
AIRPORT
Venice
Breakwater
Light
Light

$C_D = (0.9 * IMP) + (1.0 - IMP) * Cu$

Where: C_D = Developed Runoff Coefficient

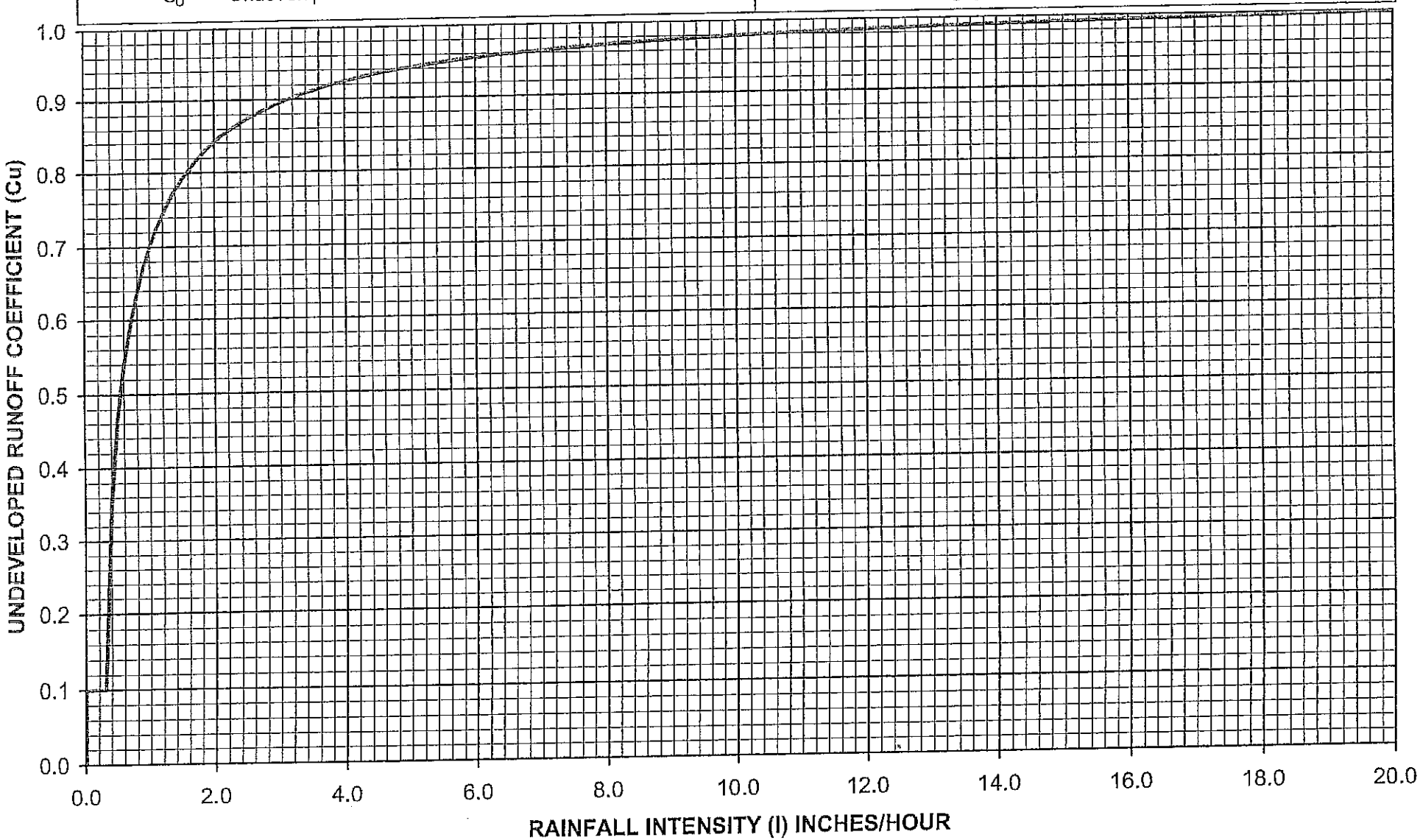
IMP = Proportion Impervious

C_U = Undeveloped runoff coefficient

Los Angeles County Department of Public Works

RUNOFF COEFFICIENT CURVE

SOIL TYPE NO. 017



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PROJECT: NEPTUNE MARINA		PROJECT NO: 424.1401	
BY: JEL	DATE: 2-26-04	CHECK:	DATE:

L.A. COUNTY HYDROLOGY CALCULATIONS

EXISTING HYDROLOGY

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR = 0.878

50-YEAR ISOHYET = 5.2

25-YEAR = 5.2(0.878)

= 4.5656

AREA	A	3.67AC	100%	7cfs
	A-1	2.87AC	78.2%	5.48 cfs
	A2	0.61AC	16.6%	1.16 cfs
	A3	0.19AC	5.2%	0.36

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
A	3.67	.01	17	4.5656	507	.0239

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
1a	3.67	0.01	17	4.5656	507	0.0239

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A	2.33	0.86	0.86

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Tc Value (min.)	Flowrate (cfs)
7	7

Calculate Tc

Cancel

EXISTING SITE - UNDEVELOPED

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
B	7.31	.855	17	4.5656	359	.0209

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
1a	7.31	0.855	17	4.5656	359	0.0209

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
B	2.5	0.87	0.9

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Calculate Tc

Cancel

Tc Value (min.)	Flowrate (cfs)
6	16

EXISTING SITE - APARTMENTS

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
C	2.07	.946	17	4.5656	548	0.0157

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
1a	2.07	0.946	17	4.5656	548	0.0157

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
C	2.18	0.85	0.9

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Tc Value (min.)	Flowrate (cfs)
8	4

Calculate Tc

Cancel

EXISTING SITE - PARKING LOT

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
A	1.67	.85	17	4.5656	360	.02

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
1a	1.67	0.85	17	4.5656	360	0.02

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A	2.5	0.87	0.9

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Calculate Tc

Cancel

Tc Value (min.)	Flowrate (cfs)
6	4

PROPOSED HOTEL SITE

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
B	2.00	.150	17	4.5656	378	.02

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
1a	2	0.15	17	4.5656	378	0.02

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
B	2.5	0.87	0.87

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Calculate Tc

Cancel

Tc Value (min.)	Flowrate (cfs)
6	4

PROPOSED PARK SITE

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
C	7.31	.855	17	4.5656	391	.02

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
1a	7.31	0.855	17	4.5656	391	0.02

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
C	2.5	0.87	0.9

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Calculate Tc

Cancel

Tc Value (min.)	Flowrate (cfs)
6	16

PROPOSED APARTMENT SITE TO BASIN 'B'

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
D	2.07	.855	17	4.5656	571	.02

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
1a	2.07	0.855	17	4.5656	571	0.02

Input File

- [ ] Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

- ○ Calculate Single Tc From Subarea Parameters Provided In Input File
- ◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
D	2.18	0.85	0.89

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Calculate Tc

Cancel

Tc Value (min.)	Flowrate (cfs)
8	4

PROPOSED APARTMENT SITE TO BASIN 'C'

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
A	1.67	.958	17	0.75	335	.02

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
1a	1.67	0.958	17	0.75	335	0.02

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A	0.23	0.1	0.87

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Calculate Tc

Cancel

Tc Value (min.)	Flowrate (cfs)
20	0

PROPOSED HOTEL SITE - FIRST FLUSH

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
B	2.00	0.15	17	0.75	378	0.02

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
1a	2	0.15	17	0.75	378	0.02

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
B	0.19	0.1	0.22

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Calculate Tc

Cancel

Tc Value (min.)	Flowrate (cfs)
30	0

PROPOSED PARK SITE - FIRST FLUSH

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
C	7.31	.855	17	0.75	391	.02

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
1a	7.31	0.855	17	0.75	391	0.02

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
C	0.21	0.1	0.78

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Calculate Tc

Cancel

Tc Value (min.)	Flowrate (cfs)
24	1

PROPOSED APARTMENT SITE - FIRST FLUSH TO BASIN 'B'

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
D	2.07	.855	17	0.75	571	.02

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
1a	2.07	0.855	17	0.75	571	0.02

Input File

- [ ] Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

- ○ Calculate Single Tc From Subarea Parameters Provided In Input File
- ◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
D	0.19	0.1	0.78

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Calculate Tc

Cancel

Tc Value (min.)	Flowrate (cfs)
30	0

PROPOSED APARTMENT SITE – FIRST FLUSH TO BASIN 'C'

APPENDIX 5.4

Air Quality

LST Analysis

Localized Significance Threshold Analysis
for
Neptune Marina Apartments and Anchorage
and
Woodfin Suite Hotel and Timeshare Resort

Prepared for:

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and

Woodfin Suite Hotels, LLC

Prepared by:

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May 2007

Summary

Legacy Partners Residential, Inc. and Woodfin Suite Hotels, LLC have proposed to build residential apartment buildings, boat slips and a hotel and timeshare resort in Marina del Rey. The proposed project consists of four individual components: (1) the Neptune Marina Parcel 10R, (2) the Neptune Marina Parcel FF, (3) the Woodfin Suite Hotel and Timeshare Resort (Parcel 9U North), and (4) the Wetland Park (Parcel 9U South). The project would result in the generation of air pollutants during construction and operation. This study analyzes the impacts of the construction emissions (fugitive dust and motor vehicle and equipment exhaust) on ambient air quality concentrations in the vicinity of the construction site. The ambient air quality impacts are compared to thresholds established by the South Coast Air Quality Management District (SCAQMD). The significance threshold for fine particulate matter less than 10 microns in aerodynamic diameter (PM_{10}) represents compliance with Rule 403 (Fugitive Dust). The threshold for fine particulate matter ($PM_{2.5}$) is intended to constrain emissions so as to aid in progress toward attainment of the ambient air quality standards. The thresholds for nitrogen dioxide (NO_2) and carbon monoxide (CO) represent the allowable increase in concentrations above background levels in the vicinity of the project that would not cause or contribute to an exceedance of the relevant ambient air quality standards.

Localized significance threshold analysis shows that the maximum 24-hour PM_{10} and $PM_{2.5}$ concentrations for Parcel 10R, Parcel FF and the Woodfin Suite Hotel and Timeshare Resort would exceed the thresholds of significance established by SCAQMD at receptors near to the project sites during individual construction of each component. The maximum 1-hour NO_2 concentration for the Woodfin Suite Hotel and Timeshare Resort would also exceed the threshold of significance established by SCAQMD at receptors near to the project sites during individual construction. In addition, the ambient air quality impacts would exceed the 24-hour PM_{10} and $PM_{2.5}$ threshold and the 1-hour NO_2 threshold due to concurrent construction of the combined project components. Individual construction of the Wetland Park is not expected to exceed any of the established thresholds by itself.

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1.0 GENERAL

1.1 Project Description

The proposed project consists of four components. Component 1 includes the landside and waterside development of Neptune Marina Parcel 10R and consists of three apartment buildings totaling 400 units and 174 boat slips. Development of Component 1 would require the removal of 136 existing multi-family residential units and 198 boat slips at Parcel 10R. Demolition is anticipated to commence in January 2009 and last for approximately two months. Grading and construction are anticipated to occur over approximately 3 months and 28 months, respectively.

Component 2 includes the development of Neptune Marina Parcel FF and consists of one apartment building totaling 126 units. Development of Component 2 would require removal of a parking lot, just over two acres in area. The parking lot would be removed about two weeks prior to grading and construction of the Neptune Marina Parcel FF. Demolition is anticipated to commence in January 2009 and last for about half a month. Grading and construction are anticipated to occur over three months and 17 and one-half months, respectively.

Component 3 includes the development of the Woodfin Suite Hotel and Timeshare Resort in Parcel 9U North and consists of a 19-story hotel structure with 288 hotel and timeshare resort. The hotel and timeshare resort is planned on the northern portion of Parcel 9U; the balance of Parcel 9U will be developed as a restored wetland park and is described below as Component 4. Grading for Component 3 is anticipated to begin in January 2009. Grading and construction are anticipated to occur over three months and 21 months, respectively.

Component 4 includes the development of a restored wetland park located on the southern portion of Parcel 9U. The wetland park encompasses approximately 1.46 acres. Grading for Component 4 is anticipated to begin in January 2010. Grading and construction are anticipated to occur over three months and nine months, respectively.

1.2 Regional Air Quality

The project is located in the portion of Los Angeles County in the South Coast Air Basin (Basin). The region is designated as a severe-17 nonattainment area for the federal 8-hour ozone standard and an extreme nonattainment area for the state 1-hour ozone standard. The California Air Resources Board (CARB) has designated the Basin as nonattainment for the state 8-hour ozone standard, but this designation is not yet in effect. It is designated as a serious nonattainment area for the federal 1-hour and 8-hour carbon monoxide (CO) standards and as an attainment area for the state 1-hour and 8-hour CO standards. In addition, it is designated as an attainment/unclassifiable area for the federal nitrogen dioxide (NO_2) standard and as an attainment area for the state NO_2 standard. It has been designated as a

serious nonattainment area for the federal 24-hour respirable particulate matter (PM_{10}) standard and a nonattainment area for the state 24-hour and annual PM_{10} standards. It is also designated as a nonattainment area for the federal 24-hour and annual fine particulate matter ($PM_{2.5}$) standards and the annual state $PM_{2.5}$ standard.[1,2]

1.3 Thresholds of Significance

Table 1, Peak Background Concentrations for SRA 2 for the Period of 2003 to 2005, shows the peak background concentrations of NO_2 and CO in Source Receptor Area (SRA) 2 (Northwest Coastal Los Angeles County) in which the proposed project is located. These are the values on which Localized Significance Threshold (LST) criteria for NO_2 and CO are based.

Table 1
Peak Background Concentrations for SRA 2 for the Period of 2003 to 2005

Pollutant	Averaging Period	Unit	2003	2004	2005	Peak Concentration
Nitrogen Dioxide (NO_2)	1 hour	ppm	0.12	0.09	0.08	0.12
Carbon Monoxide (CO)	1 hour	ppm	5	4	3	5
	8 hours	ppm	2.7	2.3	2.1	2.7

Source: South Coast Air Quality Management District "Historical Data by Year." [Online] [August 2006]. <http://www.aqmd.gov/smog/historicaldata.htm>

Table 2, Localized Significance Criteria, shows the threshold criteria recommended by the SCAQMD for determining whether the emissions resulting from construction of a development project have the potential to generate significant adverse local impacts on ambient air quality. The SCAQMD's concentration-based PM_{10} threshold from its Localized Significance Threshold Methodology (LST Methodology)[3] is a 24-hour average concentration of 10.4 micrograms per cubic meter ($\mu g/m^3$) based on compliance with Rule 403. The threshold for $PM_{2.5}$ is a 24-hour average concentration of 10.4 $\mu g/m^3$ and

1 California Air Resources Board. "Area Designations (Activities and Maps)." [Online] [September 29, 2006]. http://www.arb.ca.gov/desig/desig.htm.

2 U.S. Environmental Protection Agency. "Region 9: Air Programs, Air Quality Maps." [Online] [August 15, 2006]. http://www.epa.gov/region9/air/maps/maps_top.html. The U.S. EPA revoked the annual PM_{10} federal standard in December 2006 citing a lack of evidence linking health problems to long term exposure to coarse particle pollution.

3 South Coast Air Quality Management District, Final Localized Significance Threshold Methodology, June 2003.

is based on a derivation from PM_{10} using mass fraction profiles from CARB.[4] The thresholds for NO_2 and CO were based on the maximum concentrations that occurred during the last three years (2003 to 2005) as shown in Table 1. These thresholds represent the allowable increase in NO_2 and CO ambient concentrations above current levels that could occur in SRA 2 without causing or contributing to exceedances of the California Ambient Air Quality Standards (CAAQS). For reference, the applicable CAAQS are also shown in Table 2.

Table 2
Localized Significance Criteria

Pollutant	Averaging Period	CAAQS/NAAQS[1]		Peak Conc. in ppm	LST Criteria[2]	
		µg/m³	ppm		µg/m³	ppm
Respirable Particulate Matter (PM_{10})	24 hours	50	NA	NA	10.4	NA
Fine Particulate Matter ($PM_{2.5}$)	24 hours	35	NA	NA	10.4	NA
Nitrogen Dioxide (NO_2)	1 hour	470	0.25	0.12	244	0.13
Carbon Monoxide (CO)	1 hour	23,000	20	5	17,165	15
	8 hours	10,000	9.0	2.7	7,209	6.3

Source: South Coast Air Quality Management District, Final Localized Significance Threshold Methodology, June 2003 and Final Methodology to Calculate Particulate Matter (PM) 2.5 and PM2.5 Significance Thresholds, October 2006.

1 California has not adopted a 24-hour AAQS for $PM_{2.5}$; the 24-hour $PM_{2.5}$ AAQS shown is the national standard. All other standards are the California standards.

2 LST Criteria for NO_2 and CO are the difference between CAAQS and the Peak Concentration.

2.0 EMISSION ESTIMATION METHODOLOGY

URBEMIS2002 (version 8.7) was used to estimate the construction emissions for criteria pollutants as directed by SCAQMD's California Environmental Quality Act (CEQA) Air Quality Handbook. The following information provided by the applicant was used to set up the URBEMIS2002 model. Where information was not available, the model default values were used. The model inputs are as indicated below. Additional details are shown in the URBEMIS2002 output found in Appendices A through D.

2.1 Component 1: Neptune Marina Parcel 10R

- Anticipated demolition schedule: January 2010 to February 2010;
- Anticipated grading schedule (start and end month and year): March 2010 to May 2010;

4 South Coast Air Quality Management District, Final Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, October 2006).

- Total number of acres of land to be graded: 7.32 acres;
- Maximum acres graded per day: 1.83 acres;
- Amount of soil to be exported: 112,104 cubic yards (cy);
- Number of days to conduct soil hauling and grading: 66 days;
- Dust control measures: As required by SCAQMD Rule 403; and
- Anticipated construction schedule (including demolition and grading, start and end month and year): January 2010 to September 2012.

2.2 Component 2: Neptune Marina Parcel FF

- Anticipated demolition schedule: January 2011;
- Anticipated grading schedule (start and end month and year): January 2011 to April 2011;
- Total number of acres of land to be graded: 2.04 acres;
- Maximum acres graded per day: 1.02 acre;
- Amount of soil to be exported: 29,607 cy;
- Number of days to conduct soil hauling and grading: 66 days
- Dust control measures: As required by SCAQMD Rule 403; and
- Anticipated construction schedule (including demolition and grading, start and end month and year): January 2011 to September 2012.

2.3 Component 3: Woodfin Suite Hotel and Timeshare Resort (Parcel 9U North)

- Anticipated grading schedule (start and end month and year): January 2009;
- Total number of acres of land to be graded: 2.20 acres;
- Maximum acres graded per day: 0.55 acre;
- Amount of soil to be exported: 31,356 cy (33,680 cy cut and 2,324 cy fill);
- Number of days to conduct soil hauling and grading: 66 days
- Dust control measures: As required by SCAQMD Rule 403; and
- Anticipated construction schedule (including demolition and grading, start and end month and year): January 2009 to December 2010.

2.4 Component 4: Wetland Park (Parcel 9U South)

- Anticipated grading schedule (start and end month and year): January 2010;
- Total number of acres of land to be graded: 1.46 acres;
- Maximum acres graded per day: 0.37 acre;
- Amount of soil to be imported: 422 cy (1,468 cy cut and 1,890 cy fill);

- Number of days to conduct soil hauling and grading: 66 days
- Dust control measures: As required by SCAQMD Rule 403; and
- Anticipated construction schedule (including demolition and grading, start and end month and year): January 2010 to December 2010.

The LST analysis considered impacts from the individual components of the project as well as the combined impacts. The combined analysis is necessary because the construction phases for the individual components overlap. To determine the impacts from the individual components, the maximum daily emissions that could occur on each project site from any construction phase were selected for the LST analysis. The maximum daily emissions for each pollutant may occur during a different subphase (e.g., grading, building construction). Table 3, Estimated Construction Emissions Associated with the Proposed Project Components, shows the estimated construction emissions associated with each proposed project that would occur on the project site.

Table 3
Estimated Construction Emissions Associated with the Proposed Project Components

	Neptune Marina Parcel 10R (pounds per day)		Neptune Marina Parcel FF (pounds per day)		Woodfin Suite Hotel and Timeshare Resort (pounds per day)		Wetland Park (pounds per day)	
Pollutant	Fugitive Dust	Mobile Sources	Fugitive Dust	Mobile Sources	Fugitive Dust	Mobile Sources	Fugitive Dust	Mobile Sources
PM_{10}	36.99	2.22	7.08	2.50	7.53	1.25	0.00	1.59
$PM_{2.5}$	7.69	2.04	0.00	3.82	0.00	4.66	0.00	1.46
NO_X	—	147.06	—	113.95	—	144.31	—	48.30
CO	—	200.11	—	150.44	—	193.86	—	66.62

Source: Construction emissions were estimated using URBEMIS2002 (Version 8.7). Emissions reflect the worst-case scenario (i.e., highest daily emissions associated with a project component). The worst-case daily emissions may occur in different construction subphases.

To determine the impacts from the combined project for each pollutant, the maximum daily emissions that could occur from all four project components was analyzed. In addition, for pollutants with very short-term averaging periods, such as CO and NO_2, an additional case was analyzed to account for potential impacts near the Woodfin Suite Hotel and Timeshare Resort project that could occur due to the relatively high CO and NO_X emissions from this project component. This additional case is necessary because the maximum estimated CO and NO_X emissions from the Woodfin Suite Hotel and Timeshare Resort project does not coincide with the same day that the maximum combined project CO and NO_X emissions occur. Table 4, Estimated Construction Emissions Associated with the Proposed Combined

Project, shows the estimated daily construction emissions associated with each project component during the day with the greatest total emissions as well the as the emissions associated with the additional case for the pollutants with short-term averagingperiods.

Table 4
Estimated Construction Emissions Associated with the Proposed Combined Project

Pollutant	Project Component	Day of Maximum Emissions for the Combined Project (pounds per day)		Day of Maximum Emissions at Woodfin Suite Hotel and Timeshare Resort (pounds per day)	
		Fugitive Dust	Mobile Sources	Fugitive Dust	Mobile Sources
PM_{10}	Parcel 10R	36.99	2.22		
	Parcel FF	2.50	7.08		
	Hotel (9U)	7.53	1.25		
	Wetland (9U)	0.00	0.00		
$PM_{2.5}$	Parcel 10R	7.69	2.04		
	Parcel FF	2.30	1.47		
	Hotel (9U)	1.57	1.15		
	Wetland (9U)	0.00	0.00		
NO_X	Parcel 10R	—	123.87	—	123.87
	Parcel FF	—	113.95	—	0.00
	Hotel (9U)	—	121.12	—	144.13
	Wetland (9U)	—	25.11	—	25.11
CO	Parcel 10R	—	166.12	—	166.12
	Parcel FF	—	150.44	—	0.00
	Hotel (9U)	—	159.87	—	193.86
	Wetland (9U)	—	32.63	—	32.63

Source: Construction emissions were estimated using URBEMIS2002 (Version 8.7). Emissions reflect the worst-case scenario (i.e., highest daily emissions associated with the combined project and highest daily emissions associated with the Woodfin Suite Hotel and Timeshare Resort (Parcel 9U North). The worst-case daily emissions may occur in different construction subphases for each pollutant.

3.0 LOCALIZED SIGNIFICANCE THRESHOLD ANALYSIS

Per the recommendation of the SCAQMD, ambient PM_{10}, $PM_{2.5}$, NO_2, and CO concentrations due to the construction of proposed project were analyzed using methods described in the SCAQMD's LST Methodology.[5] The U.S. Environmental Protection Agency-approved dispersion model Industrial Source

[5] Ibid.

Complex – Short Term, ISCST3,[6] was used for the analysis to model the dispersion of the pollutants of concern.

3.1 Modeling Approach

The modeling for this analysis was conducted for each project component separately and for the combined project components. For the individual project components, modeling was conducted based on the estimated emissions presented in Table 3. For the combined project, modeling was conducted based on the estimated concurrent emissions presented in Table 4. The general modeling approach is as follows:

- Sources: The project site for the Neptune Marina Parcel 10R was divided into four roughly equal areas, and the project sites for the Neptune Marina Parcel FF, the Woodfin Suite Hotel and Timeshare Resort, and the Wetland Park were each divided into two areas. This approach was based on the assumption that grading or construction activity would occur on a portion of the overall project site on the day with the worst-case emissions, and that the grading or construction activity was equally likely to occur in any of these portions. Fugitive dust emissions were treated as area sources distributed over the project sites. Per the LST methodology, the area sources were given a ground level release height and a 1-meter initial vertical dimension to represent the initial vertical spread of the emissions. Dry depletion parameters, per the LST methodology, were used to evaluate the PM_{10} ambient impacts of the fugitive dust sources. Equipment and motor vehicle exhaust emissions of PM_{10}, $PM_{2.5}$, NO_2, and CO were modeled as volume sources with a release height of 5 meters (m), which represents the mid-range of the expected plume rise from frequently used construction equipment during daytime atmospheric conditions.[7] To simulate the exhaust emissions, 4 to 12 elevated volume sources with dimensions of 20 m by 20 m were distributed throughout the four portions of Neptune Marina Parcel 10R and throughout the two portions of Neptune Marina Parcel FF, the Woodfin Suite Hotel and Timeshare Resort, and the Wetland Park project sites. Figure 1, Modeled Areas for Each Project Component, and Figure 2, Modeled Areas for Combined Project, show the areas that were used to model the impacts of the construction emissions of each project component and of the combined project components, respectively.

- Receptors: Discrete fenceline receptors and discrete Cartesian receptors were used to determine air quality impacts in the vicinity of the project sites. The fenceline receptors were placed at 25-m intervals from the construction site boundaries out to 500 meters. Since the project area is relatively flat, flat terrain was assumed.

- Meteorology: West Los Angeles was identified as the nearest meteorological monitoring station for the proposed project. Deposition meteorological data were used for the fugitive dust sources. These data were obtained from the SCAQMD.

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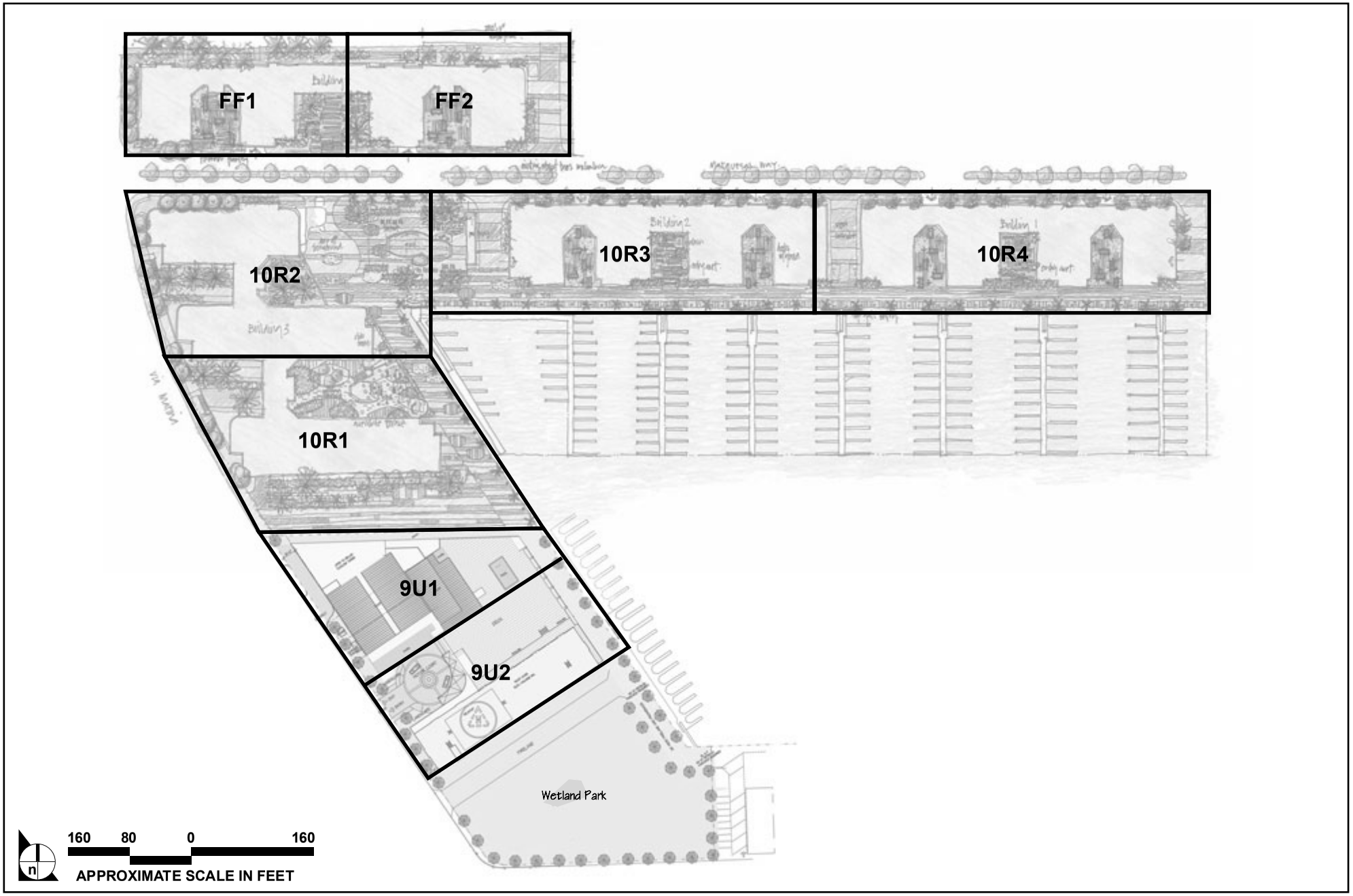
6 Lakes Environmental Software, ISC-AERMOD View (Version 5.6.0).

7 South Coast Air Quality Management District, Final Localized Significance Threshold Methodology, June 2003, p. 2-2.

- Model Options: SCAQMD model options were selected (NOCALM, URBAN). Dry deposition was selected for the PM_{10} sources except for the Wetland Park project site during the separate modeling run. This was done because the estimated maximum PM_{10} emissions from the Wetland Park originated from sources of diesel exhaust rather than fugitive dust. Because of limitations inherent in the modeling software, deposition parameters were implemented for all sources of PM_{10} during the combined modeling run, as per the LST methodology.

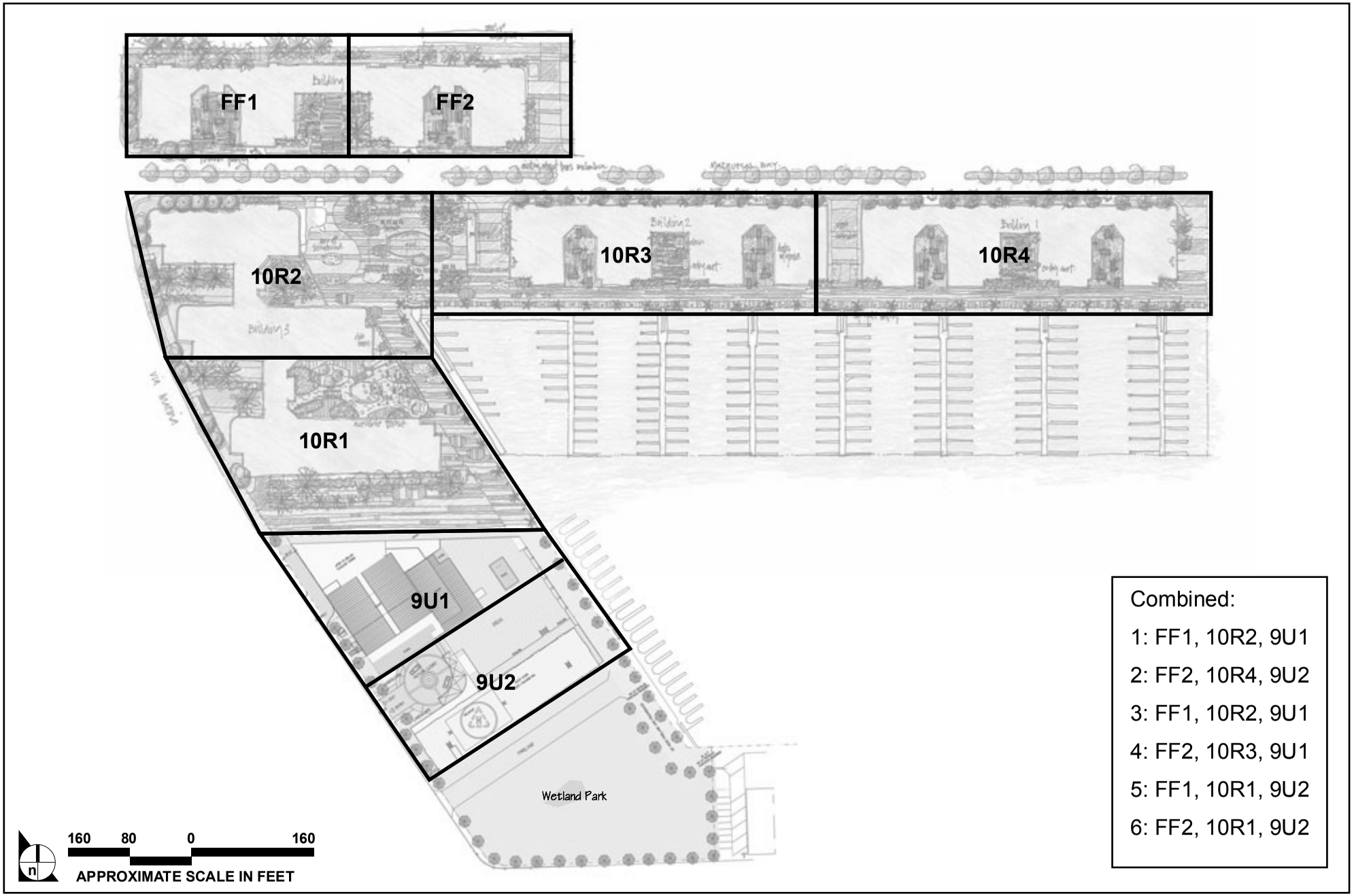


SOURCE: Impact Sciences, Inc. – November 2006

FIGURE **1**

Modeled Areas for Each Project Component

460-04•11/06



SOURCE: Impact Sciences, Inc. – November 2006

FIGURE **2**

Modeled Areas for Combined Project Components

460-04•11/06

3.2 Modeling Results

3.2.1 Adjustment of NO_2 Impacts

The SCAQMD's LST Methodology discusses an adjustment of the NO_2 impacts due to the fact that most of NO_X in the combustion exhaust will occur in the form of nitric oxide (NO), rather than as NO_2. Nitric oxide is converted in the atmosphere through chemical reactions to NO_2. The LST methodology discusses this adjustment as follows:

> NO_X emissions are simulated in the air quality dispersion model and the NO_2 conversion rate is treated by an NO_2-to-NO_X ratio, which is a function of downwind distance. Initially, it is assumed that only five percent of the emitted NO_X is NO_2. At 5,000 meters downwind, 100 percent conversion of NO-to-NO_2 is assumed.[8]

The following Table 5, NO_2-to-NO_X Ratio as a Function of Downwind Distance, from the LST Methodology demonstrates how the NO_2-to-NO_X ratio varies with distance from the source.

Table 5
NO_2-to-NO_X Ratio as a Function of Downwind Distance

Downwind Distance	NO_2/NO_X Ratio
20	0.053
50	0.059
70	0.064
100	0.074
200	0.114
500	0.258
1000	0.467
2000	0.75
3000	0.9
4000	0.978
5000	1.0

Source: Impact Sciences, Inc.
[1] South Coast Air Quality Management District, Final Localized Significance Threshold Methodology, June 2003, Table 2-4, p. 2-9.

For this analysis, the distance from the center of the modeling area (i.e., center of the volume sources constituting the areas in which construction activity is assumed to occur) to the receptor with the highest

8 South Coast Air Quality Management District, Final Localized Significance Threshold Methodology, June 2003, p. 2-8. The NO_2 conversion rates are adapted by the SCAQMD from Arellano, J.V., A.M. Talmon, and P.J.H. Builtjes, "A Chemically Reactive Plume Model for the NO-NO_2-O_3 System," Atmospheric Environment 24A, 2237-2246.

impact was determined. A NO_X-to-NO_2 ratio was determined from the values in Table 5. Ratios at distances between the values in Table 5 were interpolated. For the site at which the Neptune Marina Parcel 10R project would be located, the distance to the maximum impacted receptor was found to be 90 meters and a NO_X-to-NO_2 ratio of 0.071 was applied to the modeled results. For the site at which the Neptune Marina Parcel FF project would be located, the distance to the maximum impacted receptor was found to be 80 meters, and a NO_X-to-NO_2 ratio of 0.067 was applied to the modeled results. For the site at which the Woodfin Suite Hotel and Timeshare Resort would be located, the distance to the maximum impacted receptor was found to be 80 meters, and a NO_X-to-NO_2 ratio of 0.067 was applied to the modeled results. For the site at which the Wetland Park would be located, the distance to the maximum impacted receptor was found to be 50 meters, and a NO_X-to-NO_2 ratio of 0.059 was applied to the modeled results.

For the combined project, the conversion to NO_2 was determined by analyzing the NO_X contributions from the individual project components at the maximally impacted sensitive receptor during the hour when the maximum impact occurs. According to the modeling results, 91.8 percent of the NO_X concentration at the maximally impacted receptor during the specified hour was due to the emissions associated with the construction of the nearby Woodfin Suite Hotel and Timeshare Resort project. Therefore, a NO_X-to-NO_2 ratio using the distance from the relevant modeled area of the hotel project was applied to 91.8 percent of the total combined maximum NO_X concentration at the receptor. The remaining 8.2 percent of the total maximum NO_X concentration was due to emissions associated with the construction of Parcel 10R. Therefore, a NO_X-to-NO_2 ratio using the distance from the relevant modeled area of Parcel 10R was applied to 8.2 percent of the total combined NO_X concentration at the receptor. The modeling results indicate that the Wetland Park would contribute a negligible amount of NO_X at the maximally impacted receptor during the specified hour. Also, it should be noted that Parcel FF is scheduled to be completed at this particular time and therefore would not contribute any construction emissions to the combined NO_X total. Based on this analysis, a NO_X-to-NO_2 ratio of 0.064 was applied to 91.8 percent of the modeled results and a ratio of 0.186 was applied to 8.2 percent of the modeled results. Details of this analysis are presented in Appendix F.

3.2.2 Project-Specific Impacts

Table 6, Modeling Results – Neptune Marina Parcel 10R, Table 7, Modeling Results – Neptune Marina Parcel FF, Table 8, Modeling Results – Woodfin Suite Hotel and Timeshare Resort (Parcel 9U), and Table 9, Modeling Results – Wetland Park (Parcel 9U) show the maximum PM_{10}, $PM_{2.5}$, NO_2, and CO concentrations associated with each component of the proposed project at receptors within 500 meters of the combined project sites. As stated in Section 3.1, each project site was divided into two or four areas. The values shown in these tables are the maximum results associated with the area producing the highest impacts because the activity could occur in any of the areas on any given day. Table 10, Modeling Results – Combined Project Components, shows the maximum PM_{10}, $PM_{2.5}$, NO_2, and CO concentrations

associated with concurrent construction activities in each component of the proposed project at receptors within 500 meters of the combined project sites. For determining maximum cumulative impacts from NO_X and CO emissions, different combinations of areas within each of the four project components were analyzed because it is not known where concurrent activities would occur during construction of each component. Based on the construction schedule provided by the applicant, maximum emissions were estimated for concurrent construction phases from the project components. Various scenarios that resulted in the relatively high concurrent emissions were used to estimate the range of potential impacts from concurrent construction activities. The maximum combined impacts from these various combinations shown in Table 10. With respect to maximum combined impacts from PM_{10} and $PM_{2.5}$ emissions, it was determined that the maximum PM_{10} and $PM_{2.5}$ emissions occur in year 2009, when construction is scheduled to occur in Parcel 10R, Parcel FF, and the Woodfin Suite Hotel and Timeshare Resort. The concurrent PM_{10} and $PM_{2.5}$ emissions during this time period are substantially higher than at any other time during construction of the combined proposed project. Therefore, Table 10 presents conservative PM_{10} and $PM_{2.5}$ impacts to sensitive receptors.

Table 6
Modeling Results
Neptune Marina Parcel 10R

Pollutant	Averaging Period	Modeling Results µg/m3	Modeling Results ppm	LST Criteria µg/m3	LST Criteria ppm	Exceeds Threshold?
Respirable Particulate Matter (PM_{10})	24 hours	41.7	NA	10.4	NA	YES
Fine Particulate Matter ($PM_{2.5}$)	24 hours	12.9	NA	10.4	NA	YES
Nitrogen Dioxide (NO_2)	1 hour	211.1	0.11	244	0.13	NO
Carbon Monoxide (CO)	1 hour	4,070	3.6	17,165	15	NO
	8 hours	1,420	1.2	7,209	6.3	NO

Source: Impact Sciences, Inc.

Table 7
Modeling Results
Neptune Marina Parcel FF

Pollutant	Averaging Period	Modeling Results µg/m3	Modeling Results ppm	LST Criteria µg/m3	LST Criteria ppm	Exceeds Threshold?
Respirable Particulate Matter (PM_{10})	24 hours	24.5	NA	10.4	NA	YES
Fine Particulate Matter ($PM_{2.5}$)	24 hours	13.5	NA	10.4	NA	YES
Nitrogen Dioxide (NO_2)	1 hour	225.0	0.12	244	0.13	NO
Carbon Monoxide (CO)	1 hour	4,425	3.9	17,165	15	NO
	8 hours	1,599	1.4	7,209	6.3	NO

Source: Impact Sciences, Inc.

Table 8
Modeling Results
Woodfin Suite Hotel and Timeshare Resort (Parcel 9U North)

Pollutant	Averaging Period	Modeling Results µg/m3	Modeling Results ppm	LST Criteria µg/m3	LST Criteria ppm	Exceeds Threshold?
Respirable Particulate Matter (PM_{10})	24 hours	19.6	NA	10.4	NA	YES
Fine Particulate Matter ($PM_{2.5}$)	24 hours	12.9	NA	10.4	NA	YES
Nitrogen Dioxide (NO_2)	1 hour	308.7	0.16	244	0.13	YES
Carbon Monoxide (CO)	1 hour	6,157	5.4	17,165	15	NO
	8 hours	1,611	1.4	7,209	6.3	NO

Source: Impact Sciences, Inc.

Table 9
Modeling Results
Wetland Park (Parcel 9U South)

Pollutant	Averaging Period	Modeling Results µg/m3	Modeling Results ppm	LST Criteria µg/m3	LST Criteria ppm	Exceeds Threshold?
Respirable Particulate Matter (PM_{10})	24 hours	7.7	NA	10.4	NA	NO
Fine Particulate Matter ($PM_{2.5}$)	24 hours	7.0	NA	10.4	NA	NO
Nitrogen Dioxide (NO_2)	1 hour	115.0	0.06	244	0.13	NO
Carbon Monoxide (CO)	1 hour	2,688	2.4	17,165	15	NO
	8 hours	962	0.8	7,209	6.3	NO

Source: Impact Sciences, Inc.

Table 10
Modeling Results
Combined Project Components

Pollutant	Averaging Period	Modeling Results µg/m3	Modeling Results ppm	LST Criteria µg/m3	LST Criteria ppm	Exceeds Threshold?
Respirable Particulate Matter (PM_{10})	24 hours	75.8	NA	10.4	NA	YES
Fine Particulate Matter ($PM_{2.5}$)	24 hours	26.4	NA	10.4	NA	YES
Nitrogen Dioxide (NO_2)	1 hour	351.2	0.19	244	0.13	YES
Carbon Monoxide (CO)	1 hour	6,373	5.6	17,165	15	NO
	8 hours	3,398	3.0	7,209	6.3	NO

Source: Impact Sciences, Inc.

4.0 CONCLUSIONS

The LST analysis was conducted to estimate worst-case ambient air quality impacts during construction of the four individual project components and the impacts from the combined construction of all four project components. The analysis indicates that the 24-hour PM_{10} and $PM_{2.5}$ thresholds would be exceeded during the individual construction of Parcel 10R, Parcel FF, and the Woodfin Suite Hotel and Timeshare Resort. In addition, the 1-hour NO_2 threshold would be exceeded during the construction of the Woodfin Suite Hotel and Timeshare Resort. Individual construction of the Wetland Park is not expected to exceed any of the established thresholds. The 24-hour PM_{10} and $PM_{2.5}$ thresholds and the 1-hour NO_2 threshold would be exceeded as a result of the construction of the combined project components as well. The impacts suggest that PM_{10} emissions could exceed the limitations in SCAQMD Rule 403. While the NO_2 concentrations for Component 3 and the combined project components exceed the LST thresholds, the CAAQS would be exceeded only if (1) the actual background concentrations were as high as those on which the LST thresholds are based during the worst-case construction day, (2) the amount of construction activity (e.g., number and types of equipment, hours of operation) assumed in this analysis actually occurred, and (3) the meteorological conditions in the data set used in the dispersion modeling analysis occurred in the vicinity of the project site on the worst-case construction day.

LST Appendix A - URBEMIS Output for Parcel 10R

URBEMIS 2002 For Windows 8.7.0

File Name: M:\Camarillo\9. Air Quality\URBEMIS Files\Neptune Marina\Parcel 10R\Parcel 10R.urb
Project Name: Parcel 10R
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

*** 2007 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	9.95	93.47	71.85	0.06	40.36	3.23	37.13
TOTALS (lbs/day, mitigated)	9.95	93.47	71.85	0.06	40.36	3.23	37.13

*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	22.67	242.42	171.20	0.23	26.44	7.61	18.83
TOTALS (lbs/day, mitigated)	20.86	133.34	171.20	0.00	5.17	4.99	0.18

*** 2009 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	20.78	128.69	173.58	0.00	4.90	4.72	0.18
TOTALS (lbs/day, mitigated)	20.78	128.69	173.58	0.00	4.90	4.72	0.18

*** 2010 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	144.02	124.57	184.54	0.01	4.74	4.38	0.36
TOTALS (lbs/day, mitigated)	144.02	124.57	184.54	0.01	4.74	4.38	0.36

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	21.17	5.27	4.42	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	20.57	16.35	178.41	0.13	20.43

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	41.74	21.62	182.83	0.13	20.44

URBEMIS 2002 For Windows 8.7.0

File Name: M:\Camarillo\9. Air Quality\URBEMIS Files\Neptune Marina\Parcel 10R\Parcel 10R.urb
Project Name: Parcel 10R
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

CONSTRUCTION EMISSION ESTIMATES

*** 2007 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	9.95	93.47	71.85	0.06	40.36	3.23	37.13
TOTALS (lbs/day, mitigated)	9.95	93.47	71.85	0.06	40.36	3.23	37.13

*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	22.67	242.42	171.20	0.23	26.44	7.61	18.83
TOTALS (lbs/day, mitigated)	20.86	133.34	171.20	0.00	5.17	4.99	0.18

*** 2009 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	20.78	128.69	173.58	0.00	4.90	4.72	0.18
TOTALS (lbs/day, mitigated)	20.78	128.69	173.58	0.00	4.90	4.72	0.18

*** 2010 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	144.02	124.57	184.54	0.01	4.74	4.38	0.36
TOTALS (lbs/day, mitigated)	144.02	124.57	184.54	0.01	4.74	4.38	0.36

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	20.99	5.25	3.16	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	14.32	23.63	169.85	0.11	20.43

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	35.30	28.88	173.01	0.11	20.44

URBEMIS 2002 For Windows 8.7.0

File Name: M:\Camarillo\9. Air Quality\URBEMIS Files\Neptune Marina\Parcel 10R\Parcel 10R.urb
Project Name: Parcel 10R
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Winter)

Construction Start Month and Year: October, 2007
Construction Duration: 36
Total Land Use Area to be Developed: 7.32 acres
Maximum Acreage Disturbed Per Day: 1.83 acres
Single Family Units: 0 Multi-Family Units: 400
Retail/Office/Institutional/Industrial Square Footage: 87000

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	36.99	-	36.99
Off-Road Diesel	8.37	61.20	63.67	-	2.61	2.61	0.00
On-Road Diesel	1.45	32.02	5.40	0.06	0.74	0.61	0.13
Worker Trips	0.13	0.25	2.78	0.00	0.02	0.01	0.01
Maximum lbs/day	9.95	93.47	71.85	0.06	40.36	3.23	37.13
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00

Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max lbs/day all phases	9.95	93.47	71.85	0.06	40.36	3.23	37.13

*** 2008***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	18.30	-	18.30
Off-Road Diesel	17.23	125.07	132.13	-	5.34	5.34	0.00
On-Road Diesel	5.39	117.32	20.08	0.23	2.79	2.27	0.52
Worker Trips	0.05	0.03	0.67	0.00	0.01	0.00	0.01
Maximum lbs/day	22.67	242.42	152.88	0.23	26.44	7.61	18.83
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.93	132.80	159.70	-	4.98	4.98	0.00
Bldg Const Worker Trips	0.94	0.54	11.50	0.00	0.19	0.01	0.18
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	20.86	133.34	171.20	0.00	5.17	4.99	0.18
Max lbs/day all phases	22.67	242.42	171.20	0.23	26.44	7.61	18.83

*** 2009***

Phase 1 - Demolition Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 3 - Building Construction

Bldg Const Off-Road Diesel	19.93	128.19	162.97	-	4.71	4.71	0.00
Bldg Const Worker Trips	0.85	0.50	10.61	0.00	0.19	0.01	0.18
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	20.78	128.69	173.58	0.00	4.90	4.72	0.18
Max lbs/day all phases	20.78	128.69	173.58	0.00	4.90	4.72	0.18

*** 2010***

Phase 1 - Demolition Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.93	123.87	166.12	-	4.36	4.36	0.00
Bldg Const Worker Trips	0.77	0.46	9.76	0.00	0.19	0.01	0.18
Arch Coatings Off-Gas	122.67	-	-	-	-	-	-
Arch Coatings Worker Trips	0.71	0.35	9.21	0.00	0.19	0.01	0.18
Asphalt Off-Gas	1.43	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.23	3.40	0.86	0.01	0.11	0.10	0.01
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	144.02	124.57	184.54	0.01	4.74	4.38	0.36
Max lbs/day all phases	144.02	124.57	184.54	0.01	4.74	4.38	0.36

Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Oct '07
Phase 1 Duration: 3 months
Building Volume Total (cubic feet): 1938010.62
Building Volume Daily (cubic feet): 88082.3535
On-Road Truck Travel (VMT): 1223.25
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Tractors	255	0.410	8.0
2	Rough Terrain Forklifts	94	0.475	8.0
1	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '08
Phase 2 Duration: 1.2 months
On-Road Truck Travel (VMT): 4924
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
4	Rubber Tired Dozers	352	0.590	8.0

4	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Feb '08
Phase 3 Duration: 31.8 months
Start Month/Year for SubPhase Building: Feb '08
SubPhase Building Duration: 30.3 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Bore/Drill Rigs	218	0.750	8.0
1	Cranes	190	0.430	8.0
5	Other Equipment	190	0.620	8.0
5	Rough Terrain Forklifts	94	0.475	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Start Month/Year for SubPhase Architectural Coatings: Jul '10
SubPhase Architectural Coatings Duration: 1 months
Start Month/Year for SubPhase Asphalt: Sep '10
SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 6
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	36.99	-	36.99
Off-Road Diesel	8.37	61.20	63.67	-	2.61	2.61	0.00
On-Road Diesel	1.45	32.02	5.40	0.06	0.74	0.61	0.13
Worker Trips	0.13	0.25	2.78	0.00	0.02	0.01	0.01
Maximum lbs/day	9.95	93.47	71.85	0.06	40.36	3.23	37.13
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							

Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max lbs/day all phases	9.95	93.47	71.85	0.06	40.36	3.23	37.13

*** 2008***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	5.86	-	5.86
Off-Road Diesel	17.23	125.07	132.13	-	5.34	5.34	0.00
On-Road Diesel	5.39	117.32	20.08	0.23	2.79	2.27	0.52
Worker Trips	0.05	0.03	0.67	0.00	0.01	0.00	0.01
Maximum lbs/day	22.67	242.42	152.88	0.23	14.00	7.61	6.39
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.93	132.80	159.70	-	4.98	4.98	0.00
Bldg Const Worker Trips	0.94	0.54	11.50	0.00	0.19	0.01	0.18
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	20.86	133.34	171.20	0.00	5.17	4.99	0.18
Max lbs/day all phases	20.86	133.34	171.20	0.00	5.17	4.99	0.18

*** 2009***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.93	128.19	162.97	-	4.71	4.71	0.00
Bldg Const Worker Trips	0.85	0.50	10.61	0.00	0.19	0.01	0.18
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	20.78	128.69	173.58	0.00	4.90	4.72	0.18
Max lbs/day all phases	20.78	128.69	173.58	0.00	4.90	4.72	0.18

*** 2010***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.93	123.87	166.12	-	4.36	4.36	0.00
Bldg Const Worker Trips	0.77	0.46	9.76	0.00	0.19	0.01	0.18
Arch Coatings Off-Gas	122.67	-	-	-	-	-	-
Arch Coatings Worker Trips	0.71	0.35	9.21	0.00	0.19	0.01	0.18
Asphalt Off-Gas	1.43	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.23	3.40	0.86	0.01	0.11	0.10	0.01
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	144.02	124.57	184.54	0.01	4.74	4.38	0.36
Max lbs/day all phases	144.02	124.57	184.54	0.01	4.74	4.38	0.36

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Rule 403 - Water 3X Daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 68.0%)
Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Oct '07
Phase 1 Duration: 3 months
Building Volume Total (cubic feet): 1938010.62
Building Volume Daily (cubic feet): 88082.3535
On-Road Truck Travel (VMT): 1223.25
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Tractors	255	0.410	8.0

2	Rough Terrain Forklifts	94	0.475	8.0
1	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '08
Phase 2 Duration: 1.2 months
On-Road Truck Travel (VMT): 4924
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
4	Rubber Tired Dozers	352	0.590	8.0
4	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Feb '08
Phase 3 Duration: 31.8 months
Start Month/Year for SubPhase Building: Feb '08
SubPhase Building Duration: 30.3 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Bore/Drill Rigs	218	0.750	8.0
1	Cranes	190	0.430	8.0
5	Other Equipment	190	0.620	8.0
5	Rough Terrain Forklifts	94	0.475	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Start Month/Year for SubPhase Architectural Coatings: Jul '10
SubPhase Architectural Coatings Duration: 1 months
Start Month/Year for SubPhase Asphalt: Sep '10
SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 6
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.40	5.25	3.16	0	0.01
Hearth	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	19.57	-	-	-	-
Architectural Coatings	1.02	-	-	-	-
TOTALS(lbs/day,unmitigated)	20.99	5.25	3.16	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Apartments low rise	11.30	18.52	133.90	0.09	16.07
Boat Slips	3.01	5.11	35.96	0.02	4.36
TOTAL EMISSIONS (lbs/day)	14.32	23.63	169.85	0.11	20.43

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Apartments low rise	0.00	3.96 trips/dwelling unit	400.00	1,584.00
Boat Slips		2.88 trips/rooms	174.00	501.64
		Sum of Total Trips		2,085.64
		Total Vehicle Miles Traveled		13,477.18

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90

Line Haul > 60,000	lbs	0.00	0.00	0.00	100.00
Urban Bus		0.20	0.00	50.00	50.00
Motorcycle		1.60	68.80	31.20	0.00
School Bus		0.10	0.00	0.00	100.00
Motor Home		1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

Boat Slips	5.0	2.5	92.5

Changes made to the default values for Land Use Trip Percentages

The Trip Rate and/or Acreage values for Apartments low rise
 have changed from the defaults 6.9/25. to 3.96/

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths
Demolition Truck Hauling Miles/Round Trip changed from 30 to 7.5
Architectural Coatings: # ROG/ft2 (residential) changed from 0.0185 to 0.00272
Architectural Coatings: # ROG/ft2 (non-res) changed from 0.0185 to 0.00116
Phase 2 mitigation measure Soil Disturbance: Rule 403 - Water 3X Daily
     has been changed from off to on.

Changes made to the default values for Area

The hearth option switch changed from on to off.
The landscape year changed from 2005 to 2010.
The residential Arch. Coatings ROG emission factor changed from 0.0185 to 0.00272.
The nonresidential Arch. Coatings ROG emission factor changed from 0.0185 to 0.00116.

Changes made to the default values for Operations

The operational emission year changed from 2005 to 2010.

URBEMIS 2002 For Windows 8.7.0

File Name: M:\Camarillo\9. Air Quality\URBEMIS Files\Neptune Marina\Parcel 10R\Parcel 10R.urb
Project Name: Parcel 10R
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

Construction Start Month and Year: October, 2007
Construction Duration: 36
Total Land Use Area to be Developed: 7.32 acres
Maximum Acreage Disturbed Per Day: 1.83 acres
Single Family Units: 0 Multi-Family Units: 400
Retail/Office/Institutional/Industrial Square Footage: 87000

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	36.99	-	36.99
Off-Road Diesel	8.37	61.20	63.67	-	2.61	2.61	0.00
On-Road Diesel	1.45	32.02	5.40	0.06	0.74	0.61	0.13
Worker Trips	0.13	0.25	2.78	0.00	0.02	0.01	0.01
Maximum lbs/day	9.95	93.47	71.85	0.06	40.36	3.23	37.13
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00

Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max lbs/day all phases	9.95	93.47	71.85	0.06	40.36	3.23	37.13

*** 2008***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	18.30	-	18.30
Off-Road Diesel	17.23	125.07	132.13	-	5.34	5.34	0.00
On-Road Diesel	5.39	117.32	20.08	0.23	2.79	2.27	0.52
Worker Trips	0.05	0.03	0.67	0.00	0.01	0.00	0.01
Maximum lbs/day	22.67	242.42	152.88	0.23	26.44	7.61	18.83
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.93	132.80	159.70	-	4.98	4.98	0.00
Bldg Const Worker Trips	0.94	0.54	11.50	0.00	0.19	0.01	0.18
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	20.86	133.34	171.20	0.00	5.17	4.99	0.18
Max lbs/day all phases	22.67	242.42	171.20	0.23	26.44	7.61	18.83

*** 2009***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.93	128.19	162.97	-	4.71	4.71	0.00
Bldg Const Worker Trips	0.85	0.50	10.61	0.00	0.19	0.01	0.18
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	20.78	128.69	173.58	0.00	4.90	4.72	0.18
Max lbs/day all phases	20.78	128.69	173.58	0.00	4.90	4.72	0.18

*** 2010***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.93	123.87	166.12	-	4.36	4.36	0.00
Bldg Const Worker Trips	0.77	0.46	9.76	0.00	0.19	0.01	0.18
Arch Coatings Off-Gas	122.67	-	-	-	-	-	-
Arch Coatings Worker Trips	0.71	0.35	9.21	0.00	0.19	0.01	0.18
Asphalt Off-Gas	1.43	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.23	3.40	0.86	0.01	0.11	0.10	0.01
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	144.02	124.57	184.54	0.01	4.74	4.38	0.36
Max lbs/day all phases	144.02	124.57	184.54	0.01	4.74	4.38	0.36

Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Oct '07
Phase 1 Duration: 3 months
Building Volume Total (cubic feet): 1938010.62
Building Volume Daily (cubic feet): 88082.3535
On-Road Truck Travel (VMT): 1223.25
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Tractors	255	0.410	8.0
2	Rough Terrain Forklifts	94	0.475	8.0
1	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '08
Phase 2 Duration: 1.2 months
On-Road Truck Travel (VMT): 4924
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
4	Rubber Tired Dozers	352	0.590	8.0

4	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Feb '08
Phase 3 Duration: 31.8 months
Start Month/Year for SubPhase Building: Feb '08
SubPhase Building Duration: 30.3 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Bore/Drill Rigs	218	0.750	8.0
1	Cranes	190	0.430	8.0
5	Other Equipment	190	0.620	8.0
5	Rough Terrain Forklifts	94	0.475	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Start Month/Year for SubPhase Architectural Coatings: Jul '10
SubPhase Architectural Coatings Duration: 1 months
Start Month/Year for SubPhase Asphalt: Sep '10
SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 6
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	36.99	-	36.99
Off-Road Diesel	8.37	61.20	63.67	-	2.61	2.61	0.00
On-Road Diesel	1.45	32.02	5.40	0.06	0.74	0.61	0.13
Worker Trips	0.13	0.25	2.78	0.00	0.02	0.01	0.01
Maximum lbs/day	9.95	93.47	71.85	0.06	40.36	3.23	37.13
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							

Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max lbs/day all phases	9.95	93.47	71.85	0.06	40.36	3.23	37.13

*** 2008***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	5.86	-	5.86
Off-Road Diesel	17.23	125.07	132.13	-	5.34	5.34	0.00
On-Road Diesel	5.39	117.32	20.08	0.23	2.79	2.27	0.52
Worker Trips	0.05	0.03	0.67	0.00	0.01	0.00	0.01
Maximum lbs/day	22.67	242.42	152.88	0.23	14.00	7.61	6.39
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.93	132.80	159.70	-	4.98	4.98	0.00
Bldg Const Worker Trips	0.94	0.54	11.50	0.00	0.19	0.01	0.18
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	20.86	133.34	171.20	0.00	5.17	4.99	0.18
Max lbs/day all phases	20.86	133.34	171.20	0.00	5.17	4.99	0.18

*** 2009***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.93	128.19	162.97	-	4.71	4.71	0.00
Bldg Const Worker Trips	0.85	0.50	10.61	0.00	0.19	0.01	0.18
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	20.78	128.69	173.58	0.00	4.90	4.72	0.18
Max lbs/day all phases	20.78	128.69	173.58	0.00	4.90	4.72	0.18

*** 2010***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.93	123.87	166.12	-	4.36	4.36	0.00
Bldg Const Worker Trips	0.77	0.46	9.76	0.00	0.19	0.01	0.18
Arch Coatings Off-Gas	122.67	-	-	-	-	-	-
Arch Coatings Worker Trips	0.71	0.35	9.21	0.00	0.19	0.01	0.18
Asphalt Off-Gas	1.43	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.23	3.40	0.86	0.01	0.11	0.10	0.01
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	144.02	124.57	184.54	0.01	4.74	4.38	0.36
Max lbs/day all phases	144.02	124.57	184.54	0.01	4.74	4.38	0.36

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Rule 403 - Water 3X Daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 68.0%)
Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Oct '07
Phase 1 Duration: 3 months
Building Volume Total (cubic feet): 1938010.62
Building Volume Daily (cubic feet): 88082.3535
On-Road Truck Travel (VMT): 1223.25
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Tractors	255	0.410	8.0

2	Rough Terrain Forklifts	94	0.475	8.0
1	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '08
Phase 2 Duration: 1.2 months
On-Road Truck Travel (VMT): 4924
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
4	Rubber Tired Dozers	352	0.590	8.0
4	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Feb '08
Phase 3 Duration: 31.8 months
Start Month/Year for SubPhase Building: Feb '08
SubPhase Building Duration: 30.3 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Bore/Drill Rigs	218	0.750	8.0
1	Cranes	190	0.430	8.0
5	Other Equipment	190	0.620	8.0
5	Rough Terrain Forklifts	94	0.475	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Start Month/Year for SubPhase Architectural Coatings: Jul '10
SubPhase Architectural Coatings Duration: 1 months
Start Month/Year for SubPhase Asphalt: Sep '10
SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 6
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.40	5.25	3.16	0	0.01
Hearth - No summer emissions					
Landscaping	0.18	0.02	1.26	0.00	0.00
Consumer Prdcts	19.57	-	-	-	-
Architectural Coatings	1.02	-	-	-	-
TOTALS(lbs/day,unmitigated)	21.17	5.27	4.42	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Apartments low rise	15.53	12.81	141.41	0.11	16.07
Boat Slips	5.05	3.54	37.00	0.03	4.36
TOTAL EMISSIONS (lbs/day)	20.57	16.35	178.41	0.13	20.43

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 90 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Apartments low rise	0.00	3.96 trips/dwelling unit	400.00	1,584.00
Boat Slips		2.88 trips/rooms	174.00	501.64
		Sum of Total Trips		2,085.64
		Total Vehicle Miles Traveled		13,477.18

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90

Line Haul > 60,000	lbs	0.00	0.00	0.00	100.00
Urban Bus		0.20	0.00	50.00	50.00
Motorcycle		1.60	68.80	31.20	0.00
School Bus		0.10	0.00	0.00	100.00
Motor Home		1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

% of Trips - Commercial (by land use)

Boat Slips	5.0	2.5	92.5

Changes made to the default values for Land Use Trip Percentages

The Trip Rate and/or Acreage values for Apartments low rise
 have changed from the defaults 6.9/25. to 3.96/

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths
Demolition Truck Hauling Miles/Round Trip changed from 30 to 7.5
Architectural Coatings: # ROG/ft2 (residential) changed from 0.0185 to 0.00272
Architectural Coatings: # ROG/ft2 (non-res) changed from 0.0185 to 0.00116
Phase 2 mitigation measure Soil Disturbance: Rule 403 - Water 3X Daily
     has been changed from off to on.

Changes made to the default values for Area

The hearth option switch changed from on to off.
The landscape year changed from 2005 to 2010.
The residential Arch. Coatings ROG emission factor changed from 0.0185 to 0.00272.
The nonresidential Arch. Coatings ROG emission factor changed from 0.0185 to 0.00116.

Changes made to the default values for Operations

The operational emission year changed from 2005 to 2010.

LST Appendix B - URBEMIS Output for Parcel FF

URBEMIS 2002 For Windows 8.7.0

File Name: M:\Camarillo\9. Air Quality\URBEMIS Files\Neptune Marina\Parcel FF\Parcel FF.urb
Project Name: Parcel FF
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

*** 2009 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	14.34	95.53	115.87	0.07	14.27	3.89	10.38
TOTALS (lbs/day, mitigated)	14.34	95.53	115.87	0.07	7.33	3.89	3.44

*** 2010 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	50.24	114.96	153.32	0.00	4.29	4.19	0.10
TOTALS (lbs/day, mitigated)	50.24	114.96	153.32	0.00	4.29	4.19	0.10

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	6.63	0.96	1.04	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	4.89	4.03	44.54	0.03	5.06

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	11.52	4.99	45.58	0.03	5.06

URBEMIS 2002 For Windows 8.7.0

File Name: M:\Camarillo\9. Air Quality\URBEMIS Files\Neptune Marina\Parcel FF\Parcel FF.urb
Project Name: Parcel FF
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

CONSTRUCTION EMISSION ESTIMATES

*** 2009 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	14.34	95.53	115.87	0.07	14.27	3.89	10.38
TOTALS (lbs/day, mitigated)	14.34	95.53	115.87	0.07	7.33	3.89	3.44

*** 2010 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	50.24	114.96	153.32	0.00	4.29	4.19	0.10
TOTALS (lbs/day, mitigated)	50.24	114.96	153.32	0.00	4.29	4.19	0.10

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	6.54	0.95	0.40	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	3.56	5.83	42.18	0.03	5.06

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	10.10	6.78	42.58	0.03	5.06

URBEMIS 2002 For Windows 8.7.0

File Name: M:\Camarillo\9. Air Quality\URBEMIS Files\Neptune Marina\Parcel FF\Parcel FF.urb
Project Name: Parcel FF
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Winter)

Construction Start Month and Year: February, 2009
Construction Duration: 17.5
Total Land Use Area to be Developed: 2.04 acres
Maximum Acreage Disturbed Per Day: 1.02 acres
Single Family Units: 0 Multi-Family Units: 126
Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2009***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.85	-	0.85
Off-Road Diesel	3.78	23.12	31.57	-	0.75	0.75	0.00
On-Road Diesel	0.03	0.61	0.11	0.00	0.01	0.01	0.00
Worker Trips	0.04	0.09	0.93	0.00	0.00	0.00	0.00
Maximum lbs/day	3.85	23.82	32.61	0.00	1.61	0.76	0.85
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	10.20	-	10.20
Off-Road Diesel	8.61	59.26	68.48	-	2.50	2.50	0.00
On-Road Diesel	1.60	34.43	5.99	0.07	0.84	0.67	0.17
Worker Trips	0.04	0.11	1.16	0.00	0.01	0.00	0.01
Maximum lbs/day	10.25	93.80	75.63	0.07	13.55	3.17	10.38
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	14.11	95.40	113.07	-	3.89	3.89	0.00
Bldg Const Worker Trips	0.22	0.13	2.80	0.00	0.05	0.00	0.05
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00

Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	14.34	95.53	115.87	0.00	3.94	3.89	0.05
Max lbs/day all phases	14.34	95.53	115.87	0.07	14.27	3.89	10.38

*** 2010***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	14.11	90.76	116.45	-	3.51	3.51	0.00
Bldg Const Worker Trips	0.20	0.12	2.58	0.00	0.05	0.00	0.05
Arch Coatings Off-Gas	35.75	-	-	-	-	-	-
Arch Coatings Worker Trips	0.19	0.09	2.43	0.00	0.05	0.00	0.05
Asphalt Off-Gas	0.38	-	-	-	-	-	-
Asphalt Off-Road Diesel	4.00	23.19	33.99	-	0.64	0.64	0.00
Asphalt On-Road Diesel	0.06	0.91	0.23	0.00	0.03	0.03	0.00
Asphalt Worker Trips	0.02	0.01	0.21	0.00	0.00	0.00	0.00
Maximum lbs/day	50.24	114.96	153.32	0.00	4.29	4.19	0.10
Max lbs/day all phases	50.24	114.96	153.32	0.00	4.29	4.19	0.10

Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Feb '09
Phase 1 Duration: 0.5 months
Building Volume Total (cubic feet): 44649.68445
Building Volume Daily (cubic feet): 2029.48205
On-Road Truck Travel (VMT): 28.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Concrete/Industrial saws	84	0.730	8.0
2	Rubber Tired Loaders	165	0.465	8.0

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Feb '09
Phase 2 Duration: 1 months
On-Road Truck Travel (VMT): 1590
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Mar '09
Phase 3 Duration: 16 months
Start Month/Year for SubPhase Building: Mar '09
SubPhase Building Duration: 14.5 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Concrete/Industrial saws	84	0.730	8.0
5	Other Equipment	190	0.620	8.0
2	Rough Terrain Forklifts	94	0.475	8.0

Start Month/Year for SubPhase Architectural Coatings: Apr '10
SubPhase Architectural Coatings Duration: 1 months
Start Month/Year for SubPhase Asphalt: May '10
SubPhase Asphalt Duration: .5 months
Acres to be Paved: 1.6
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Pavers	132	0.590	8.0
1	Rollers	114	0.430	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2009***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.85	-	0.85
Off-Road Diesel	3.78	23.12	31.57	-	0.75	0.75	0.00
On-Road Diesel	0.03	0.61	0.11	0.00	0.01	0.01	0.00
Worker Trips	0.04	0.09	0.93	0.00	0.00	0.00	0.00
Maximum lbs/day	3.85	23.82	32.61	0.00	1.61	0.76	0.85
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	3.26	-	3.26
Off-Road Diesel	8.61	59.26	68.48	-	2.50	2.50	0.00
On-Road Diesel	1.60	34.43	5.99	0.07	0.84	0.67	0.17
Worker Trips	0.04	0.11	1.16	0.00	0.01	0.00	0.01
Maximum lbs/day	10.25	93.80	75.63	0.07	6.61	3.17	3.44
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	14.11	95.40	113.07	-	3.89	3.89	0.00
Bldg Const Worker Trips	0.22	0.13	2.80	0.00	0.05	0.00	0.05
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	14.34	95.53	115.87	0.00	3.94	3.89	0.05
Max lbs/day all phases	14.34	95.53	115.87	0.07	7.33	3.89	3.44
*** 2010***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00

On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	14.11	90.76	116.45	-	3.51	3.51	0.00
Bldg Const Worker Trips	0.20	0.12	2.58	0.00	0.05	0.00	0.05
Arch Coatings Off-Gas	35.75	-	-	-	-	-	-
Arch Coatings Worker Trips	0.19	0.09	2.43	0.00	0.05	0.00	0.05
Asphalt Off-Gas	0.38	-	-	-	-	-	-
Asphalt Off-Road Diesel	4.00	23.19	33.99	-	0.64	0.64	0.00
Asphalt On-Road Diesel	0.06	0.91	0.23	0.00	0.03	0.03	0.00
Asphalt Worker Trips	0.02	0.01	0.21	0.00	0.00	0.00	0.00
Maximum lbs/day	50.24	114.96	153.32	0.00	4.29	4.19	0.10
Max lbs/day all phases	50.24	114.96	153.32	0.00	4.29	4.19	0.10

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Rule 403 - Water 3X Daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 68.0%)
Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Feb '09
Phase 1 Duration: 0.5 months
Building Volume Total (cubic feet): 44649.68445
Building Volume Daily (cubic feet): 2029.48205
On-Road Truck Travel (VMT): 28.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Concrete/Industrial saws	84	0.730	8.0
2	Rubber Tired Loaders	165	0.465	8.0

Phase 2 - Site Grading Assumptions

Start Month/Year for Phase 2: Feb '09
Phase 2 Duration: 1 months
On-Road Truck Travel (VMT): 1590
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Mar '09
Phase 3 Duration: 16 months
Start Month/Year for SubPhase Building: Mar '09
SubPhase Building Duration: 14.5 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Concrete/Industrial saws	84	0.730	8.0
5	Other Equipment	190	0.620	8.0
2	Rough Terrain Forklifts	94	0.475	8.0

Start Month/Year for SubPhase Architectural Coatings: Apr '10
SubPhase Architectural Coatings Duration: 1 months
Start Month/Year for SubPhase Asphalt: May '10
SubPhase Asphalt Duration: .5 months
Acres to be Paved: 1.6
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Pavers	132	0.590	8.0
1	Rollers	114	0.430	8.0

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.07	0.95	0.40	0	0.00
Hearth	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	6.16	-	-	-	-
Architectural Coatings	0.30	-	-	-	-
TOTALS(lbs/day,unmitigated)	6.54	0.95	0.40	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Apartments low rise	3.56	5.83	42.18	0.03	5.06
TOTAL EMISSIONS (lbs/day)	3.56	5.83	42.18	0.03	5.06

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Apartments low rise	0.00	3.96 trips/dwelling unit	126.00	498.96
		Sum of Total Trips		498.96
		Total Vehicle Miles Traveled		3,338.29

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00

Motorcycle	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

The Trip Rate and/or Acreage values for Apartments low rise
have changed from the defaults 6.9/7.88 to 3.96/

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths
Demolition Truck Hauling Miles/Round Trip changed from 30 to 7.5
Architectural Coatings: # ROG/ft2 (residential) changed from 0.0185 to 0.00272
Architectural Coatings: # ROG/ft2 (non-res) changed from 0.0185 to 0.00116
Phase 2 mitigation measure Soil Disturbance: Rule 403 - Water 3X Daily
has been changed from off to on.

Changes made to the default values for Area

The hearth option switch changed from on to off.
The landscape year changed from 2005 to 2010.
The residential Arch. Coatings ROG emission factor changed from 0.0185 to 0.00272.
The nonresidential Arch. Coatings ROG emission factor changed from 0.0185 to 0.00116.

Changes made to the default values for Operations

The operational emission year changed from 2005 to 2010.

URBEMIS 2002 For Windows 8.7.0

File Name: M:\Camarillo\9. Air Quality\URBEMIS Files\Neptune Marina\Parcel FF\Parcel FF.urb
Project Name: Parcel FF
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

Construction Start Month and Year: February, 2009
Construction Duration: 17.5
Total Land Use Area to be Developed: 2.04 acres
Maximum Acreage Disturbed Per Day: 1.02 acres
Single Family Units: 0 Multi-Family Units: 126
Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2009***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.85	-	0.85
Off-Road Diesel	3.78	23.12	31.57	-	0.75	0.75	0.00
On-Road Diesel	0.03	0.61	0.11	0.00	0.01	0.01	0.00
Worker Trips	0.04	0.09	0.93	0.00	0.00	0.00	0.00
Maximum lbs/day	3.85	23.82	32.61	0.00	1.61	0.76	0.85
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	10.20	-	10.20
Off-Road Diesel	8.61	59.26	68.48	-	2.50	2.50	0.00
On-Road Diesel	1.60	34.43	5.99	0.07	0.84	0.67	0.17
Worker Trips	0.04	0.11	1.16	0.00	0.01	0.00	0.01
Maximum lbs/day	10.25	93.80	75.63	0.07	13.55	3.17	10.38
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	14.11	95.40	113.07	-	3.89	3.89	0.00
Bldg Const Worker Trips	0.22	0.13	2.80	0.00	0.05	0.00	0.05
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00

Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	14.34	95.53	115.87	0.00	3.94	3.89	0.05
Max lbs/day all phases	14.34	95.53	115.87	0.07	14.27	3.89	10.38

*** 2010***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	14.11	90.76	116.45	-	3.51	3.51	0.00
Bldg Const Worker Trips	0.20	0.12	2.58	0.00	0.05	0.00	0.05
Arch Coatings Off-Gas	35.75	-	-	-	-	-	-
Arch Coatings Worker Trips	0.19	0.09	2.43	0.00	0.05	0.00	0.05
Asphalt Off-Gas	0.38	-	-	-	-	-	-
Asphalt Off-Road Diesel	4.00	23.19	33.99	-	0.64	0.64	0.00
Asphalt On-Road Diesel	0.06	0.91	0.23	0.00	0.03	0.03	0.00
Asphalt Worker Trips	0.02	0.01	0.21	0.00	0.00	0.00	0.00
Maximum lbs/day	50.24	114.96	153.32	0.00	4.29	4.19	0.10
Max lbs/day all phases	50.24	114.96	153.32	0.00	4.29	4.19	0.10

Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Feb '09
Phase 1 Duration: 0.5 months
Building Volume Total (cubic feet): 44649.68445
Building Volume Daily (cubic feet): 2029.48205
On-Road Truck Travel (VMT): 28.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Concrete/Industrial saws	84	0.730	8.0
2	Rubber Tired Loaders	165	0.465	8.0

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Feb '09
Phase 2 Duration: 1 months
On-Road Truck Travel (VMT): 1590
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Mar '09
Phase 3 Duration: 16 months
Start Month/Year for SubPhase Building: Mar '09
SubPhase Building Duration: 14.5 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Concrete/Industrial saws	84	0.730	8.0
5	Other Equipment	190	0.620	8.0
2	Rough Terrain Forklifts	94	0.475	8.0

Start Month/Year for SubPhase Architectural Coatings: Apr '10
SubPhase Architectural Coatings Duration: 1 months
Start Month/Year for SubPhase Asphalt: May '10
SubPhase Asphalt Duration: .5 months
Acres to be Paved: 1.6
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Pavers	132	0.590	8.0
1	Rollers	114	0.430	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2009***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.85	-	0.85
Off-Road Diesel	3.78	23.12	31.57	-	0.75	0.75	0.00
On-Road Diesel	0.03	0.61	0.11	0.00	0.01	0.01	0.00
Worker Trips	0.04	0.09	0.93	0.00	0.00	0.00	0.00
Maximum lbs/day	3.85	23.82	32.61	0.00	1.61	0.76	0.85
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	3.26	-	3.26
Off-Road Diesel	8.61	59.26	68.48	-	2.50	2.50	0.00
On-Road Diesel	1.60	34.43	5.99	0.07	0.84	0.67	0.17
Worker Trips	0.04	0.11	1.16	0.00	0.01	0.00	0.01
Maximum lbs/day	10.25	93.80	75.63	0.07	6.61	3.17	3.44
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	14.11	95.40	113.07	-	3.89	3.89	0.00
Bldg Const Worker Trips	0.22	0.13	2.80	0.00	0.05	0.00	0.05
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	14.34	95.53	115.87	0.00	3.94	3.89	0.05
Max lbs/day all phases	14.34	95.53	115.87	0.07	7.33	3.89	3.44
*** 2010***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00

On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	14.11	90.76	116.45	-	3.51	3.51	0.00
Bldg Const Worker Trips	0.20	0.12	2.58	0.00	0.05	0.00	0.05
Arch Coatings Off-Gas	35.75	-	-	-	-	-	-
Arch Coatings Worker Trips	0.19	0.09	2.43	0.00	0.05	0.00	0.05
Asphalt Off-Gas	0.38	-	-	-	-	-	-
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Asphalt On-Road Diesel	0.06	0.91	0.23	0.00	0.03	0.03	0.00
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Maximum lbs/day	50.24	114.96	153.32	0.00	4.29	4.19	0.10
Max lbs/day all phases	50.24	114.96	153.32	0.00	4.29	4.19	0.10

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Rule 403 - Water 3X Daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 68.0%)
Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Feb '09
Phase 1 Duration: 0.5 months
Building Volume Total (cubic feet): 44649.68445
Building Volume Daily (cubic feet): 2029.48205
On-Road Truck Travel (VMT): 28.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Concrete/Industrial saws	84	0.730	8.0
2	Rubber Tired Loaders	165	0.465	8.0

Phase 2 - Site Grading Assumptions

Start Month/Year for Phase 2: Feb '09
Phase 2 Duration: 1 months
On-Road Truck Travel (VMT): 1590
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Mar '09
Phase 3 Duration: 16 months
Start Month/Year for SubPhase Building: Mar '09
SubPhase Building Duration: 14.5 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Concrete/Industrial saws	84	0.730	8.0
5	Other Equipment	190	0.620	8.0
2	Rough Terrain Forklifts	94	0.475	8.0

Start Month/Year for SubPhase Architectural Coatings: Apr '10
SubPhase Architectural Coatings Duration: 1 months
Start Month/Year for SubPhase Asphalt: May '10
SubPhase Asphalt Duration: .5 months
Acres to be Paved: 1.6
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Pavers	132	0.590	8.0
1	Rollers	114	0.430	8.0

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.07	0.95	0.40	0	0.00
Hearth - No summer emissions					
Landscaping	0.09	0.01	0.63	0.00	0.00
Consumer Prdcts	6.16	-	-	-	-
Architectural Coatings	0.30	-	-	-	-
TOTALS(lbs/day,unmitigated)	6.63	0.96	1.04	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Apartments low rise	4.89	4.03	44.54	0.03	5.06
TOTAL EMISSIONS (lbs/day)	4.89	4.03	44.54	0.03	5.06

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 90 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Apartments low rise	0.00	3.96 trips/dwelling unit	126.00	498.96
		Sum of Total Trips		498.96
		Total Vehicle Miles Traveled		3,338.29

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00

Motorcycle	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

The Trip Rate and/or Acreage values for Apartments low rise
have changed from the defaults 6.9/7.88 to 3.96/

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths
Demolition Truck Hauling Miles/Round Trip changed from 30 to 7.5
Architectural Coatings: # ROG/ft2 (residential) changed from 0.0185 to 0.00272
Architectural Coatings: # ROG/ft2 (non-res) changed from 0.0185 to 0.00116
Phase 2 mitigation measure Soil Disturbance: Rule 403 - Water 3X Daily
has been changed from off to on.

Changes made to the default values for Area

The hearth option switch changed from on to off.
The landscape year changed from 2005 to 2010.
The residential Arch. Coatings ROG emission factor changed from 0.0185 to 0.00272.
The nonresidential Arch. Coatings ROG emission factor changed from 0.0185 to 0.00116.

Changes made to the default values for Operations

The operational emission year changed from 2005 to 2010.

LST Appendix C - URBEMIS Output for Parcel 9U

URBEMIS 2002 For Windows 8.7.0

File Name: M:\Camarillo\9. Air Quality\URBEMIS Files\Neptune Marina\Parcel 9U\Parcel 9U.urb
Project Name: Parcel 9U
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	19.98	132.21	170.24	0.01	10.66	5.16	5.50
TOTALS (lbs/day, mitigated)	19.98	132.21	170.24	0.01	6.92	5.16	1.76

*** 2009 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	27.78	127.08	176.58	0.01	4.95	4.85	0.10
TOTALS (lbs/day, mitigated)	27.78	127.08	176.58	0.01	4.95	4.85	0.10

*** 2010 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	4.25	23.80	34.34	0.00	0.66	0.65	0.01
TOTALS (lbs/day, mitigated)	4.25	23.80	34.34	0.00	0.66	0.65	0.01

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.48	3.71	3.74	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	11.96	10.86	113.41	0.09	13.37

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	12.45	14.57	117.15	0.09	13.38

URBEMIS 2002 For Windows 8.7.0

File Name: M:\Camarillo\9. Air Quality\URBEMIS Files\Neptune Marina\Parcel 9U\Parcel 9U.urb
Project Name: Parcel 9U
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

CONSTRUCTION EMISSION ESTIMATES

*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	19.98	132.21	170.24	0.01	10.66	5.16	5.50
TOTALS (lbs/day, mitigated)	19.98	132.21	170.24	0.01	6.92	5.16	1.76

*** 2009 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	27.78	127.08	176.58	0.01	4.95	4.85	0.10
TOTALS (lbs/day, mitigated)	27.78	127.08	176.58	0.01	4.95	4.85	0.10

*** 2010 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	4.25	23.80	34.34	0.00	0.66	0.65	0.01
TOTALS (lbs/day, mitigated)	4.25	23.80	34.34	0.00	0.66	0.65	0.01

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.39	3.70	3.10	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	9.11	15.67	110.21	0.07	13.37

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	9.50	19.36	113.32	0.07	13.38

URBEMIS 2002 For Windows 8.7.0

File Name: M:\Camarillo\9. Air Quality\URBEMIS Files\Neptune Marina\Parcel 9U\Parcel 9U.urb
Project Name: Parcel 9U
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Winter)

Construction Start Month and Year: August, 2008
Construction Duration: 18
Total Land Use Area to be Developed: 2.2 acres
Maximum Acreage Disturbed Per Day: 0.55 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 144000

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	5.50	-	5.50
Off-Road Diesel	2.41	15.31	19.95	-	0.57	0.57	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.02	0.03	0.64	0.00	0.00	0.00	0.00
Maximum lbs/day	2.43	15.34	20.59	0.00	6.07	0.57	5.50
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.25	131.31	152.53	-	5.13	5.13	0.00
Bldg Const Worker Trips	0.74	0.90	17.72	0.01	0.08	0.03	0.05
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00

Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	19.98	132.21	170.24	0.01	5.21	5.16	0.05
Max lbs/day all phases	19.98	132.21	170.24	0.01	10.66	5.16	5.50

*** 2009***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.25	126.06	156.26	-	4.82	4.82	0.00
Bldg Const Worker Trips	0.71	0.89	17.48	0.01	0.08	0.03	0.05
Arch Coatings Off-Gas	7.59	-	-	-	-	-	-
Arch Coatings Worker Trips	0.23	0.13	2.84	0.00	0.05	0.00	0.05
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	27.78	127.08	176.58	0.01	4.95	4.85	0.10
Max lbs/day all phases	27.78	127.08	176.58	0.01	4.95	4.85	0.10

*** 2010***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.20	-	-	-	-	-	-
Asphalt Off-Road Diesel	4.00	23.19	33.99	-	0.64	0.64	0.00
Asphalt On-Road Diesel	0.03	0.59	0.12	0.00	0.01	0.01	0.00
Asphalt Worker Trips	0.02	0.01	0.23	0.00	0.00	0.00	0.00
Maximum lbs/day	4.25	23.80	34.34	0.00	0.66	0.65	0.01
Max lbs/day all phases	4.25	23.80	34.34	0.00	0.66	0.65	0.01

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Aug '08
Phase 2 Duration: 0.5 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Aug '08

Phase 3 Duration: 17.5 months
Start Month/Year for SubPhase Building: Aug '08
SubPhase Building Duration: 14.5 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Bore/Drill Rigs	218	0.750	8.0
1	Cranes	190	0.430	8.0
2	Crawler Tractors	143	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
2	Rough Terrain Forklifts	94	0.475	8.0
2	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Start Month/Year for SubPhase Architectural Coatings: Oct '09
SubPhase Architectural Coatings Duration: 2 months
Start Month/Year for SubPhase Asphalt: Jan '10
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 1.7
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Pavers	132	0.590	8.0
1	Rollers	114	0.430	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	1.76	-	1.76
Off-Road Diesel	2.41	15.31	19.95	-	0.57	0.57	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.02	0.03	0.64	0.00	0.00	0.00	0.00
Maximum lbs/day	2.43	15.34	20.59	0.00	2.33	0.57	1.76
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.25	131.31	152.53	-	5.13	5.13	0.00
Bldg Const Worker Trips	0.74	0.90	17.72	0.01	0.08	0.03	0.05
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	19.98	132.21	170.24	0.01	5.21	5.16	0.05
Max lbs/day all phases	19.98	132.21	170.24	0.01	6.92	5.16	1.76

*** 2009***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.25	126.06	156.26	-	4.82	4.82	0.00
Bldg Const Worker Trips	0.71	0.89	17.48	0.01	0.08	0.03	0.05
Arch Coatings Off-Gas	7.59	-	-	-	-	-	-
Arch Coatings Worker Trips	0.23	0.13	2.84	0.00	0.05	0.00	0.05
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00

Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	27.78	127.08	176.58	0.01	4.95	4.85	0.10
Max lbs/day all phases	27.78	127.08	176.58	0.01	4.95	4.85	0.10

*** 2010***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.20	-	-	-	-	-	-
Asphalt Off-Road Diesel	4.00	23.19	33.99	-	0.64	0.64	0.00
Asphalt On-Road Diesel	0.03	0.59	0.12	0.00	0.01	0.01	0.00
Asphalt Worker Trips	0.02	0.01	0.23	0.00	0.00	0.00	0.00
Maximum lbs/day	4.25	23.80	34.34	0.00	0.66	0.65	0.01
Max lbs/day all phases	4.25	23.80	34.34	0.00	0.66	0.65	0.01

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Rule 403 - Water 3X Daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 68.0%)
Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Aug '08
Phase 2 Duration: 0.5 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Aug '08
Phase 3 Duration: 17.5 months
Start Month/Year for SubPhase Building: Aug '08
SubPhase Building Duration: 14.5 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Bore/Drill Rigs	218	0.750	8.0
1	Cranes	190	0.430	8.0
2	Crawler Tractors	143	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
2	Rough Terrain Forklifts	94	0.475	8.0
2	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Start Month/Year for SubPhase Architectural Coatings: Oct '09
SubPhase Architectural Coatings Duration: 2 months
Start Month/Year for SubPhase Asphalt: Jan '10
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 1.7
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Pavers	132	0.590	8.0
1	Rollers	114	0.430	8.0

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.27	3.70	3.10	0	0.01
Hearth	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	0.00	-	-	-	-
Architectural Coatings	0.13	-	-	-	-
TOTALS(lbs/day,unmitigated)	0.39	3.70	3.10	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Hotel	9.11	15.67	110.21	0.07	13.37
TOTAL EMISSIONS (lbs/day)	9.11	15.67	110.21	0.07	13.37

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 50 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Hotel		5.34 trips/rooms	288.00	1,537.63
			Sum of Total Trips	1,537.63
			Total Vehicle Miles Traveled	8,826.01

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00

Motorcycle	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			
% of Trips - Commercial (by land use)						
Hotel				5.0	2.5	92.5

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths
Architectural Coatings: # ROG/ft2 (residential) changed from 0.0185 to 0.00272
Architectural Coatings: # ROG/ft2 (non-res) changed from 0.0185 to 0.00116
Phase 2 mitigation measure Soil Disturbance: Rule 403 - Water 3X Daily
has been changed from off to on.

Changes made to the default values for Area

The hearth option switch changed from on to off.
The landscape year changed from 2005 to 2010.
The residential Arch. Coatings ROG emission factor changed from 0.0185 to 0.00272.
The nonresidential Arch. Coatings ROG emission factor changed from 0.0185 to 0.00116.

Changes made to the default values for Operations

The operational emission year changed from 2005 to 2010.

URBEMIS 2002 For Windows 8.7.0

File Name: M:\Camarillo\9. Air Quality\URBEMIS Files\Neptune Marina\Parcel 9U\Parcel 9U.urb
Project Name: Parcel 9U
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

Construction Start Month and Year: August, 2008
Construction Duration: 18
Total Land Use Area to be Developed: 2.2 acres
Maximum Acreage Disturbed Per Day: 0.55 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 144000

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	5.50	-	5.50
Off-Road Diesel	2.41	15.31	19.95	-	0.57	0.57	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.02	0.03	0.64	0.00	0.00	0.00	0.00
Maximum lbs/day	2.43	15.34	20.59	0.00	6.07	0.57	5.50
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.25	131.31	152.53	-	5.13	5.13	0.00
Bldg Const Worker Trips	0.74	0.90	17.72	0.01	0.08	0.03	0.05
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00

Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	19.98	132.21	170.24	0.01	5.21	5.16	0.05
Max lbs/day all phases	19.98	132.21	170.24	0.01	10.66	5.16	5.50

*** 2009***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.25	126.06	156.26	-	4.82	4.82	0.00
Bldg Const Worker Trips	0.71	0.89	17.48	0.01	0.08	0.03	0.05
Arch Coatings Off-Gas	7.59	-	-	-	-	-	-
Arch Coatings Worker Trips	0.23	0.13	2.84	0.00	0.05	0.00	0.05
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	27.78	127.08	176.58	0.01	4.95	4.85	0.10
Max lbs/day all phases	27.78	127.08	176.58	0.01	4.95	4.85	0.10

*** 2010***

Phase 1 - Demolition Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 3 - Building Construction

Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.20	-	-	-	-	-	-
Asphalt Off-Road Diesel	4.00	23.19	33.99	-	0.64	0.64	0.00
Asphalt On-Road Diesel	0.03	0.59	0.12	0.00	0.01	0.01	0.00
Asphalt Worker Trips	0.02	0.01	0.23	0.00	0.00	0.00	0.00
Maximum lbs/day	4.25	23.80	34.34	0.00	0.66	0.65	0.01
Max lbs/day all phases	4.25	23.80	34.34	0.00	0.66	0.65	0.01

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Aug '08
Phase 2 Duration: 0.5 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Aug '08

Phase 3 Duration: 17.5 months
Start Month/Year for SubPhase Building: Aug '08
SubPhase Building Duration: 14.5 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Bore/Drill Rigs	218	0.750	8.0
1	Cranes	190	0.430	8.0
2	Crawler Tractors	143	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
2	Rough Terrain Forklifts	94	0.475	8.0
2	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Start Month/Year for SubPhase Architectural Coatings: Oct '09
SubPhase Architectural Coatings Duration: 2 months
Start Month/Year for SubPhase Asphalt: Jan '10
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 1.7
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Pavers	132	0.590	8.0
1	Rollers	114	0.430	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	1.76	-	1.76
Off-Road Diesel	2.41	15.31	19.95	-	0.57	0.57	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.02	0.03	0.64	0.00	0.00	0.00	0.00
Maximum lbs/day	2.43	15.34	20.59	0.00	2.33	0.57	1.76
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.25	131.31	152.53	-	5.13	5.13	0.00
Bldg Const Worker Trips	0.74	0.90	17.72	0.01	0.08	0.03	0.05
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	19.98	132.21	170.24	0.01	5.21	5.16	0.05
Max lbs/day all phases	19.98	132.21	170.24	0.01	6.92	5.16	1.76

*** 2009***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.25	126.06	156.26	-	4.82	4.82	0.00
Bldg Const Worker Trips	0.71	0.89	17.48	0.01	0.08	0.03	0.05
Arch Coatings Off-Gas	7.59	-	-	-	-	-	-
Arch Coatings Worker Trips	0.23	0.13	2.84	0.00	0.05	0.00	0.05
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00

Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	27.78	127.08	176.58	0.01	4.95	4.85	0.10
Max lbs/day all phases	27.78	127.08	176.58	0.01	4.95	4.85	0.10

*** 2010***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.20	-	-	-	-	-	-
Asphalt Off-Road Diesel	4.00	23.19	33.99	-	0.64	0.64	0.00
Asphalt On-Road Diesel	0.03	0.59	0.12	0.00	0.01	0.01	0.00
Asphalt Worker Trips	0.02	0.01	0.23	0.00	0.00	0.00	0.00
Maximum lbs/day	4.25	23.80	34.34	0.00	0.66	0.65	0.01
Max lbs/day all phases	4.25	23.80	34.34	0.00	0.66	0.65	0.01

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Rule 403 - Water 3X Daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 68.0%)
Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Aug '08
Phase 2 Duration: 0.5 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Aug '08
Phase 3 Duration: 17.5 months
Start Month/Year for SubPhase Building: Aug '08
SubPhase Building Duration: 14.5 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Bore/Drill Rigs	218	0.750	8.0
1	Cranes	190	0.430	8.0
2	Crawler Tractors	143	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
2	Rough Terrain Forklifts	94	0.475	8.0
2	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Start Month/Year for SubPhase Architectural Coatings: Oct '09
SubPhase Architectural Coatings Duration: 2 months
Start Month/Year for SubPhase Asphalt: Jan '10
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 1.7
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Pavers	132	0.590	8.0
1	Rollers	114	0.430	8.0

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.27	3.70	3.10	0	0.01
Hearth - No summer emissions					
Landscaping	0.09	0.01	0.63	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
Architectural Coatings	0.13	-	-	-	-
TOTALS(lbs/day,unmitigated)	0.48	3.71	3.74	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Hotel	11.96	10.86	113.41	0.09	13.37
TOTAL EMISSIONS (lbs/day)	11.96	10.86	113.41	0.09	13.37

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 90 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Hotel		5.34 trips/rooms	288.00	1,537.63
			Sum of Total Trips	1,537.63
			Total Vehicle Miles Traveled	8,826.01

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00

Motorcycle	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			
% of Trips - Commercial (by land use)						
Hotel				5.0	2.5	92.5

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths
Architectural Coatings: # ROG/ft2 (residential) changed from 0.0185 to 0.00272
Architectural Coatings: # ROG/ft2 (non-res) changed from 0.0185 to 0.00116
Phase 2 mitigation measure Soil Disturbance: Rule 403 - Water 3X Daily
has been changed from off to on.

Changes made to the default values for Area

The hearth option switch changed from on to off.
The landscape year changed from 2005 to 2010.
The residential Arch. Coatings ROG emission factor changed from 0.0185 to 0.00272.
The nonresidential Arch. Coatings ROG emission factor changed from 0.0185 to 0.00116.

Changes made to the default values for Operations

The operational emission year changed from 2005 to 2010.

LST Appendix D

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* ISCST3 (02035): NEPTUNE MARINA LST (9U North - CO)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  1-HR VALUES FOR SOURCE GROUP: 2
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ___________  ___________  ____________  ______  _______  ________  ________  ________
  364863.37500 3760413.25000     443.74420    0.00    1-HR  2         1ST         NA
  364858.40600 3760448.50000     407.85150    0.00    1-HR  2         1ST         NA
  364845.40600 3760376.25000     306.86877    0.00    1-HR  2         1ST         NA
  364854.03100 3760344.50000     355.42273    0.00    1-HR  2         1ST         NA
  364862.62500 3760312.75000     468.33710    0.00    1-HR  2         1ST         NA
  364838.62500 3760409.75000     399.62616    0.00    1-HR  2         1ST         NA
  364833.65600 3760445.00000     401.39893    0.00    1-HR  2         1ST         NA
  364820.93800 3760371.75000     250.75140    0.00    1-HR  2         1ST         NA
  364830.06300 3760338.00000     366.41867    0.00    1-HR  2         1ST         NA
  364839.21900 3760304.25000     447.13260    0.00    1-HR  2         1ST         NA
  364813.87500 3760406.25000     353.49323    0.00    1-HR  2         1ST         NA
  364808.87500 3760441.50000     384.48340    0.00    1-HR  2         1ST         NA
  364795.75000 3760369.75000     233.02599    0.00    1-HR  2         1ST         NA
  364804.06300 3760339.25000     345.26410    0.00    1-HR  2         1ST         NA
  364812.34400 3760308.50000     413.98682    0.00    1-HR  2         1ST         NA
  364789.12500 3760402.75000     308.21967    0.00    1-HR  2         1ST         NA
  364784.12500 3760438.00000     360.10941    0.00    1-HR  2         1ST         NA
  364771.25000 3760365.50000     244.24330    0.00    1-HR  2         1ST         NA
  364780.00000 3760333.25000     345.83304    0.00    1-HR  2         1ST         NA
  364788.75000 3760300.75000     390.33502    0.00    1-HR  2         1ST         NA
  364764.37500 3760399.25000     265.68176    0.00    1-HR  2         1ST         NA
  364759.37500 3760434.50000     331.03552    0.00    1-HR  2         1ST         NA
  364746.71900 3760361.25000     252.04192    0.00    1-HR  2         1ST         NA
  364755.93800 3760327.00000     341.42212    0.00    1-HR  2         1ST         NA
  364765.15600 3760293.00000     362.39594    0.00    1-HR  2         1ST         NA
  364739.62500 3760395.75000     226.94901    0.00    1-HR  2         1ST         NA
  364734.62500 3760430.75000     299.24619    0.00    1-HR  2         1ST         NA
  365204.62500 3760522.50000     921.66083    0.00    1-HR  2         1ST         NA
  365179.68800 3760500.75000     909.26782    0.00    1-HR  2         1ST         NA
  365154.62500 3760522.25000     751.26904    0.00    1-HR  2         1ST         NA
  365129.62500 3760522.25000     522.43005    0.00    1-HR  2         1ST         NA
  365104.62500 3760522.00000     312.08371    0.00    1-HR  2         1ST         NA
  365079.62500 3760522.00000     336.08279    0.00    1-HR  2         1ST         NA
  365054.68800 3760500.50000     584.32159    0.00    1-HR  2         1ST         NA
  365029.68800 3760500.25000     612.54388    0.00    1-HR  2         1ST         NA
  365029.53100 3760543.50000     359.68607    0.00    1-HR  2         1ST         NA
  365004.68800 3760500.25000     597.72504    0.00    1-HR  2         1ST         NA
  364979.68800 3760500.25000     552.25110    0.00    1-HR  2         1ST         NA
  364979.53100 3760543.25000     461.18848    0.00    1-HR  2         1ST         NA
  364954.68800 3760500.00000     522.01343    0.00    1-HR  2         1ST         NA
  364929.68800 3760500.00000     489.45154    0.00    1-HR  2         1ST         NA
  364929.53100 3760543.00000     459.50607    0.00    1-HR  2         1ST         NA
  364905.75000 3760485.00000     426.62289    0.00    1-HR  2         1ST         NA
  364904.62500 3760521.50000     444.35510    0.00    1-HR  2         1ST         NA
  364880.84400 3760483.75000     363.10480    0.00    1-HR  2         1ST         NA
  364879.62500 3760521.25000     419.23660    0.00    1-HR  2         1ST         NA
  364855.93800 3760482.50000     301.52002    0.00    1-HR  2         1ST         NA
  364854.62500 3760521.25000     384.30566    0.00    1-HR  2         1ST         NA
  364831.00000 3760481.50000     306.78558    0.00    1-HR  2         1ST         NA
  364829.62500 3760521.25000     344.17572    0.00    1-HR  2         1ST         NA
  364806.09400 3760480.25000     316.44836    0.00    1-HR  2         1ST         NA
  364804.62500 3760521.00000     301.86542    0.00    1-HR  2         1ST         NA
  364781.18800 3760479.00000     319.53064    0.00    1-HR  2         1ST         NA
  364779.62500 3760521.00000     260.91257    0.00    1-HR  2         1ST         NA
  364755.87500 3760483.00000     308.11679    0.00    1-HR  2         1ST         NA
  364754.62500 3760521.00000     222.61876    0.00    1-HR  2         1ST         NA
  364730.93800 3760482.25000     303.00491    0.00    1-HR  2         1ST         NA
  364729.62500 3760520.75000     229.07391    0.00    1-HR  2         1ST         NA
  365237.15600 3760448.25000    1396.51660    0.00    1-HR  2         1ST         NA
  365250.87500 3760414.75000    1571.54578    0.00    1-HR  2         1ST         NA
  365273.87500 3760369.75000    1885.35815    0.00    1-HR  2         1ST         NA
  365333.75000 3760269.00000    5916.35205    0.00    1-HR  2         1ST         NA
  365372.15600 3760209.50000    2793.90967    0.00    1-HR  2         1ST         NA
  365477.31300 3760208.00000    1378.65686    0.00    1-HR  2         1ST         NA
  365477.31300 3760244.75000    1760.76953    0.00    1-HR  2         1ST         NA
  365457.78100 3760244.75000    2021.23218    0.00    1-HR  2         1ST         NA
  365339.75000 3760430.50000    1059.00562    0.00    1-HR  2         1ST         NA
  365684.93800 3760428.75000     332.13174    0.00    1-HR  2         1ST         NA
  365685.68800 3760473.25000     302.25391    0.00    1-HR  2         1ST         NA
  365435.59400 3760475.00000     741.91992    0.00    1-HR  2         1ST         NA
  365435.65600 3760543.75000     479.19983    0.00    1-HR  2         1ST         NA
  365229.53100 3760544.00000     526.16180    0.00    1-HR  2         1ST         NA
  365229.68800 3760501.00000     989.17419    0.00    1-HR  2         1ST         NA
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* ISCST3 (02035): NEPTUNE MARINA LST (9U North - CO)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  8-HR VALUES FOR SOURCE GROUP: 2
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ___________  ___________  ___________  _______  _______  ________  _________  ________
  365586.06300 3760379.25000     262.30814     0.00    8-HR  2          1ST          NA
  365561.40600 3760379.25000     340.71375     0.00    8-HR  2          1ST          NA
  365536.75000 3760379.50000     431.17932     0.00    8-HR  2          1ST          NA
  365512.09400 3760379.50000     551.98199     0.00    8-HR  2          1ST          NA
  365487.43800 3760379.75000     752.46014     0.00    8-HR  2          1ST          NA
  365462.78100 3760379.75000     900.79419     0.00    8-HR  2          1ST          NA
  365438.12500 3760380.00000     941.58044     0.00    8-HR  2          1ST          NA
  365413.46900 3760380.00000    1180.16614     0.00    8-HR  2          1ST          NA
  365388.81300 3760380.25000     837.97522     0.00    8-HR  2          1ST          NA
  365702.18800 3760360.75000      93.15195     0.00    8-HR  2          1ST          NA
  365744.90600 3760392.50000      76.58782     0.00    8-HR  2          1ST          NA
  365659.90600 3760353.75000     121.53552     0.00    8-HR  2          1ST          NA
  365635.25000 3760354.00000     146.27908     0.00    8-HR  2          1ST          NA
  365610.59400 3760354.00000     177.68420     0.00    8-HR  2          1ST          NA
  365585.93800 3760354.25000     229.29886     0.00    8-HR  2          1ST          NA
  365561.28100 3760354.25000     311.53650     0.00    8-HR  2          1ST          NA
  365536.62500 3760354.50000     434.04083     0.00    8-HR  2          1ST          NA
  365511.96900 3760354.50000     604.55505     0.00    8-HR  2          1ST          NA
  365487.31300 3760354.75000     799.63574     0.00    8-HR  2          1ST          NA
  365462.65600 3760354.75000    1216.04297     0.00    8-HR  2          1ST          NA
  365438.00000 3760355.00000    1434.96924     0.00    8-HR  2          1ST          NA
  365413.34400 3760355.00000    1749.63489     0.00    8-HR  2          1ST          NA
  365388.68800 3760355.25000    1395.33093     0.00    8-HR  2          1ST          NA
  365702.06300 3760335.75000      79.64790     0.00    8-HR  2          1ST          NA
  365737.28100 3760350.00000      70.38077     0.00    8-HR  2          1ST          NA
  365762.37500 3760374.75000      68.20056     0.00    8-HR  2          1ST          NA
  365777.40600 3760409.50000      65.21197     0.00    8-HR  2          1ST          NA
  365659.78100 3760328.75000     102.65754     0.00    8-HR  2          1ST          NA
  365635.12500 3760329.00000     126.81370     0.00    8-HR  2          1ST          NA
  365610.46900 3760329.00000     158.79420     0.00    8-HR  2          1ST          NA
  365585.81300 3760329.25000     202.96848     0.00    8-HR  2          1ST          NA
  365561.15600 3760329.25000     264.49051     0.00    8-HR  2          1ST          NA
  365536.50000 3760329.50000     356.24008     0.00    8-HR  2          1ST          NA
  365511.84400 3760329.50000     536.51379     0.00    8-HR  2          1ST          NA
  365487.18800 3760329.75000     849.21710     0.00    8-HR  2          1ST          NA
  365462.53100 3760329.75000    1349.98853     0.00    8-HR  2          1ST          NA
  365437.87500 3760330.00000    2255.64111     0.00    8-HR  2          1ST          NA
  365413.21900 3760330.00000    2561.44336     0.00    8-HR  2          1ST          NA
  365706.34400 3760312.50000      57.61398     0.00    8-HR  2          1ST          NA
  365728.34400 3760321.50000      56.29272     0.00    8-HR  2          1ST          NA
  365750.34400 3760330.50000      54.33002     0.00    8-HR  2          1ST          NA
  365781.75000 3760361.25000      57.87132     0.00    8-HR  2          1ST          NA
  365791.12500 3760383.00000      60.00515     0.00    8-HR  2          1ST          NA
  365800.53100 3760404.75000      58.99739     0.00    8-HR  2          1ST          NA
  365684.31300 3760303.75000      64.04974     0.00    8-HR  2          1ST          NA
  365659.65600 3760303.75000      75.05673     0.00    8-HR  2          1ST          NA
  365635.00000 3760304.00000      89.20891     0.00    8-HR  2          1ST          NA
  365610.34400 3760304.00000     110.99477     0.00    8-HR  2          1ST          NA
  365585.68800 3760304.25000     144.05643     0.00    8-HR  2          1ST          NA
  365561.03100 3760304.25000     191.39801     0.00    8-HR  2          1ST          NA
  365536.37500 3760304.50000     264.74088     0.00    8-HR  2          1ST          NA
  365511.71900 3760304.50000     380.91080     0.00    8-HR  2          1ST          NA
  365487.06300 3760304.75000     583.81171     0.00    8-HR  2          1ST          NA
  365462.40600 3760304.75000    1038.67615     0.00    8-HR  2          1ST          NA
  365437.75000 3760305.00000    2108.69287     0.00    8-HR  2          1ST          NA
  365705.34400 3760287.25000      53.77946     0.00    8-HR  2          1ST          NA
  365726.46900 3760295.75000      49.16139     0.00    8-HR  2          1ST          NA
  365747.59400 3760304.25000      44.88619     0.00    8-HR  2          1ST          NA
  365768.71900 3760313.00000      40.93233     0.00    8-HR  2          1ST          NA
  365798.87500 3760342.50000      45.74567     0.00    8-HR  2          1ST          NA
  365807.87500 3760363.25000      50.75601     0.00    8-HR  2          1ST          NA
  365816.87500 3760384.25000      53.04527     0.00    8-HR  2          1ST          NA
  365825.90600 3760405.25000      52.83806     0.00    8-HR  2          1ST          NA
  365684.18800 3760278.75000      58.87052     0.00    8-HR  2          1ST          NA
  365659.53100 3760278.75000      69.07081     0.00    8-HR  2          1ST          NA
  365634.87500 3760279.00000      82.34724     0.00    8-HR  2          1ST          NA
  365610.21900 3760279.00000      99.82339     0.00    8-HR  2          1ST          NA
  365585.56300 3760279.25000     123.91689     0.00    8-HR  2          1ST          NA
  365560.90600 3760279.25000     159.10826     0.00    8-HR  2          1ST          NA
  365536.25000 3760279.50000     210.40469     0.00    8-HR  2          1ST          NA
  365511.59400 3760279.50000     289.49881     0.00    8-HR  2          1ST          NA
  365486.93800 3760279.75000     417.63861     0.00    8-HR  2          1ST          NA
  365462.28100 3760279.75000     646.81714     0.00    8-HR  2          1ST          NA
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* ISCST3 (02035): NEPTUNE MARINA LST (9U North – NOx)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  1-HR VALUES FOR SOURCE GROUP: 2
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ___________  ___________  ___________  _______  _______  ________  ________  ________
  364863.37500 3760413.25000     331.85181     0.00    1-HR  2         1ST         NA
  364858.40600 3760448.50000     305.00964     0.00    1-HR  2         1ST         NA
  364845.40600 3760376.25000     229.49023     0.00    1-HR  2         1ST         NA
  364854.03100 3760344.50000     265.80103     0.00    1-HR  2         1ST         NA
  364862.62500 3760312.75000     350.24347     0.00    1-HR  2         1ST         NA
  364838.62500 3760409.75000     298.85834     0.00    1-HR  2         1ST         NA
  364833.65600 3760445.00000     300.18408     0.00    1-HR  2         1ST         NA
  364820.93800 3760371.75000     187.52313     0.00    1-HR  2         1ST         NA
  364830.06300 3760338.00000     274.02429     0.00    1-HR  2         1ST         NA
  364839.21900 3760304.25000     334.38580     0.00    1-HR  2         1ST         NA
  364813.87500 3760406.25000     264.35806     0.00    1-HR  2         1ST         NA
  364808.87500 3760441.50000     287.53391     0.00    1-HR  2         1ST         NA
  364795.75000 3760369.75000     174.26727     0.00    1-HR  2         1ST         NA
  364804.06300 3760339.25000     258.20392     0.00    1-HR  2         1ST         NA
  364812.34400 3760308.50000     309.59787     0.00    1-HR  2         1ST         NA
  364789.12500 3760402.75000     230.50047     0.00    1-HR  2         1ST         NA
  364784.12500 3760438.00000     269.30597     0.00    1-HR  2         1ST         NA
  364771.25000 3760365.50000     182.65610     0.00    1-HR  2         1ST         NA
  364780.00000 3760333.25000     258.62943     0.00    1-HR  2         1ST         NA
  364788.75000 3760300.75000     291.91003     0.00    1-HR  2         1ST         NA
  364764.37500 3760399.25000     198.68871     0.00    1-HR  2         1ST         NA
  364759.37500 3760434.50000     247.56319     0.00    1-HR  2         1ST         NA
  364746.71900 3760361.25000     188.48824     0.00    1-HR  2         1ST         NA
  364755.93800 3760327.00000     255.33076     0.00    1-HR  2         1ST         NA
  364765.15600 3760293.00000     271.01590     0.00    1-HR  2         1ST         NA
  364739.62500 3760395.75000     169.72264     0.00    1-HR  2         1ST         NA
  364734.62500 3760430.75000     223.78970     0.00    1-HR  2         1ST         NA
  365204.62500 3760522.50000     689.25922     0.00    1-HR  2         1ST         NA
  365179.68800 3760500.75000     679.99115     0.00    1-HR  2         1ST         NA
  365154.62500 3760522.25000     561.83264     0.00    1-HR  2         1ST         NA
  365129.62500 3760522.25000     390.69659     0.00    1-HR  2         1ST         NA
  365104.62500 3760522.00000     233.39017     0.00    1-HR  2         1ST         NA
  365079.62500 3760522.00000     251.33777     0.00    1-HR  2         1ST         NA
  365054.68800 3760500.50000     436.98187     0.00    1-HR  2         1ST         NA
  365029.68800 3760500.25000     458.08777     0.00    1-HR  2         1ST         NA
  365029.53100 3760543.50000     268.98938     0.00    1-HR  2         1ST         NA
  365004.68800 3760500.25000     447.00558     0.00    1-HR  2         1ST         NA
  364979.68800 3760500.25000     412.99814     0.00    1-HR  2         1ST         NA
  364979.53100 3760543.25000     344.89737     0.00    1-HR  2         1ST         NA
  364954.68800 3760500.00000     390.38507     0.00    1-HR  2         1ST         NA
  364929.68800 3760500.00000     366.03381     0.00    1-HR  2         1ST         NA
  364929.53100 3760543.00000     343.63925     0.00    1-HR  2         1ST         NA
  364905.75000 3760485.00000     319.04770     0.00    1-HR  2         1ST         NA
  364904.62500 3760521.50000     332.30862     0.00    1-HR  2         1ST         NA
  364880.84400 3760483.75000     271.54602     0.00    1-HR  2         1ST         NA
  364879.62500 3760521.25000     313.52393     0.00    1-HR  2         1ST         NA
  364855.93800 3760482.50000     225.49016     0.00    1-HR  2         1ST         NA
  364854.62500 3760521.25000     287.40097     0.00    1-HR  2         1ST         NA
  364831.00000 3760481.50000     229.42804     0.00    1-HR  2         1ST         NA
  364829.62500 3760521.25000     257.39001     0.00    1-HR  2         1ST         NA
  364806.09400 3760480.25000     236.65425     0.00    1-HR  2         1ST         NA
  364804.62500 3760521.00000     225.74847     0.00    1-HR  2         1ST         NA
  364781.18800 3760479.00000     238.95934     0.00    1-HR  2         1ST         NA
  364779.62500 3760521.00000     195.12212     0.00    1-HR  2         1ST         NA
  364755.87500 3760483.00000     230.42355     0.00    1-HR  2         1ST         NA
  364754.62500 3760521.00000     166.48428     0.00    1-HR  2         1ST         NA
  364730.93800 3760482.25000     226.60068     0.00    1-HR  2         1ST         NA
  364729.62500 3760520.75000     171.31174     0.00    1-HR  2         1ST         NA
  365237.15600 3760448.25000    1044.37769     0.00    1-HR  2         1ST         NA
  365250.87500 3760414.75000    1175.27234     0.00    1-HR  2         1ST         NA
  365273.87500 3760369.75000    1409.95520     0.00    1-HR  2         1ST         NA
  365333.75000 3760269.00000    4424.51318     0.00    1-HR  2         1ST         NA
  365372.15600 3760209.50000    2089.41089     0.00    1-HR  2         1ST         NA
  365477.31300 3760208.00000    1031.02136     0.00    1-HR  2         1ST         NA
  365477.31300 3760244.75000    1316.78235     0.00    1-HR  2         1ST         NA
  365457.78100 3760244.75000    1511.56799     0.00    1-HR  2         1ST         NA
  365339.75000 3760430.50000     791.97186     0.00    1-HR  2         1ST         NA
  365684.93800 3760428.75000     248.38300     0.00    1-HR  2         1ST         NA
  365685.68800 3760473.25000     226.03903     0.00    1-HR  2         1ST         NA
  365435.59400 3760475.00000     554.84094     0.00    1-HR  2         1ST         NA
  365435.65600 3760543.75000     358.36710     0.00    1-HR  2         1ST         NA
  365229.53100 3760544.00000     393.48740     0.00    1-HR  2         1ST         NA
  365229.68800 3760501.00000     739.74878     0.00    1-HR  2         1ST         NA
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* ISCST3 (02035): NEPTUNE MARINA LST (9U North – PM10)
* MODELING OPTIONS USED:
*  CONC        DDEP        URBAN FLAT  FLGPOL TOXICS                        NOCALM                ARDPLT
*         PLOT FILE OF  HIGH 1ST  HIGH 24-HR VALUES FOR SOURCE GROUP: 2
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (4(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC      DRY DEPO   ZELEV     AVE     GRP       HIVAL    NET ID
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X	Y	AVERAGE CONC	DRY DEPO	ZELEV	AVE	GRP	HIVAL	NET ID
365610.71900	3760379.00000	2.33224	0.00231	0.00	24-HR	2	1ST	NA
365586.06300	3760379.25000	3.04482	0.00284	0.00	24-HR	2	1ST	NA
365561.40600	3760379.25000	3.97646	0.00345	0.00	24-HR	2	1ST	NA
365536.75000	3760379.50000	5.06994	0.00426	0.00	24-HR	2	1ST	NA
365512.09400	3760379.50000	6.52586	0.00694	0.00	24-HR	2	1ST	NA
365487.43800	3760379.75000	9.02590	0.01045	0.00	24-HR	2	1ST	NA
365462.78100	3760379.75000	10.78477	0.01271	0.00	24-HR	2	1ST	NA
365438.12500	3760380.00000	11.22063	0.01118	0.00	24-HR	2	1ST	NA
365413.46900	3760380.00000	14.92254	0.00846	0.00	24-HR	2	1ST	NA
365388.81300	3760380.25000	11.63655	0.00816	0.00	24-HR	2	1ST	NA
365702.18800	3760360.75000	1.04708	0.00120	0.00	24-HR	2	1ST	NA
365744.90600	3760392.50000	0.87021	0.00099	0.00	24-HR	2	1ST	NA
365659.90600	3760353.75000	1.36966	0.00159	0.00	24-HR	2	1ST	NA
365635.25000	3760354.00000	1.65718	0.00194	0.00	24-HR	2	1ST	NA
365610.59400	3760354.00000	2.02561	0.00237	0.00	24-HR	2	1ST	NA
365585.93800	3760354.25000	2.64393	0.00293	0.00	24-HR	2	1ST	NA
365561.28100	3760354.25000	3.61675	0.00374	0.00	24-HR	2	1ST	NA
365536.62500	3760354.50000	5.07687	0.00495	0.00	24-HR	2	1ST	NA
365511.96900	3760354.50000	7.11154	0.00642	0.00	24-HR	2	1ST	NA
365487.31300	3760354.75000	9.50321	0.00991	0.00	24-HR	2	1ST	NA
365462.65600	3760354.75000	14.43540	0.01714	0.00	24-HR	2	1ST	NA
365438.00000	3760355.00000	17.96679	0.02114	0.00	24-HR	2	1ST	NA
365413.34400	3760355.00000	22.11521	0.01727	0.00	24-HR	2	1ST	NA
365388.68800	3760355.25000	19.88309	0.01426	0.00	24-HR	2	1ST	NA
365702.06300	3760335.75000	0.88113	0.00111	0.00	24-HR	2	1ST	NA
365737.28100	3760350.00000	0.78228	0.00093	0.00	24-HR	2	1ST	NA
365762.37500	3760374.75000	0.76593	0.00086	0.00	24-HR	2	1ST	NA
365777.40600	3760409.50000	0.74273	0.00084	0.00	24-HR	2	1ST	NA
365659.78100	3760328.75000	1.13660	0.00143	0.00	24-HR	2	1ST	NA
365635.12500	3760329.00000	1.40974	0.00170	0.00	24-HR	2	1ST	NA
365610.46900	3760329.00000	1.77333	0.00213	0.00	24-HR	2	1ST	NA
365585.81300	3760329.25000	2.27877	0.00275	0.00	24-HR	2	1ST	NA
365561.15600	3760329.25000	2.99466	0.00362	0.00	24-HR	2	1ST	NA
365536.50000	3760329.50000	4.11374	0.00488	0.00	24-HR	2	1ST	NA
365511.84400	3760329.50000	6.27476	0.00687	0.00	24-HR	2	1ST	NA
365487.18800	3760329.75000	10.03968	0.01031	0.00	24-HR	2	1ST	NA
365462.53100	3760329.75000	16.03640	0.01527	0.00	24-HR	2	1ST	NA
365437.87500	3760330.00000	26.65717	0.03263	0.00	24-HR	2	1ST	NA
365413.21900	3760330.00000	33.03356	0.04021	0.00	24-HR	2	1ST	NA
365706.34400	3760312.50000	0.67477	0.00094	0.00	24-HR	2	1ST	NA
365728.34400	3760321.50000	0.61544	0.00088	0.00	24-HR	2	1ST	NA
365750.34400	3760330.50000	0.59617	0.00082	0.00	24-HR	2	1ST	NA
365781.75000	3760361.25000	0.64396	0.00075	0.00	24-HR	2	1ST	NA
365791.12500	3760383.00000	0.67413	0.00075	0.00	24-HR	2	1ST	NA
365800.53100	3760404.75000	0.66837	0.00075	0.00	24-HR	2	1ST	NA
365684.31300	3760303.75000	0.76015	0.00109	0.00	24-HR	2	1ST	NA
365659.65600	3760303.75000	0.89219	0.00130	0.00	24-HR	2	1ST	NA
365635.00000	3760304.00000	1.06245	0.00159	0.00	24-HR	2	1ST	NA
365610.34400	3760304.00000	1.28608	0.00197	0.00	24-HR	2	1ST	NA
365585.68800	3760304.25000	1.59106	0.00250	0.00	24-HR	2	1ST	NA
365561.03100	3760304.25000	2.13191	0.00325	0.00	24-HR	2	1ST	NA
365536.37500	3760304.50000	2.98742	0.00436	0.00	24-HR	2	1ST	NA
365511.71900	3760304.50000	4.36877	0.00607	0.00	24-HR	2	1ST	NA
365487.06300	3760304.75000	6.84054	0.00903	0.00	24-HR	2	1ST	NA
365462.40600	3760304.75000	13.01573	0.01515	0.00	24-HR	2	1ST	NA
365437.75000	3760305.00000	27.00747	0.03058	0.00	24-HR	2	1ST	NA
365705.34400	3760287.25000	0.63475	0.00093	0.00	24-HR	2	1ST	NA
365726.46900	3760295.75000	0.58087	0.00082	0.00	24-HR	2	1ST	NA
365747.59400	3760304.25000	0.53125	0.00073	0.00	24-HR	2	1ST	NA
365768.71900	3760313.00000	0.48552	0.00066	0.00	24-HR	2	1ST	NA
365798.87500	3760342.50000	0.50334	0.00067	0.00	24-HR	2	1ST	NA
365807.87500	3760363.25000	0.56393	0.00067	0.00	24-HR	2	1ST	NA
365816.87500	3760384.25000	0.59445	0.00066	0.00	24-HR	2	1ST	NA
365825.90600	3760405.25000	0.59658	0.00066	0.00	24-HR	2	1ST	NA
365684.18800	3760278.75000	0.71252	0.00107	0.00	24-HR	2	1ST	NA
365659.53100	3760278.75000	0.84585	0.00128	0.00	24-HR	2	1ST	NA
365634.87500	3760279.00000	1.01719	0.00156	0.00	24-HR	2	1ST	NA
365610.21900	3760279.00000	1.24678	0.00193	0.00	24-HR	2	1ST	NA
365585.56300	3760279.25000	1.55824	0.00245	0.00	24-HR	2	1ST	NA
365560.90600	3760279.25000	2.00078	0.00318	0.00	24-HR	2	1ST	NA
365536.25000	3760279.50000	2.64622	0.00426	0.00	24-HR	2	1ST	NA
365511.59400	3760279.50000	3.64263	0.00589	0.00	24-HR	2	1ST	NA
365486.93800	3760279.75000	5.26322	0.00882	0.00	24-HR	2	1ST	NA

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* ISCST3 (02035): NEPTUNE MARINA LST (10R – CO)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  1-HR VALUES FOR SOURCE GROUP: 1
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ___________  ___________  ____________  ______  _______  ________  ________  ________
  364863.37500 3760413.25000     539.11639    0.00    1-HR  1         1ST         NA
  364858.40600 3760448.50000     351.73083    0.00    1-HR  1         1ST         NA
  364845.40600 3760376.25000     529.80444    0.00    1-HR  1         1ST         NA
  364854.03100 3760344.50000     562.96838    0.00    1-HR  1         1ST         NA
  364862.62500 3760312.75000     493.13806    0.00    1-HR  1         1ST         NA
  364838.62500 3760409.75000     515.89752    0.00    1-HR  1         1ST         NA
  364833.65600 3760445.00000     344.22626    0.00    1-HR  1         1ST         NA
  364820.93800 3760371.75000     478.06940    0.00    1-HR  1         1ST         NA
  364830.06300 3760338.00000     519.23309    0.00    1-HR  1         1ST         NA
  364839.21900 3760304.25000     476.93408    0.00    1-HR  1         1ST         NA
  364813.87500 3760406.25000     490.22781    0.00    1-HR  1         1ST         NA
  364808.87500 3760441.50000     352.66324    0.00    1-HR  1         1ST         NA
  364795.75000 3760369.75000     444.97144    0.00    1-HR  1         1ST         NA
  364804.06300 3760339.25000     483.47705    0.00    1-HR  1         1ST         NA
  364812.34400 3760308.50000     413.77429    0.00    1-HR  1         1ST         NA
  364789.12500 3760402.75000     463.36859    0.00    1-HR  1         1ST         NA
  364784.12500 3760438.00000     355.96808    0.00    1-HR  1         1ST         NA
  364771.25000 3760365.50000     424.24933    0.00    1-HR  1         1ST         NA
  364780.00000 3760333.25000     448.40521    0.00    1-HR  1         1ST         NA
  364788.75000 3760300.75000     398.40591    0.00    1-HR  1         1ST         NA
  364764.37500 3760399.25000     436.24341    0.00    1-HR  1         1ST         NA
  364759.37500 3760434.50000     354.98572    0.00    1-HR  1         1ST         NA
  364746.71900 3760361.25000     403.67880    0.00    1-HR  1         1ST         NA
  364755.93800 3760327.00000     414.95929    0.00    1-HR  1         1ST         NA
  364765.15600 3760293.00000     384.94772    0.00    1-HR  1         1ST         NA
  364739.62500 3760395.75000     409.50635    0.00    1-HR  1         1ST         NA
  364734.62500 3760430.75000     351.26883    0.00    1-HR  1         1ST         NA
  365204.62500 3760522.50000    1826.62891    0.00    1-HR  1         1ST         NA
  365179.68800 3760500.75000    1219.25806    0.00    1-HR  1         1ST         NA
  365154.62500 3760522.25000     870.50922    0.00    1-HR  1         1ST         NA
  365129.62500 3760522.25000     929.42285    0.00    1-HR  1         1ST         NA
  365104.62500 3760522.00000    1134.78906    0.00    1-HR  1         1ST         NA
  365079.62500 3760522.00000    1170.47461    0.00    1-HR  1         1ST         NA
  365054.68800 3760500.50000    1124.46375    0.00    1-HR  1         1ST         NA
  365029.68800 3760500.25000     942.60773    0.00    1-HR  1         1ST         NA
  365029.53100 3760543.50000     928.75092    0.00    1-HR  1         1ST         NA
  365004.68800 3760500.25000     751.21423    0.00    1-HR  1         1ST         NA
  364979.68800 3760500.25000     671.62817    0.00    1-HR  1         1ST         NA
  364979.53100 3760543.25000     777.85474    0.00    1-HR  1         1ST         NA
  364954.68800 3760500.00000     677.94324    0.00    1-HR  1         1ST         NA
  364929.68800 3760500.00000     660.93616    0.00    1-HR  1         1ST         NA
  364929.53100 3760543.00000     597.18134    0.00    1-HR  1         1ST         NA
  364905.75000 3760485.00000     646.58282    0.00    1-HR  1         1ST         NA
  364904.62500 3760521.50000     530.43274    0.00    1-HR  1         1ST         NA
  364880.84400 3760483.75000     581.06580    0.00    1-HR  1         1ST         NA
  364879.62500 3760521.25000     529.15411    0.00    1-HR  1         1ST         NA
  364855.93800 3760482.50000     515.27234    0.00    1-HR  1         1ST         NA
  364854.62500 3760521.25000     514.96088    0.00    1-HR  1         1ST         NA
  364831.00000 3760481.50000     453.33698    0.00    1-HR  1         1ST         NA
  364829.62500 3760521.25000     492.62363    0.00    1-HR  1         1ST         NA
  364806.09400 3760480.25000     395.50049    0.00    1-HR  1         1ST         NA
  364804.62500 3760521.00000     465.10971    0.00    1-HR  1         1ST         NA
  364781.18800 3760479.00000     343.34787    0.00    1-HR  1         1ST         NA
  364779.62500 3760521.00000     434.19528    0.00    1-HR  1         1ST         NA
  364755.87500 3760483.00000     315.36331    0.00    1-HR  1         1ST         NA
  364754.62500 3760521.00000     402.03986    0.00    1-HR  1         1ST         NA
  364730.93800 3760482.25000     275.59317    0.00    1-HR  1         1ST         NA
  364729.62500 3760520.75000     369.59738    0.00    1-HR  1         1ST         NA
  365237.15600 3760448.25000    2809.26660    0.00    1-HR  1         1ST         NA
  365250.87500 3760414.75000    4570.22949    0.00    1-HR  1         1ST         NA
  365273.87500 3760369.75000    4318.92041    0.00    1-HR  1         1ST         NA
  365333.75000 3760269.00000    1524.51038    0.00    1-HR  1         1ST         NA
  365372.15600 3760209.50000    1172.06616    0.00    1-HR  1         1ST         NA
  365477.31300 3760208.00000     650.25421    0.00    1-HR  1         1ST         NA
  365477.31300 3760244.75000     835.24280    0.00    1-HR  1         1ST         NA
  365457.78100 3760244.75000     952.16772    0.00    1-HR  1         1ST         NA
  365339.75000 3760430.50000    2338.48145    0.00    1-HR  1         1ST         NA
  365684.93800 3760428.75000     303.53522    0.00    1-HR  1         1ST         NA
  365685.68800 3760473.25000     285.66217    0.00    1-HR  1         1ST         NA
  365435.59400 3760475.00000    1060.57788    0.00    1-HR  1         1ST         NA
  365435.65600 3760543.75000     687.27435    0.00    1-HR  1         1ST         NA
  365229.53100 3760544.00000    1068.36621    0.00    1-HR  1         1ST         NA
  365229.68800 3760501.00000    2098.53271    0.00    1-HR  1         1ST         NA
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* ISCST3 (02035): NEPTUNE MARINA LST (10R – CO)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  8-HR VALUES FOR SOURCE GROUP: 1
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL     NET ID
*  ____________ ____________ ____________ _______ ________ ________ _________ ________
  365926.56300 3760847.25000      35.24367     0.00    8-HR  1          1ST          NA
  365886.96900 3760864.25000      38.13354     0.00    8-HR  1          1ST          NA
  365847.37500 3760881.00000      38.87831     0.00    8-HR  1          1ST          NA
  365807.78100 3760897.75000      44.14227     0.00    8-HR  1          1ST          NA
  366160.25000 3760443.00000      10.57856     0.00    8-HR  1          1ST          NA
  366177.71900 3760484.75000      12.41392     0.00    8-HR  1          1ST          NA
  366161.90600 3760524.50000      15.62597     0.00    8-HR  1          1ST          NA
  366146.12500 3760564.25000      17.90668     0.00    8-HR  1          1ST          NA
  366130.31300 3760604.00000      18.91266     0.00    8-HR  1          1ST          NA
  366114.53100 3760643.75000      18.79452     0.00    8-HR  1          1ST          NA
  366098.71900 3760683.50000      19.80833     0.00    8-HR  1          1ST          NA
  366082.90600 3760723.25000      22.96162     0.00    8-HR  1          1ST          NA
  366067.12500 3760763.00000      26.28472     0.00    8-HR  1          1ST          NA
  366051.31300 3760802.75000      28.50894     0.00    8-HR  1          1ST          NA
  366023.71900 3760831.00000      29.57804     0.00    8-HR  1          1ST          NA
  365984.37500 3760847.75000      29.56383     0.00    8-HR  1          1ST          NA
  365945.00000 3760864.50000      33.33132     0.00    8-HR  1          1ST          NA
  365905.65600 3760881.25000      35.88133     0.00    8-HR  1          1ST          NA
  365866.28100 3760898.00000      36.53273     0.00    8-HR  1          1ST          NA
  365826.93800 3760914.75000      41.34517     0.00    8-HR  1          1ST          NA
  365787.56300 3760931.50000      43.09368     0.00    8-HR  1          1ST          NA
  365748.21900 3760948.25000      40.49119     0.00    8-HR  1          1ST          NA
  366185.25000 3760442.75000      10.02386     0.00    8-HR  1          1ST          NA
  366184.87500 3760420.25000       9.88877     0.00    8-HR  1          1ST          NA
  365684.81300 3760403.75000      51.83984     0.00    8-HR  1          1ST          NA
  365660.15600 3760403.75000      61.63687     0.00    8-HR  1          1ST          NA
  365635.50000 3760404.00000      74.44418     0.00    8-HR  1          1ST          NA
  365610.84400 3760404.00000      90.83018     0.00    8-HR  1          1ST          NA
  365586.18800 3760404.25000     112.91996     0.00    8-HR  1          1ST          NA
  365561.53100 3760404.25000     142.37250     0.00    8-HR  1          1ST          NA
  365536.87500 3760404.50000     183.63284     0.00    8-HR  1          1ST          NA
  365512.21900 3760404.50000     241.54184     0.00    8-HR  1          1ST          NA
  365487.56300 3760404.75000     329.91873     0.00    8-HR  1          1ST          NA
  365462.90600 3760404.75000     495.15530     0.00    8-HR  1          1ST          NA
  365438.25000 3760405.00000     753.33075     0.00    8-HR  1          1ST          NA
  365413.59400 3760405.00000    1116.18005     0.00    8-HR  1          1ST          NA
  365388.93800 3760405.25000    1571.35938     0.00    8-HR  1          1ST          NA
  365364.28100 3760405.25000    2316.15576     0.00    8-HR  1          1ST          NA
  365702.31300 3760385.75000      44.69850     0.00    8-HR  1          1ST          NA
  365660.03100 3760378.75000      55.10277     0.00    8-HR  1          1ST          NA
  365635.37500 3760379.00000      63.94729     0.00    8-HR  1          1ST          NA
  365610.71900 3760379.00000      75.07267     0.00    8-HR  1          1ST          NA
  365586.06300 3760379.25000      89.48114     0.00    8-HR  1          1ST          NA
  365561.40600 3760379.25000     108.42971     0.00    8-HR  1          1ST          NA
  365536.75000 3760379.50000     134.22406     0.00    8-HR  1          1ST          NA
  365512.09400 3760379.50000     170.40648     0.00    8-HR  1          1ST          NA
  365487.43800 3760379.75000     225.52846     0.00    8-HR  1          1ST          NA
  365462.78100 3760379.75000     332.03329     0.00    8-HR  1          1ST          NA
  365438.12500 3760380.00000     550.93640     0.00    8-HR  1          1ST          NA
  365413.46900 3760380.00000     996.08569     0.00    8-HR  1          1ST          NA
  365388.81300 3760380.25000    1650.71741     0.00    8-HR  1          1ST          NA
  365702.18800 3760360.75000      41.03546     0.00    8-HR  1          1ST          NA
  365744.90600 3760392.50000      36.95529     0.00    8-HR  1          1ST          NA
  365659.90600 3760353.75000      54.95913     0.00    8-HR  1          1ST          NA
  365635.25000 3760354.00000      64.20445     0.00    8-HR  1          1ST          NA
  365610.59400 3760354.00000      76.03219     0.00    8-HR  1          1ST          NA
  365585.93800 3760354.25000      91.15808     0.00    8-HR  1          1ST          NA
  365561.28100 3760354.25000     111.25553     0.00    8-HR  1          1ST          NA
  365536.62500 3760354.50000     138.21324     0.00    8-HR  1          1ST          NA
  365511.96900 3760354.50000     175.95058     0.00    8-HR  1          1ST          NA
  365487.31300 3760354.75000     230.25090     0.00    8-HR  1          1ST          NA
  365462.65600 3760354.75000     312.84250     0.00    8-HR  1          1ST          NA
  365438.00000 3760355.00000     447.28210     0.00    8-HR  1          1ST          NA
  365413.34400 3760355.00000     704.77496     0.00    8-HR  1          1ST          NA
  365388.68800 3760355.25000    1371.95044     0.00    8-HR  1          1ST          NA
  365702.06300 3760335.75000      47.27759     0.00    8-HR  1          1ST          NA
  365737.28100 3760350.00000      36.55563     0.00    8-HR  1          1ST          NA
  365762.37500 3760374.75000      32.47125     0.00    8-HR  1          1ST          NA
  365777.40600 3760409.50000      32.73713     0.00    8-HR  1          1ST          NA
  365659.78100 3760328.75000      61.36956     0.00    8-HR  1          1ST          NA
  365635.12500 3760329.00000      71.15560     0.00    8-HR  1          1ST          NA
  365610.46900 3760329.00000      83.25289     0.00    8-HR  1          1ST          NA
```

```
* ISCST3 (02035): NEPTUNE MARINA LST (10R – NOx)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  1-HR VALUES FOR SOURCE GROUP: 1
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ___________  ___________  ___________  _______  _______  ________  ________  ________
  364863.37500 3760413.25000     389.85690     0.00    1-HR  1         1ST         NA
  364858.40600 3760448.50000     254.35080     0.00    1-HR  1         1ST         NA
  364845.40600 3760376.25000     383.12305     0.00    1-HR  1         1ST         NA
  364854.03100 3760344.50000     407.10529     0.00    1-HR  1         1ST         NA
  364862.62500 3760312.75000     356.60809     0.00    1-HR  1         1ST         NA
  364838.62500 3760409.75000     373.06641     0.00    1-HR  1         1ST         NA
  364833.65600 3760445.00000     248.92395     0.00    1-HR  1         1ST         NA
  364820.93800 3760371.75000     345.71136     0.00    1-HR  1         1ST         NA
  364830.06300 3760338.00000     375.47852     0.00    1-HR  1         1ST         NA
  364839.21900 3760304.25000     344.89035     0.00    1-HR  1         1ST         NA
  364813.87500 3760406.25000     354.50357     0.00    1-HR  1         1ST         NA
  364808.87500 3760441.50000     255.02509     0.00    1-HR  1         1ST         NA
  364795.75000 3760369.75000     321.77682     0.00    1-HR  1         1ST         NA
  364804.06300 3760339.25000     349.62183     0.00    1-HR  1         1ST         NA
  364812.34400 3760308.50000     299.21695     0.00    1-HR  1         1ST         NA
  364789.12500 3760402.75000     335.08054     0.00    1-HR  1         1ST         NA
  364784.12500 3760438.00000     257.41492     0.00    1-HR  1         1ST         NA
  364771.25000 3760365.50000     306.79187     0.00    1-HR  1         1ST         NA
  364780.00000 3760333.25000     324.26004     0.00    1-HR  1         1ST         NA
  364788.75000 3760300.75000     288.10349     0.00    1-HR  1         1ST         NA
  364764.37500 3760399.25000     315.46530     0.00    1-HR  1         1ST         NA
  364759.37500 3760434.50000     256.70453     0.00    1-HR  1         1ST         NA
  364746.71900 3760361.25000     291.91650     0.00    1-HR  1         1ST         NA
  364755.93800 3760327.00000     300.07388     0.00    1-HR  1         1ST         NA
  364765.15600 3760293.00000     278.37128     0.00    1-HR  1         1ST         NA
  364739.62500 3760395.75000     296.13062     0.00    1-HR  1         1ST         NA
  364734.62500 3760430.75000     254.01671     0.00    1-HR  1         1ST         NA
  365204.62500 3760522.50000    1320.90955     0.00    1-HR  1         1ST         NA
  365179.68800 3760500.75000     881.69489     0.00    1-HR  1         1ST         NA
  365154.62500 3760522.25000     629.50043     0.00    1-HR  1         1ST         NA
  365129.62500 3760522.25000     672.10327     0.00    1-HR  1         1ST         NA
  365104.62500 3760522.00000     820.61200     0.00    1-HR  1         1ST         NA
  365079.62500 3760522.00000     846.41754     0.00    1-HR  1         1ST         NA
  365054.68800 3760500.50000     813.14520     0.00    1-HR  1         1ST         NA
  365029.68800 3760500.25000     681.63788     0.00    1-HR  1         1ST         NA
  365029.53100 3760543.50000     671.61731     0.00    1-HR  1         1ST         NA
  365004.68800 3760500.25000     543.23346     0.00    1-HR  1         1ST         NA
  364979.68800 3760500.25000     485.68149     0.00    1-HR  1         1ST         NA
  364979.53100 3760543.25000     562.49829     0.00    1-HR  1         1ST         NA
  364954.68800 3760500.00000     490.24820     0.00    1-HR  1         1ST         NA
  364929.68800 3760500.00000     477.94968     0.00    1-HR  1         1ST         NA
  364929.53100 3760543.00000     431.84598     0.00    1-HR  1         1ST         NA
  364905.75000 3760485.00000     467.57016     0.00    1-HR  1         1ST         NA
  364904.62500 3760521.50000     383.57736     0.00    1-HR  1         1ST         NA
  364880.84400 3760483.75000     420.19226     0.00    1-HR  1         1ST         NA
  364879.62500 3760521.25000     382.65274     0.00    1-HR  1         1ST         NA
  364855.93800 3760482.50000     372.61429     0.00    1-HR  1         1ST         NA
  364854.62500 3760521.25000     372.38910     0.00    1-HR  1         1ST         NA
  364831.00000 3760481.50000     327.82626     0.00    1-HR  1         1ST         NA
  364829.62500 3760521.25000     356.23605     0.00    1-HR  1         1ST         NA
  364806.09400 3760480.25000     286.00244     0.00    1-HR  1         1ST         NA
  364804.62500 3760521.00000     336.33966     0.00    1-HR  1         1ST         NA
  364781.18800 3760479.00000     248.28876     0.00    1-HR  1         1ST         NA
  364779.62500 3760521.00000     313.98419     0.00    1-HR  1         1ST         NA
  364755.87500 3760483.00000     228.05199     0.00    1-HR  1         1ST         NA
  364754.62500 3760521.00000     290.73129     0.00    1-HR  1         1ST         NA
  364730.93800 3760482.25000     199.29257     0.00    1-HR  1         1ST         NA
  364729.62500 3760520.75000     267.27084     0.00    1-HR  1         1ST         NA
  365237.15600 3760448.25000    2031.49426     0.00    1-HR  1         1ST         NA
  365250.87500 3760414.75000    3304.91772     0.00    1-HR  1         1ST         NA
  365273.87500 3760369.75000    3123.18628     0.00    1-HR  1         1ST         NA
  365333.75000 3760269.00000    1102.43518     0.00    1-HR  1         1ST         NA
  365372.15600 3760209.50000     847.56848     0.00    1-HR  1         1ST         NA
  365477.31300 3760208.00000     470.22516     0.00    1-HR  1         1ST         NA
  365477.31300 3760244.75000     603.99786     0.00    1-HR  1         1ST         NA
  365457.78100 3760244.75000     688.55103     0.00    1-HR  1         1ST         NA
  365339.75000 3760430.50000    1691.05066     0.00    1-HR  1         1ST         NA
  365684.93800 3760428.75000     219.49860     0.00    1-HR  1         1ST         NA
  365685.68800 3760473.25000     206.57388     0.00    1-HR  1         1ST         NA
  365435.59400 3760475.00000     766.94684     0.00    1-HR  1         1ST         NA
  365435.65600 3760543.75000     496.99588     0.00    1-HR  1         1ST         NA
  365229.53100 3760544.00000     772.57880     0.00    1-HR  1         1ST         NA
  365229.68800 3760501.00000    1517.53394     0.00    1-HR  1         1ST         NA
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* ISCST3 (02035): NEPTUNE MARINA LST (10R – PM10)
* MODELING OPTIONS USED:
*  CONC        DDEP        URBAN FLAT  FLGPOL TOXICS                      NOCALM                ARDPLT
*         PLOT FILE OF  HIGH 1ST  HIGH 24-HR VALUES FOR SOURCE GROUP: 3
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (4(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC      DRY DEPO   ZELEV     AVE     GRP       HIVAL    NET ID
*
```

X	Y	AVERAGE CONC	DRY DEPO	ZELEV	AVE	GRP	HIVAL	NET ID
364863.37500	3760413.25000	3.78163	0.00486	0.00	24-HR	3	1ST	NA
364858.40600	3760448.50000	3.81145	0.00481	0.00	24-HR	3	1ST	NA
364845.40600	3760376.25000	3.39437	0.00403	0.00	24-HR	3	1ST	NA
364854.03100	3760344.50000	3.07358	0.00335	0.00	24-HR	3	1ST	NA
364862.62500	3760312.75000	3.05646	0.00252	0.00	24-HR	3	1ST	NA
364838.62500	3760409.75000	3.53507	0.00445	0.00	24-HR	3	1ST	NA
364833.65600	3760445.00000	3.52812	0.00445	0.00	24-HR	3	1ST	NA
364820.93800	3760371.75000	3.14461	0.00367	0.00	24-HR	3	1ST	NA
364830.06300	3760338.00000	2.90249	0.00301	0.00	24-HR	3	1ST	NA
364839.21900	3760304.25000	2.83699	0.00222	0.00	24-HR	3	1ST	NA
364813.87500	3760406.25000	3.31675	0.00407	0.00	24-HR	3	1ST	NA
364808.87500	3760441.50000	3.27388	0.00412	0.00	24-HR	3	1ST	NA
364795.75000	3760369.75000	2.94945	0.00338	0.00	24-HR	3	1ST	NA
364804.06300	3760339.25000	2.66636	0.00287	0.00	24-HR	3	1ST	NA
364812.34400	3760308.50000	2.75460	0.00224	0.00	24-HR	3	1ST	NA
364789.12500	3760402.75000	3.11361	0.00374	0.00	24-HR	3	1ST	NA
364784.12500	3760438.00000	3.03833	0.00382	0.00	24-HR	3	1ST	NA
364771.25000	3760365.50000	2.74578	0.00311	0.00	24-HR	3	1ST	NA
364780.00000	3760333.25000	2.52650	0.00260	0.00	24-HR	3	1ST	NA
364788.75000	3760300.75000	2.58029	0.00201	0.00	24-HR	3	1ST	NA
364764.37500	3760399.25000	2.92877	0.00345	0.00	24-HR	3	1ST	NA
364759.37500	3760434.50000	2.82014	0.00354	0.00	24-HR	3	1ST	NA
364746.71900	3760361.25000	2.56014	0.00286	0.00	24-HR	3	1ST	NA
364755.93800	3760327.00000	2.39812	0.00237	0.00	24-HR	3	1ST	NA
364765.15600	3760293.00000	2.41770	0.00181	0.00	24-HR	3	1ST	NA
364739.62500	3760395.75000	2.75912	0.00318	0.00	24-HR	3	1ST	NA
364734.62500	3760430.75000	2.61731	0.00329	0.00	24-HR	3	1ST	NA
365204.62500	3760522.50000	13.87575	0.01657	0.00	24-HR	3	1ST	NA
365179.68800	3760500.75000	17.95048	0.01858	0.00	24-HR	3	1ST	NA
365154.62500	3760522.25000	12.92626	0.01370	0.00	24-HR	3	1ST	NA
365129.62500	3760522.25000	12.29586	0.01274	0.00	24-HR	3	1ST	NA
365104.62500	3760522.00000	11.35432	0.01151	0.00	24-HR	3	1ST	NA
365079.62500	3760522.00000	10.32235	0.01024	0.00	24-HR	3	1ST	NA
365054.68800	3760500.50000	9.45623	0.01005	0.00	24-HR	3	1ST	NA
365029.68800	3760500.25000	8.31794	0.00899	0.00	24-HR	3	1ST	NA
365029.53100	3760543.50000	7.72511	0.00773	0.00	24-HR	3	1ST	NA
365004.68800	3760500.25000	7.35944	0.00805	0.00	24-HR	3	1ST	NA
364979.68800	3760500.25000	6.52098	0.00723	0.00	24-HR	3	1ST	NA
364979.53100	3760543.25000	6.69114	0.00627	0.00	24-HR	3	1ST	NA
364954.68800	3760500.00000	5.78742	0.00647	0.00	24-HR	3	1ST	NA
364929.68800	3760500.00000	5.14280	0.00578	0.00	24-HR	3	1ST	NA
364929.53100	3760543.00000	5.69386	0.00534	0.00	24-HR	3	1ST	NA
364905.75000	3760485.00000	4.45656	0.00513	0.00	24-HR	3	1ST	NA
364904.62500	3760521.50000	5.03647	0.00521	0.00	24-HR	3	1ST	NA
364880.84400	3760483.75000	4.02176	0.00462	0.00	24-HR	3	1ST	NA
364879.62500	3760521.25000	4.54659	0.00476	0.00	24-HR	3	1ST	NA
364855.93800	3760482.50000	3.64255	0.00431	0.00	24-HR	3	1ST	NA
364854.62500	3760521.25000	4.10492	0.00436	0.00	24-HR	3	1ST	NA
364831.00000	3760481.50000	3.34978	0.00401	0.00	24-HR	3	1ST	NA
364829.62500	3760521.25000	3.70621	0.00400	0.00	24-HR	3	1ST	NA
364806.09400	3760480.25000	3.16509	0.00375	0.00	24-HR	3	1ST	NA
364804.62500	3760521.00000	3.34604	0.00368	0.00	24-HR	3	1ST	NA
364781.18800	3760479.00000	2.99302	0.00351	0.00	24-HR	3	1ST	NA
364779.62500	3760521.00000	3.02650	0.00340	0.00	24-HR	3	1ST	NA
364755.87500	3760483.00000	2.78146	0.00323	0.00	24-HR	3	1ST	NA
364754.62500	3760521.00000	2.74021	0.00314	0.00	24-HR	3	1ST	NA
364730.93800	3760482.25000	2.63837	0.00303	0.00	24-HR	3	1ST	NA
364729.62500	3760520.75000	2.51188	0.00291	0.00	24-HR	3	1ST	NA
365237.15600	3760448.25000	59.07581	0.07770	0.00	24-HR	3	1ST	NA
365250.87500	3760414.75000	54.86435	0.07271	0.00	24-HR	3	1ST	NA
365273.87500	3760369.75000	46.57106	0.06471	0.00	24-HR	3	1ST	NA
365333.75000	3760269.00000	7.76567	0.01605	0.00	24-HR	3	1ST	NA
365372.15600	3760209.50000	4.07429	0.01025	0.00	24-HR	3	1ST	NA
365477.31300	3760208.00000	2.94689	0.00732	0.00	24-HR	3	1ST	NA
365477.31300	3760244.75000	3.52694	0.00775	0.00	24-HR	3	1ST	NA
365457.78100	3760244.75000	3.69041	0.00911	0.00	24-HR	3	1ST	NA
365339.75000	3760430.50000	59.35270	0.08493	0.00	24-HR	3	1ST	NA
365684.93800	3760428.75000	20.09937	0.06700	0.00	24-HR	3	1ST	NA
365685.68800	3760473.25000	50.89553	0.06649	0.00	24-HR	3	1ST	NA
365435.59400	3760475.00000	71.78912	0.08876	0.00	24-HR	3	1ST	NA
365435.65600	3760543.75000	19.96693	0.02007	0.00	24-HR	3	1ST	NA
365229.53100	3760544.00000	11.71964	0.01310	0.00	24-HR	3	1ST	NA
365229.68800	3760501.00000	20.33796	0.02709	0.00	24-HR	3	1ST	NA

```
* ISCST3 (02035): NEPTUNE MARINA LST (FF – CO)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  1-HR VALUES FOR SOURCE GROUP: 1
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ____________  ____________  ____________  _______  _______  ________  ________  ________
  364863.37500 3760413.25000     473.69171     0.00    1-HR  1         1ST          NA
  364858.40600 3760448.50000     552.53021     0.00    1-HR  1         1ST          NA
  364845.40600 3760376.25000     255.14268     0.00    1-HR  1         1ST          NA
  364854.03100 3760344.50000     309.01044     0.00    1-HR  1         1ST          NA
  364862.62500 3760312.75000     450.07919     0.00    1-HR  1         1ST          NA
  364838.62500 3760409.75000     446.41879     0.00    1-HR  1         1ST          NA
  364833.65600 3760445.00000     504.64349     0.00    1-HR  1         1ST          NA
  364820.93800 3760371.75000     250.18472     0.00    1-HR  1         1ST          NA
  364830.06300 3760338.00000     265.87030     0.00    1-HR  1         1ST          NA
  364839.21900 3760304.25000     407.52194     0.00    1-HR  1         1ST          NA
  364813.87500 3760406.25000     420.66486     0.00    1-HR  1         1ST          NA
  364808.87500 3760441.50000     462.96381     0.00    1-HR  1         1ST          NA
  364795.75000 3760369.75000     256.46329     0.00    1-HR  1         1ST          NA
  364804.06300 3760339.25000     195.62759     0.00    1-HR  1         1ST          NA
  364812.34400 3760308.50000     327.82324     0.00    1-HR  1         1ST          NA
  364789.12500 3760402.75000     396.52606     0.00    1-HR  1         1ST          NA
  364784.12500 3760438.00000     426.56256     0.00    1-HR  1         1ST          NA
  364771.25000 3760365.50000     249.95555     0.00    1-HR  1         1ST          NA
  364780.00000 3760333.25000     167.49277     0.00    1-HR  1         1ST          NA
  364788.75000 3760300.75000     293.76257     0.00    1-HR  1         1ST          NA
  364764.37500 3760399.25000     374.01385     0.00    1-HR  1         1ST          NA
  364759.37500 3760434.50000     394.53842     0.00    1-HR  1         1ST          NA
  364746.71900 3760361.25000     243.04800     0.00    1-HR  1         1ST          NA
  364755.93800 3760327.00000     144.81418     0.00    1-HR  1         1ST          NA
  364765.15600 3760293.00000     264.03564     0.00    1-HR  1         1ST          NA
  364739.62500 3760395.75000     353.08685     0.00    1-HR  1         1ST          NA
  364734.62500 3760430.75000     366.52789     0.00    1-HR  1         1ST          NA
  365204.62500 3760522.50000    4499.96680     0.00    1-HR  1         1ST          NA
  365179.68800 3760500.75000    3723.71899     0.00    1-HR  1         1ST          NA
  365154.62500 3760522.25000    3061.59375     0.00    1-HR  1         1ST          NA
  365129.62500 3760522.25000    2468.31128     0.00    1-HR  1         1ST          NA
  365104.62500 3760522.00000    2011.19666     0.00    1-HR  1         1ST          NA
  365079.62500 3760522.00000    1670.01550     0.00    1-HR  1         1ST          NA
  365054.68800 3760500.50000    1404.06030     0.00    1-HR  1         1ST          NA
  365029.68800 3760500.25000    1225.83582     0.00    1-HR  1         1ST          NA
  365029.53100 3760543.50000    1195.31909     0.00    1-HR  1         1ST          NA
  365004.68800 3760500.25000    1079.00879     0.00    1-HR  1         1ST          NA
  364979.68800 3760500.25000     955.38397     0.00    1-HR  1         1ST          NA
  364979.53100 3760543.25000     939.51703     0.00    1-HR  1         1ST          NA
  364954.68800 3760500.00000     850.40234     0.00    1-HR  1         1ST          NA
  364929.68800 3760500.00000     762.09967     0.00    1-HR  1         1ST          NA
  364929.53100 3760543.00000     755.21948     0.00    1-HR  1         1ST          NA
  364905.75000 3760485.00000     642.98419     0.00    1-HR  1         1ST          NA
  364904.62500 3760521.50000     642.90631     0.00    1-HR  1         1ST          NA
  364880.84400 3760483.75000     587.03308     0.00    1-HR  1         1ST          NA
  364879.62500 3760521.25000     580.93573     0.00    1-HR  1         1ST          NA
  364855.93800 3760482.50000     538.38489     0.00    1-HR  1         1ST          NA
  364854.62500 3760521.25000     527.68982     0.00    1-HR  1         1ST          NA
  364831.00000 3760481.50000     496.55762     0.00    1-HR  1         1ST          NA
  364829.62500 3760521.25000     482.25552     0.00    1-HR  1         1ST          NA
  364806.09400 3760480.25000     459.03036     0.00    1-HR  1         1ST          NA
  364804.62500 3760521.00000     443.07330     0.00    1-HR  1         1ST          NA
  364781.18800 3760479.00000     425.87088     0.00    1-HR  1         1ST          NA
  364779.62500 3760521.00000     408.38812     0.00    1-HR  1         1ST          NA
  364755.87500 3760483.00000     403.92551     0.00    1-HR  1         1ST          NA
  364754.62500 3760521.00000     378.00229     0.00    1-HR  1         1ST          NA
  364730.93800 3760482.25000     376.99734     0.00    1-HR  1         1ST          NA
  364729.62500 3760520.75000     351.61972     0.00    1-HR  1         1ST          NA
  365237.15600 3760448.25000    1416.76013     0.00    1-HR  1         1ST          NA
  365250.87500 3760414.75000    1068.01770     0.00    1-HR  1         1ST          NA
  365273.87500 3760369.75000     804.44849     0.00    1-HR  1         1ST          NA
  365333.75000 3760269.00000     400.85260     0.00    1-HR  1         1ST          NA
  365372.15600 3760209.50000     268.54163     0.00    1-HR  1         1ST          NA
  365477.31300 3760208.00000     557.70544     0.00    1-HR  1         1ST          NA
  365477.31300 3760244.75000     489.85645     0.00    1-HR  1         1ST          NA
  365457.78100 3760244.75000     646.72192     0.00    1-HR  1         1ST          NA
  365339.75000 3760430.50000    2066.18018     0.00    1-HR  1         1ST          NA
  365684.93800 3760428.75000     203.97397     0.00    1-HR  1         1ST          NA
  365685.68800 3760473.25000     208.96613     0.00    1-HR  1         1ST          NA
  365435.59400 3760475.00000    1059.57568     0.00    1-HR  1         1ST          NA
  365435.65600 3760543.75000    1168.75305     0.00    1-HR  1         1ST          NA
  365229.53100 3760544.00000    4647.39893     0.00    1-HR  1         1ST          NA
  365229.68800 3760501.00000    4290.61182     0.00    1-HR  1         1ST          NA
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* ISCST3 (02035): NEPTUNE MARINA LST (FF – CO)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  8-HR VALUES FOR SOURCE GROUP: 2
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ___________  ___________  ___________  _______  _______  ________  _________  ________
  364863.37500 3760413.25000      50.07579     0.00    8-HR  2          1ST          NA
  364858.40600 3760448.50000      45.51431     0.00    8-HR  2          1ST          NA
  364845.40600 3760376.25000      37.25027     0.00    8-HR  2          1ST          NA
  364854.03100 3760344.50000      28.49540     0.00    8-HR  2          1ST          NA
  364862.62500 3760312.75000      32.88287     0.00    8-HR  2          1ST          NA
  364838.62500 3760409.75000      46.80596     0.00    8-HR  2          1ST          NA
  364833.65600 3760445.00000      42.27644     0.00    8-HR  2          1ST          NA
  364820.93800 3760371.75000      35.49254     0.00    8-HR  2          1ST          NA
  364830.06300 3760338.00000      25.98922     0.00    8-HR  2          1ST          NA
  364839.21900 3760304.25000      30.25317     0.00    8-HR  2          1ST          NA
  364813.87500 3760406.25000      43.84835     0.00    8-HR  2          1ST          NA
  364808.87500 3760441.50000      39.39561     0.00    8-HR  2          1ST          NA
  364795.75000 3760369.75000      34.66870     0.00    8-HR  2          1ST          NA
  364804.06300 3760339.25000      23.12722     0.00    8-HR  2          1ST          NA
  364812.34400 3760308.50000      26.65702     0.00    8-HR  2          1ST          NA
  364789.12500 3760402.75000      41.16693     0.00    8-HR  2          1ST          NA
  364784.12500 3760438.00000      36.82851     0.00    8-HR  2          1ST          NA
  364771.25000 3760365.50000      33.10107     0.00    8-HR  2          1ST          NA
  364780.00000 3760333.25000      22.11172     0.00    8-HR  2          1ST          NA
  364788.75000 3760300.75000      24.62623     0.00    8-HR  2          1ST          NA
  364764.37500 3760399.25000      38.73009     0.00    8-HR  2          1ST          NA
  364759.37500 3760434.50000      34.52624     0.00    8-HR  2          1ST          NA
  364746.71900 3760361.25000      31.62823     0.00    8-HR  2          1ST          NA
  364755.93800 3760327.00000      21.08095     0.00    8-HR  2          1ST          NA
  364765.15600 3760293.00000      22.82001     0.00    8-HR  2          1ST          NA
  364739.62500 3760395.75000      36.51020     0.00    8-HR  2          1ST          NA
  364734.62500 3760430.75000      32.50700     0.00    8-HR  2          1ST          NA
  365204.62500 3760522.50000     333.81546     0.00    8-HR  2          1ST          NA
  365179.68800 3760500.75000     250.11516     0.00    8-HR  2          1ST          NA
  365154.62500 3760522.25000     219.08325     0.00    8-HR  2          1ST          NA
  365129.62500 3760522.25000     185.63326     0.00    8-HR  2          1ST          NA
  365104.62500 3760522.00000     159.19493     0.00    8-HR  2          1ST          NA
  365079.62500 3760522.00000     138.49304     0.00    8-HR  2          1ST          NA
  365054.68800 3760500.50000     124.21780     0.00    8-HR  2          1ST          NA
  365029.68800 3760500.25000     110.58460     0.00    8-HR  2          1ST          NA
  365029.53100 3760543.50000     112.98888     0.00    8-HR  2          1ST          NA
  365004.68800 3760500.25000      99.13186     0.00    8-HR  2          1ST          NA
  364979.68800 3760500.25000      89.38889     0.00    8-HR  2          1ST          NA
  364979.53100 3760543.25000      91.83602     0.00    8-HR  2          1ST          NA
  364954.68800 3760500.00000      81.05302     0.00    8-HR  2          1ST          NA
  364929.68800 3760500.00000      73.85500     0.00    8-HR  2          1ST          NA
  364929.53100 3760543.00000      76.24747     0.00    8-HR  2          1ST          NA
  364905.75000 3760485.00000      66.87311     0.00    8-HR  2          1ST          NA
  364904.62500 3760521.50000      65.58382     0.00    8-HR  2          1ST          NA
  364880.84400 3760483.75000      61.71185     0.00    8-HR  2          1ST          NA
  364879.62500 3760521.25000      60.25632     0.00    8-HR  2          1ST          NA
  364855.93800 3760482.50000      57.16819     0.00    8-HR  2          1ST          NA
  364854.62500 3760521.25000      55.67929     0.00    8-HR  2          1ST          NA
  364831.00000 3760481.50000      53.17465     0.00    8-HR  2          1ST          NA
  364829.62500 3760521.25000      51.64359     0.00    8-HR  2          1ST          NA
  364806.09400 3760480.25000      49.59147     0.00    8-HR  2          1ST          NA
  364804.62500 3760521.00000      47.99687     0.00    8-HR  2          1ST          NA
  364781.18800 3760479.00000      46.38847     0.00    8-HR  2          1ST          NA
  364779.62500 3760521.00000      44.81429     0.00    8-HR  2          1ST          NA
  364755.87500 3760483.00000      43.78209     0.00    8-HR  2          1ST          NA
  364754.62500 3760521.00000      41.96439     0.00    8-HR  2          1ST          NA
  364730.93800 3760482.25000      41.16129     0.00    8-HR  2          1ST          NA
  364729.62500 3760520.75000      39.34906     0.00    8-HR  2          1ST          NA
  365237.15600 3760448.25000     306.62326     0.00    8-HR  2          1ST          NA
  365250.87500 3760414.75000     154.01474     0.00    8-HR  2          1ST          NA
  365273.87500 3760369.75000      77.09329     0.00    8-HR  2          1ST          NA
  365333.75000 3760269.00000      58.35909     0.00    8-HR  2          1ST          NA
  365372.15600 3760209.50000      56.35120     0.00    8-HR  2          1ST          NA
  365477.31300 3760208.00000      38.70030     0.00    8-HR  2          1ST          NA
  365477.31300 3760244.75000      58.84301     0.00    8-HR  2          1ST          NA
  365457.78100 3760244.75000      46.02392     0.00    8-HR  2          1ST          NA
  365339.75000 3760430.50000     185.29131     0.00    8-HR  2          1ST          NA
  365684.93800 3760428.75000      45.88923     0.00    8-HR  2          1ST          NA
  365685.68800 3760473.25000      63.17511     0.00    8-HR  2          1ST          NA
  365435.59400 3760475.00000     473.33130     0.00    8-HR  2          1ST          NA
  365435.65600 3760543.75000    2455.91382     0.00    8-HR  2          1ST          NA
  365229.53100 3760544.00000     524.24432     0.00    8-HR  2          1ST          NA
  365229.68800 3760501.00000     356.10019     0.00    8-HR  2          1ST          NA
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* ISCST3 (02035): NEPTUNE MARINA LST (FF – NOx)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  1-HR VALUES FOR SOURCE GROUP: 1
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ___________  ___________  ___________  ______  ______  ________  ________  ________
  364863.37500 3760413.25000     355.76013     0.00    1-HR  1         1ST         NA
  364858.40600 3760448.50000     414.97079     0.00    1-HR  1         1ST         NA
  364845.40600 3760376.25000     191.62170     0.00    1-HR  1         1ST         NA
  364854.03100 3760344.50000     232.07835     0.00    1-HR  1         1ST         NA
  364862.62500 3760312.75000     338.02628     0.00    1-HR  1         1ST         NA
  364838.62500 3760409.75000     335.27722     0.00    1-HR  1         1ST         NA
  364833.65600 3760445.00000     379.00613     0.00    1-HR  1         1ST         NA
  364820.93800 3760371.75000     187.89809     0.00    1-HR  1         1ST         NA
  364830.06300 3760338.00000     199.67851     0.00    1-HR  1         1ST         NA
  364839.21900 3760304.25000     306.06421     0.00    1-HR  1         1ST         NA
  364813.87500 3760406.25000     315.93500     0.00    1-HR  1         1ST         NA
  364808.87500 3760441.50000     347.70309     0.00    1-HR  1         1ST         NA
  364795.75000 3760369.75000     192.61353     0.00    1-HR  1         1ST         NA
  364804.06300 3760339.25000     146.92363     0.00    1-HR  1         1ST         NA
  364812.34400 3760308.50000     246.20749     0.00    1-HR  1         1ST         NA
  364789.12500 3760402.75000     297.80585     0.00    1-HR  1         1ST         NA
  364784.12500 3760438.00000     320.36438     0.00    1-HR  1         1ST         NA
  364771.25000 3760365.50000     187.72595     0.00    1-HR  1         1ST         NA
  364780.00000 3760333.25000     125.79332     0.00    1-HR  1         1ST         NA
  364788.75000 3760300.75000     220.62668     0.00    1-HR  1         1ST         NA
  364764.37500 3760399.25000     280.89835     0.00    1-HR  1         1ST         NA
  364759.37500 3760434.50000     296.31308     0.00    1-HR  1         1ST         NA
  364746.71900 3760361.25000     182.53812     0.00    1-HR  1         1ST         NA
  364755.93800 3760327.00000     108.76086     0.00    1-HR  1         1ST         NA
  364765.15600 3760293.00000     198.30063     0.00    1-HR  1         1ST         NA
  364739.62500 3760395.75000     265.18143     0.00    1-HR  1         1ST         NA
  364734.62500 3760430.75000     275.27612     0.00    1-HR  1         1ST         NA
  365204.62500 3760522.50000    3379.64307     0.00    1-HR  1         1ST         NA
  365179.68800 3760500.75000    2796.65186     0.00    1-HR  1         1ST         NA
  365154.62500 3760522.25000    2299.37134     0.00    1-HR  1         1ST         NA
  365129.62500 3760522.25000    1853.79407     0.00    1-HR  1         1ST         NA
  365104.62500 3760522.00000    1510.48389     0.00    1-HR  1         1ST         NA
  365079.62500 3760522.00000    1254.24390     0.00    1-HR  1         1ST         NA
  365054.68800 3760500.50000    1054.50171     0.00    1-HR  1         1ST         NA
  365029.68800 3760500.25000     920.64850     0.00    1-HR  1         1ST         NA
  365029.53100 3760543.50000     897.72931     0.00    1-HR  1         1ST         NA
  365004.68800 3760500.25000     810.37592     0.00    1-HR  1         1ST         NA
  364979.68800 3760500.25000     717.52911     0.00    1-HR  1         1ST         NA
  364979.53100 3760543.25000     705.61230     0.00    1-HR  1         1ST         NA
  364954.68800 3760500.00000     638.68396     0.00    1-HR  1         1ST         NA
  364929.68800 3760500.00000     572.36530     0.00    1-HR  1         1ST         NA
  364929.53100 3760543.00000     567.19806     0.00    1-HR  1         1ST         NA
  364905.75000 3760485.00000     482.90515     0.00    1-HR  1         1ST         NA
  364904.62500 3760521.50000     482.84665     0.00    1-HR  1         1ST         NA
  364880.84400 3760483.75000     440.88376     0.00    1-HR  1         1ST         NA
  364879.62500 3760521.25000     436.30444     0.00    1-HR  1         1ST         NA
  364855.93800 3760482.50000     404.34717     0.00    1-HR  1         1ST         NA
  364854.62500 3760521.25000     396.31473     0.00    1-HR  1         1ST         NA
  364831.00000 3760481.50000     372.93332     0.00    1-HR  1         1ST         NA
  364829.62500 3760521.25000     362.19193     0.00    1-HR  1         1ST         NA
  364806.09400 3760480.25000     344.74896     0.00    1-HR  1         1ST         NA
  364804.62500 3760521.00000     332.76459     0.00    1-HR  1         1ST         NA
  364781.18800 3760479.00000     319.84494     0.00    1-HR  1         1ST         NA
  364779.62500 3760521.00000     306.71472     0.00    1-HR  1         1ST         NA
  364755.87500 3760483.00000     303.36316     0.00    1-HR  1         1ST         NA
  364754.62500 3760521.00000     283.89383     0.00    1-HR  1         1ST         NA
  364730.93800 3760482.25000     283.13910     0.00    1-HR  1         1ST         NA
  364729.62500 3760520.75000     264.07953     0.00    1-HR  1         1ST         NA
  365237.15600 3760448.25000    1064.03967     0.00    1-HR  1         1ST         NA
  365250.87500 3760414.75000     802.12109     0.00    1-HR  1         1ST         NA
  365273.87500 3760369.75000     604.17090     0.00    1-HR  1         1ST         NA
  365333.75000 3760269.00000     301.05530     0.00    1-HR  1         1ST         NA
  365372.15600 3760209.50000     201.68481     0.00    1-HR  1         1ST         NA
  365477.31300 3760208.00000     418.85764     0.00    1-HR  1         1ST         NA
  365477.31300 3760244.75000     367.90045     0.00    1-HR  1         1ST         NA
  365457.78100 3760244.75000     485.71234     0.00    1-HR  1         1ST         NA
  365339.75000 3760430.50000    1551.77844     0.00    1-HR  1         1ST         NA
  365684.93800 3760428.75000     153.19206     0.00    1-HR  1         1ST         NA
  365685.68800 3760473.25000     156.94138     0.00    1-HR  1         1ST         NA
  365435.59400 3760475.00000     795.78088     0.00    1-HR  1         1ST         NA
  365435.65600 3760543.75000     877.77728     0.00    1-HR  1         1ST         NA
  365229.53100 3760544.00000    3490.37012     0.00    1-HR  1         1ST         NA
  365229.68800 3760501.00000    3222.41016     0.00    1-HR  1         1ST         NA
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* ISCST3 (02035): NEPTUNE MARINA LST (FF – PM10)
* MODELING OPTIONS USED:
*  CONC        DDEP        URBAN FLAT  FLGPOL TOXICS                        NOCALM                ARDPLT
*         PLOT FILE OF  HIGH 1ST  HIGH 24-HR VALUES FOR SOURCE GROUP: 2
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (4(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC      DRY DEPO   ZELEV     AVE     GRP       HIVAL    NET ID
*
```

X	Y	AVERAGE CONC	DRY DEPO	ZELEV	AVE	GRP	HIVAL	NET ID
364863.37500	3760413.25000	0.72714	0.00054	0.00	24-HR	2	1ST	NA
364858.40600	3760448.50000	0.71473	0.00077	0.00	24-HR	2	1ST	NA
364845.40600	3760376.25000	0.48620	0.00032	0.00	24-HR	2	1ST	NA
364854.03100	3760344.50000	0.47580	0.00032	0.00	24-HR	2	1ST	NA
364862.62500	3760312.75000	0.52761	0.00036	0.00	24-HR	2	1ST	NA
364838.62500	3760409.75000	0.67832	0.00050	0.00	24-HR	2	1ST	NA
364833.65600	3760445.00000	0.65611	0.00071	0.00	24-HR	2	1ST	NA
364820.93800	3760371.75000	0.46607	0.00030	0.00	24-HR	2	1ST	NA
364830.06300	3760338.00000	0.43075	0.00028	0.00	24-HR	2	1ST	NA
364839.21900	3760304.25000	0.48321	0.00033	0.00	24-HR	2	1ST	NA
364813.87500	3760406.25000	0.63453	0.00047	0.00	24-HR	2	1ST	NA
364808.87500	3760441.50000	0.60568	0.00065	0.00	24-HR	2	1ST	NA
364795.75000	3760369.75000	0.46014	0.00029	0.00	24-HR	2	1ST	NA
364804.06300	3760339.25000	0.37605	0.00025	0.00	24-HR	2	1ST	NA
364812.34400	3760308.50000	0.43037	0.00029	0.00	24-HR	2	1ST	NA
364789.12500	3760402.75000	0.59399	0.00043	0.00	24-HR	2	1ST	NA
364784.12500	3760438.00000	0.56071	0.00060	0.00	24-HR	2	1ST	NA
364771.25000	3760365.50000	0.44052	0.00028	0.00	24-HR	2	1ST	NA
364780.00000	3760333.25000	0.34253	0.00022	0.00	24-HR	2	1ST	NA
364788.75000	3760300.75000	0.39567	0.00026	0.00	24-HR	2	1ST	NA
364764.37500	3760399.25000	0.55711	0.00041	0.00	24-HR	2	1ST	NA
364759.37500	3760434.50000	0.52092	0.00055	0.00	24-HR	2	1ST	NA
364746.71900	3760361.25000	0.42217	0.00026	0.00	24-HR	2	1ST	NA
364755.93800	3760327.00000	0.31342	0.00021	0.00	24-HR	2	1ST	NA
364765.15600	3760293.00000	0.36493	0.00024	0.00	24-HR	2	1ST	NA
364739.62500	3760395.75000	0.52380	0.00038	0.00	24-HR	2	1ST	NA
364734.62500	3760430.75000	0.48671	0.00051	0.00	24-HR	2	1ST	NA
365204.62500	3760522.50000	10.77225	0.01643	0.00	24-HR	2	1ST	NA
365179.68800	3760500.75000	5.33300	0.00751	0.00	24-HR	2	1ST	NA
365154.62500	3760522.25000	4.68331	0.00710	0.00	24-HR	2	1ST	NA
365129.62500	3760522.25000	3.72713	0.00526	0.00	24-HR	2	1ST	NA
365104.62500	3760522.00000	3.03838	0.00409	0.00	24-HR	2	1ST	NA
365079.62500	3760522.00000	2.53730	0.00334	0.00	24-HR	2	1ST	NA
365054.68800	3760500.50000	2.18104	0.00257	0.00	24-HR	2	1ST	NA
365029.68800	3760500.25000	1.90024	0.00224	0.00	24-HR	2	1ST	NA
365029.53100	3760543.50000	1.91665	0.00232	0.00	24-HR	2	1ST	NA
365004.68800	3760500.25000	1.66895	0.00196	0.00	24-HR	2	1ST	NA
364979.68800	3760500.25000	1.47909	0.00175	0.00	24-HR	2	1ST	NA
364979.53100	3760543.25000	1.50341	0.00181	0.00	24-HR	2	1ST	NA
364954.68800	3760500.00000	1.31867	0.00156	0.00	24-HR	2	1ST	NA
364929.68800	3760500.00000	1.18458	0.00141	0.00	24-HR	2	1ST	NA
364929.53100	3760543.00000	1.21260	0.00145	0.00	24-HR	2	1ST	NA
364905.75000	3760485.00000	1.04049	0.00119	0.00	24-HR	2	1ST	NA
364904.62500	3760521.50000	1.02869	0.00134	0.00	24-HR	2	1ST	NA
364880.84400	3760483.75000	0.95079	0.00108	0.00	24-HR	2	1ST	NA
364879.62500	3760521.25000	0.93364	0.00121	0.00	24-HR	2	1ST	NA
364855.93800	3760482.50000	0.87190	0.00098	0.00	24-HR	2	1ST	NA
364854.62500	3760521.25000	0.85292	0.00109	0.00	24-HR	2	1ST	NA
364831.00000	3760481.50000	0.80373	0.00090	0.00	24-HR	2	1ST	NA
364829.62500	3760521.25000	0.78273	0.00100	0.00	24-HR	2	1ST	NA
364806.09400	3760480.25000	0.74376	0.00082	0.00	24-HR	2	1ST	NA
364804.62500	3760521.00000	0.72092	0.00092	0.00	24-HR	2	1ST	NA
364781.18800	3760479.00000	0.69037	0.00076	0.00	24-HR	2	1ST	NA
364779.62500	3760521.00000	0.66720	0.00084	0.00	24-HR	2	1ST	NA
364755.87500	3760483.00000	0.64895	0.00071	0.00	24-HR	2	1ST	NA
364754.62500	3760521.00000	0.61979	0.00078	0.00	24-HR	2	1ST	NA
364730.93800	3760482.25000	0.60625	0.00066	0.00	24-HR	2	1ST	NA
364729.62500	3760520.75000	0.57724	0.00072	0.00	24-HR	2	1ST	NA
365237.15600	3760448.25000	4.27408	0.00294	0.00	24-HR	2	1ST	NA
365250.87500	3760414.75000	1.99958	0.00136	0.00	24-HR	2	1ST	NA
365273.87500	3760369.75000	0.90676	0.00070	0.00	24-HR	2	1ST	NA
365333.75000	3760269.00000	0.84303	0.00059	0.00	24-HR	2	1ST	NA
365372.15600	3760209.50000	0.71380	0.00066	0.00	24-HR	2	1ST	NA
365477.31300	3760208.00000	0.59963	0.00147	0.00	24-HR	2	1ST	NA
365477.31300	3760244.75000	0.81085	0.00185	0.00	24-HR	2	1ST	NA
365457.78100	3760244.75000	0.65516	0.00178	0.00	24-HR	2	1ST	NA
365339.75000	3760430.50000	2.62097	0.00371	0.00	24-HR	2	1ST	NA
365684.93800	3760428.75000	0.65023	0.00176	0.00	24-HR	2	1ST	NA
365685.68800	3760473.25000	0.86508	0.00135	0.00	24-HR	2	1ST	NA
365435.59400	3760475.00000	6.21537	0.01809	0.00	24-HR	2	1ST	NA
365435.65600	3760543.75000	36.05822	0.04324	0.00	24-HR	2	1ST	NA
365229.53100	3760544.00000	16.70150	0.02306	0.00	24-HR	2	1ST	NA
365229.68800	3760501.00000	12.54091	0.01482	0.00	24-HR	2	1ST	NA

WIND STUDY

NEPTUNE MARINA

MARINA DEL REY, CALIFORNIA

RWDI Project Number: 00-248

DRP Project Number: 99-205

Date: December 21, 1999

Submitted by: Rowan Williams Davies & Irwin Inc.

Principal - Colin Williams, Ph.D., P.Eng.

Project Manager - Bill Waechter, CET

Technical Co-ordinator - Mark J. Moran, B.Sc.

Submitted to: County of Los Angeles

Department of Regional Planning

Impact Analysis Section

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1. INTRODUCTION

Rowan Williams Davies & Irwin Inc. (RWDI) was requested by the County of Los Angeles to undertake a detailed wind study on the development of Neptune Marina (Neptune Marina Development (Project 99-205). The study addressed the wind study requirements of the Los Angeles County Zoning Code, including an assessment of the effects of the proposed developments on Neptune Marina and/or building placement on wind patterns within the marina, loss of surface winds used by birds and sailboats and general air circulation.

2. TEST METHODOLOGY

Wind tunnel tests were conducted on a scale model of a section of Marina del Rey to determine the impact on the wind conditions resulting from the proposed development. This report provides a summary of the results of these wind tunnel tests on Basins B, C, and on land-based locations, which includes selected building roof tops for off-site areas.

A 1 inch = 40 feet scale model of the study area and the proposed developments were assembled as shown in Figures 1 through 3. The model was instrumented with a total of 52 wind sensors and tested in RWDI's boundary layer wind tunnel for the predominant wind directions, which are west, west-southwest, southwest, and east. The sensors were developed by RWDI for use on scale models and are capable of measuring both mean wind speed and wind direction.

Tests were conducted to simulate and measure wind conditions: as they exist today (Figure 1), after the proposed development on Neptune Marina (Figure 2), and the expected future development with the proposed development on Neptune Marina and Parcels 12, 15, and 20 (Figure 3) constructed. Plan views of each of the tested configurations are given on Figure 4. The results presented in this report pertain to the model of the proposed development constructed on Neptune Marina using the architectural design drawings provided by the County of Los Angeles Department of Regional Planning and received by RWDI on November 15, 1999.

The wind tunnel results for all predominant wind directions in the Los Angeles area have been examined in detail and are presented in this report. The west, west-southwest, southwest and east wind directions together account for winds that occur a majority of the time, as shown on Figure 5. The wind roses on Figure 5 show the percentage of the time that wind blows from each of 16 directions during spring, summer, fall and winter for the hours of 7:00 am through 9:00 pm, when most sailing would occur. All of the tests were conducted for the above four wind directions.

Information on the mean wind speeds and direction recorded at each sensor location for all wind directions tested for the existing, proposed and expected development conditions can be obtained from Figures 6 through 9. Each figure presents local wind direction data at each location for one of the four approaching wind directions that were tested. The length of the arrows are proportional to the speed of the wind at each location. In each figure there are three color coded arrows at each sensor location, black to indicate the local wind direction for existing site conditions, red for the proposed Neptune Marina, and green for the configuration with developments on Neptune Marina and Parcels 12, 15 and 20 present.

The analysis of Basins B and C considered if the proposed developments will result in changes to the local wind direction or mean speed between adjacent sensors that are greater than the difference presently experienced between any two adjacent sensors. Until criterion are established by the County of Los Angeles, this is the best method of assessing the impact of the proposed developments on the sailing conditions in the marina.

It should be noted that the sensors at Locations 12, 22 and 24 became inoperative for all angles during the testing and Location 6 became inoperative for the Southwest direction, therefore, there are no data for these locations.

3. EFFECTS ON SAILING CONDITIONS

Figures 6 through 9 show that a majority of the red arrows (Proposed configuration) are aligned with the black arrows (existing condition) and have the same length. Therefore the wind direction and wind speed are unaffected at a majority of the areas around the development by addition of the buildings proposed to be built on Neptune Marina. The only exception to this occurs at the west end of Basins B and C during periods of westerly winds. For all of the westerly winds tested, particularly the southwest direction, a localized zone of altered wind direction and speeds occurs in Basin B and C at the west end on Basin B and C. An example of this is if a mariner is traveling through the area defined by Sensors 13, 14, 15 and 16 there will be difference in both wind speed and direction (approximately a 60 degree wind shift between Sensors 13 and 14 as shown by the red arrows) noticed following construction of the Neptune Marina. At this location in the basin it is assumed that mariners are docking or leaving a slip and would therefore be under power.

The effect of constructing the expected development can be determined by comparing the black colored arrows to the green. Again a majority of the arrows have the same direction and length, with the exception of the extreme west end of Basins B and C. The affected area is localized around Sensors 1, 2, 12, 13, 14, 15, 23, and 31 for the westerly wind directions. Again it is assumed that boats in this area will be docking or leaving a slip and will therefore be under power.

4. LOSS OF SURFACE WINDS USED BY BIRDS

In order to assess the effects on birds of changes in the surface winds a report was prepared by an expert in the aerodynamics, kinematics and behavior of birds. This report has been attached as Appendix A. The author of the report considered the following issues:

- the types of birds likely to inhabit Marina del Rey
- the ability of birds to take off and land,
- soaring conditions upwind and downwind of the proposed building,
- effects on local thermal soaring conditions, and
- changes due to flight efficiency due to turbulence.

It was concluded that the proposed development will not result in major changes to birds' use of surface winds "due to the relatively minor nature of the changes expected, the wide variety of airspeeds birds are capable of flying at, the divers flight strategies employed by birds and the relatively small percentage of total area where measurable impacts will be observable".

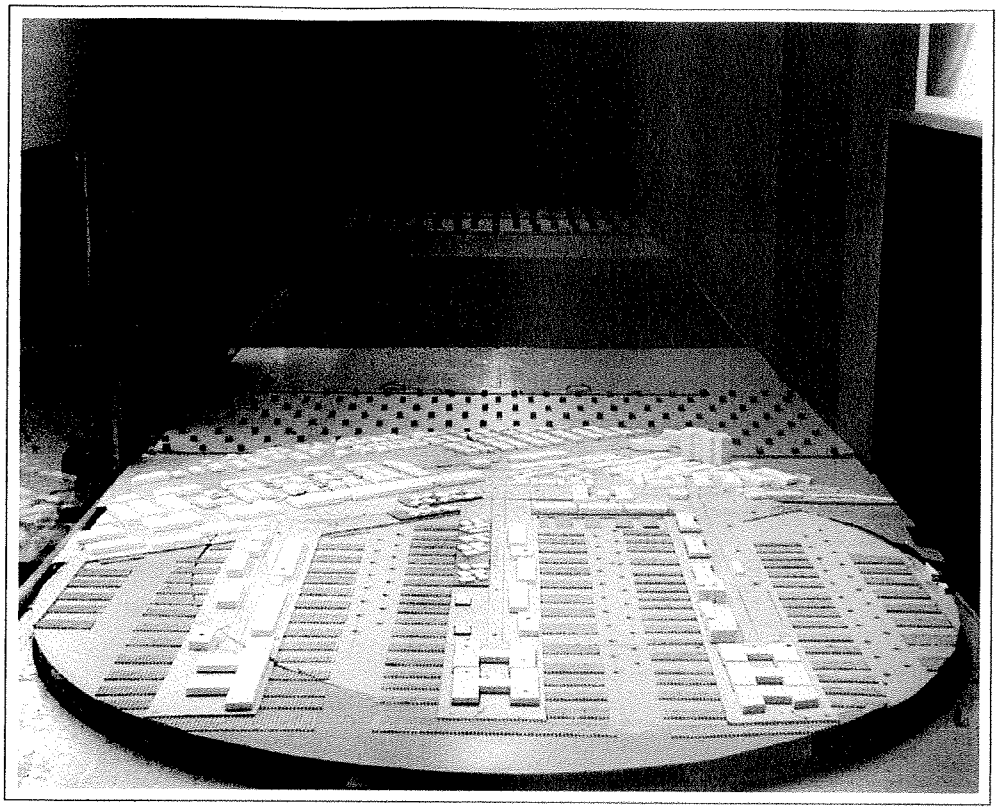
5. GENERAL AIR CIRCULATION PATTERNS

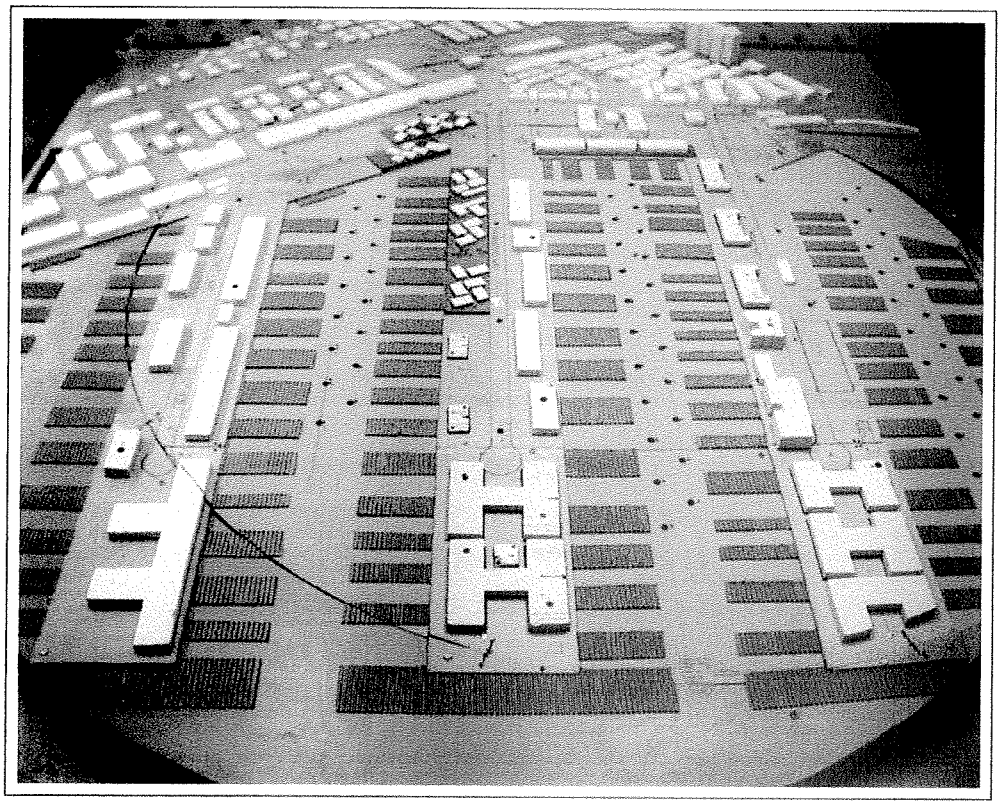
Changes in wind speed and direction were recorded only in the immediate vicinity of the proposed development. Due to the localized nature of these changes there will be no effect on the general air circulation patterns within Marina del Rey.

6. CONCLUSIONS

From the results of this wind study, it has been concluded that the proposed Neptune Marina will produce similar wind conditions over a majority of the areas of Marina del Rey. There will be localized areas of altered wind directions and speeds at the west end of Basins B and C. The change in wind conditions noted at the west end of Basins B and C is assumed not to be significant as boats would be under power at this location in the marina.

The overall wind conditions predicted with the proposed and expected future developments are similar to those presently experienced in and around the marina and therefore the general air circulation patterns and the use of surface winds by birds will not be affected.





Wind Tunnel Study Model
Existing Conditions

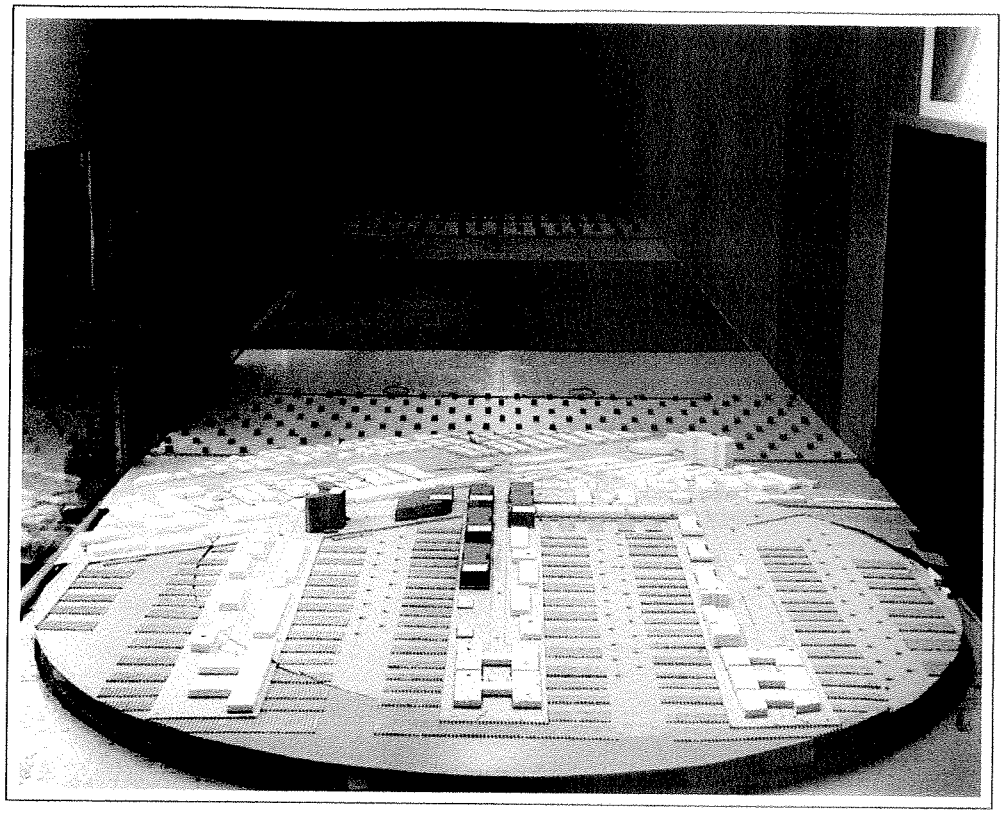
Neptune Marina - Marina del Rey, CA

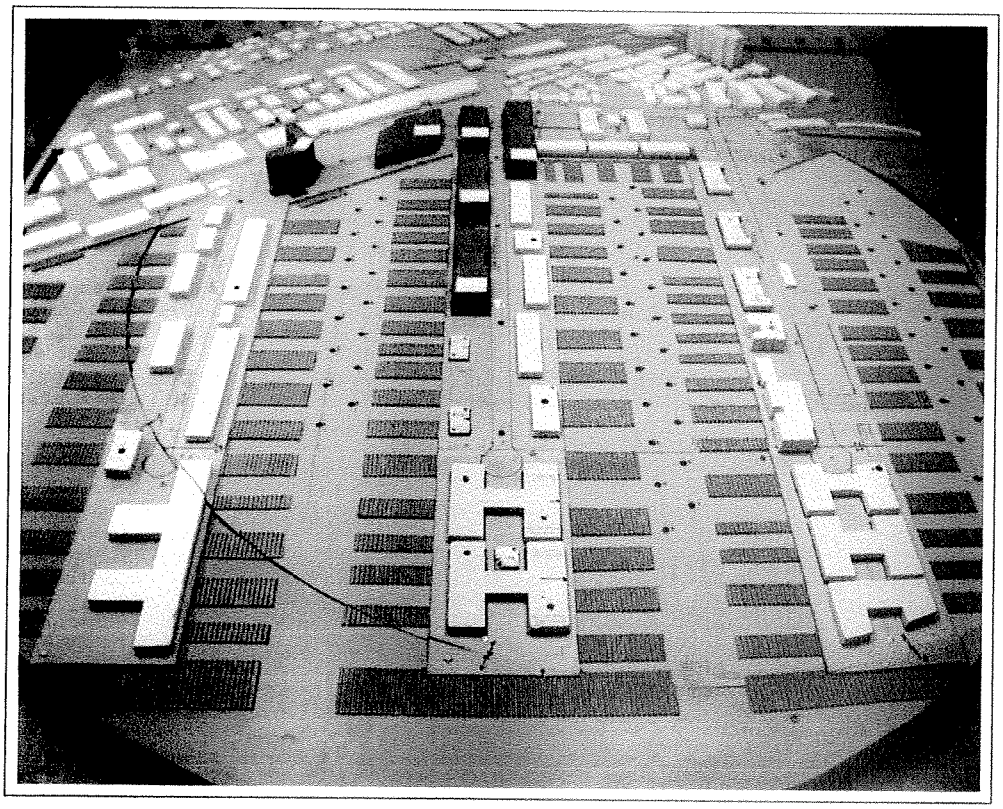
Project #00-248

Figure No. 1

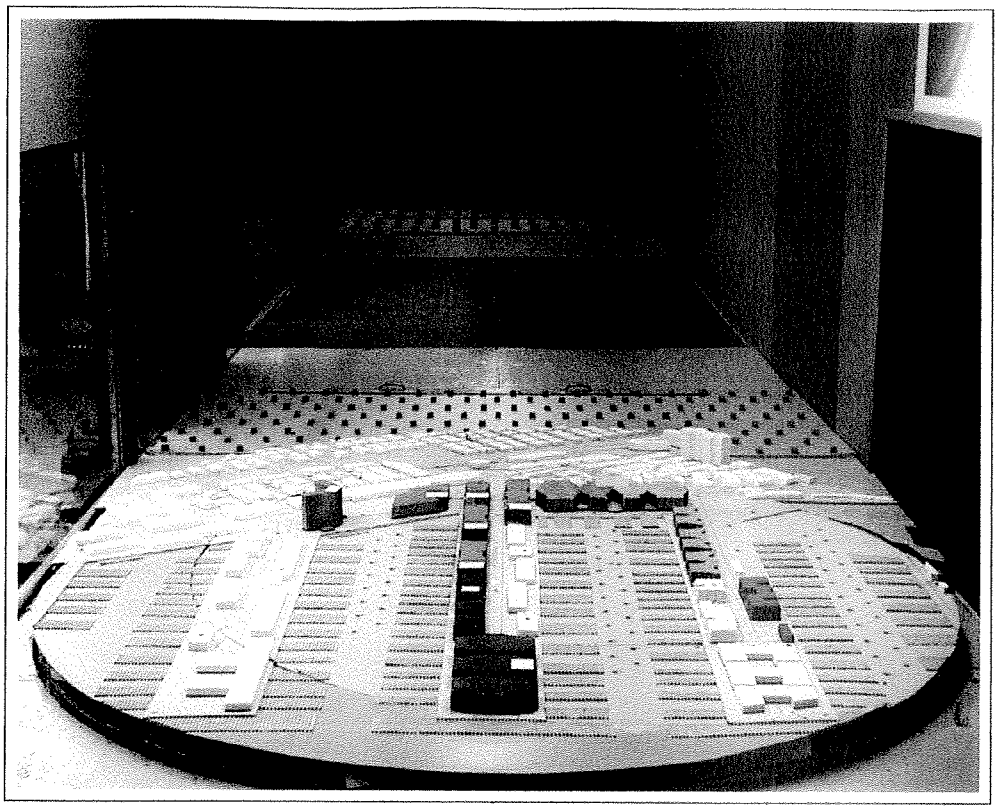
Date: December 20, 1999

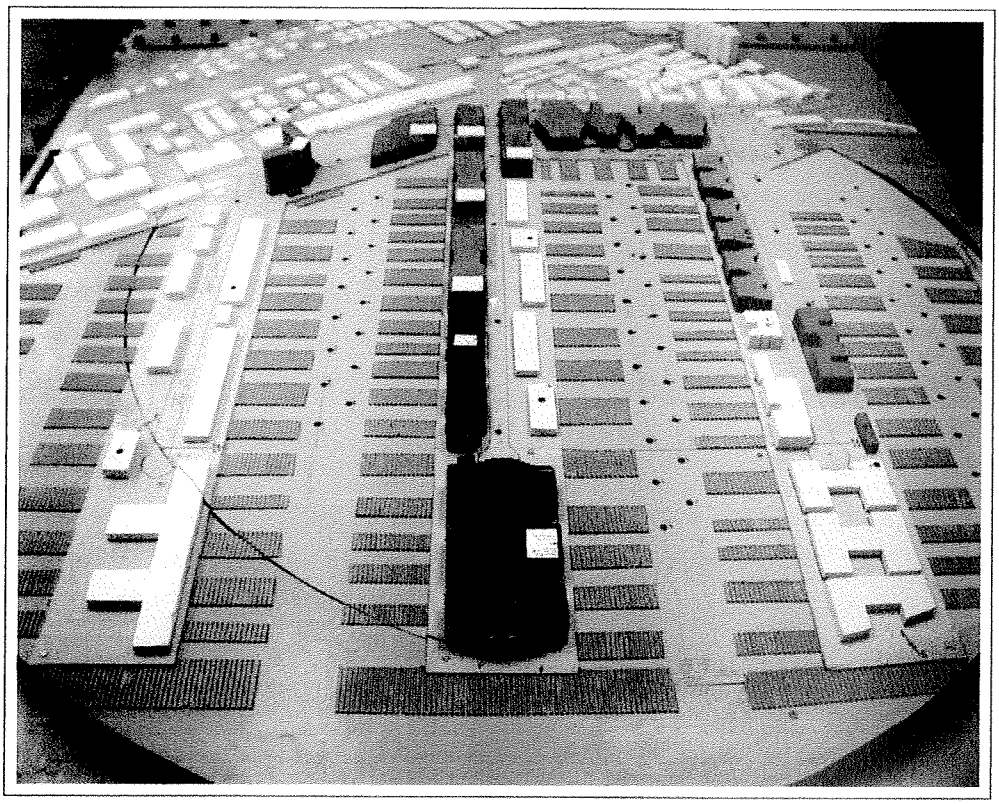
RWDI



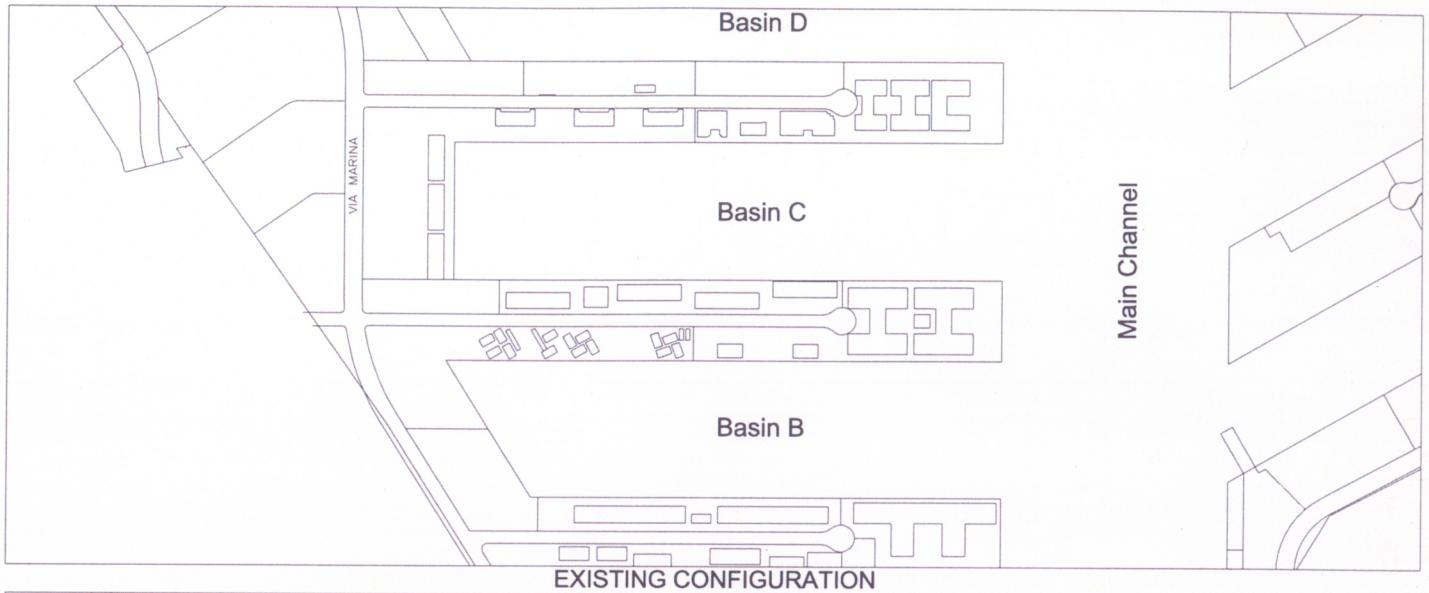


Wind Tunnel Study Model Proposed Developments	Figure No. 2	RWDI
Neptune Marina - Marina del Rey, CA Project #00-248	Date: December 20, 1999	

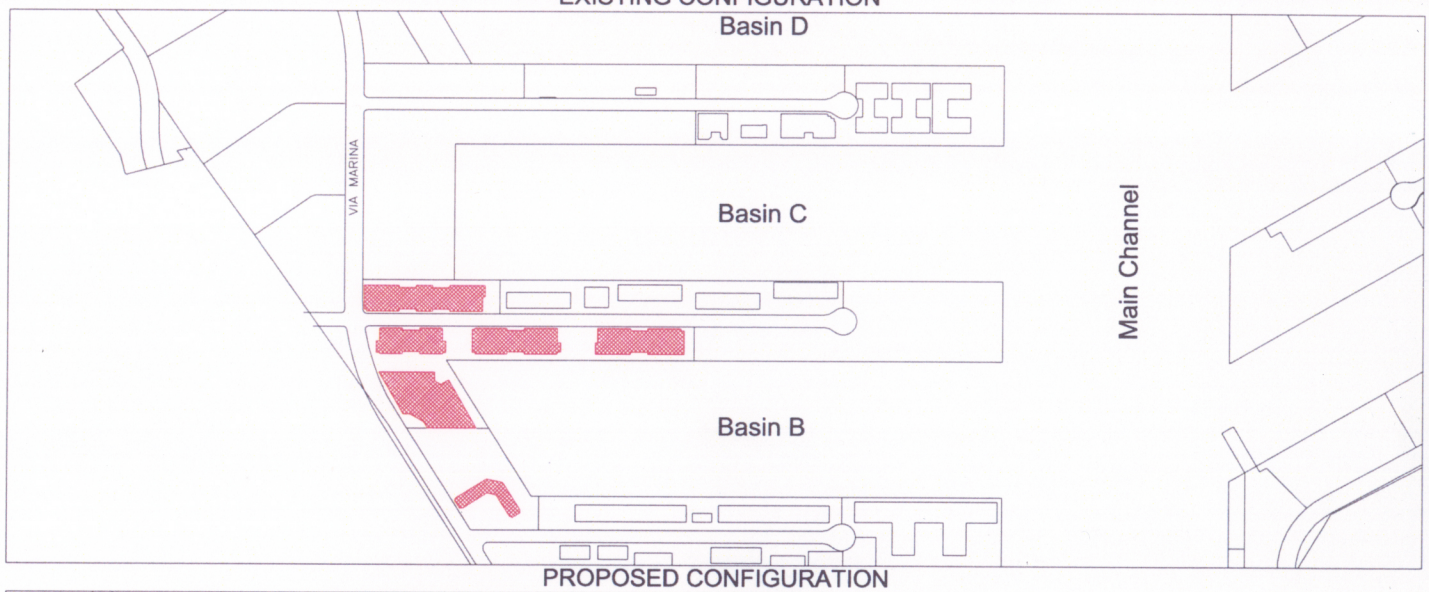




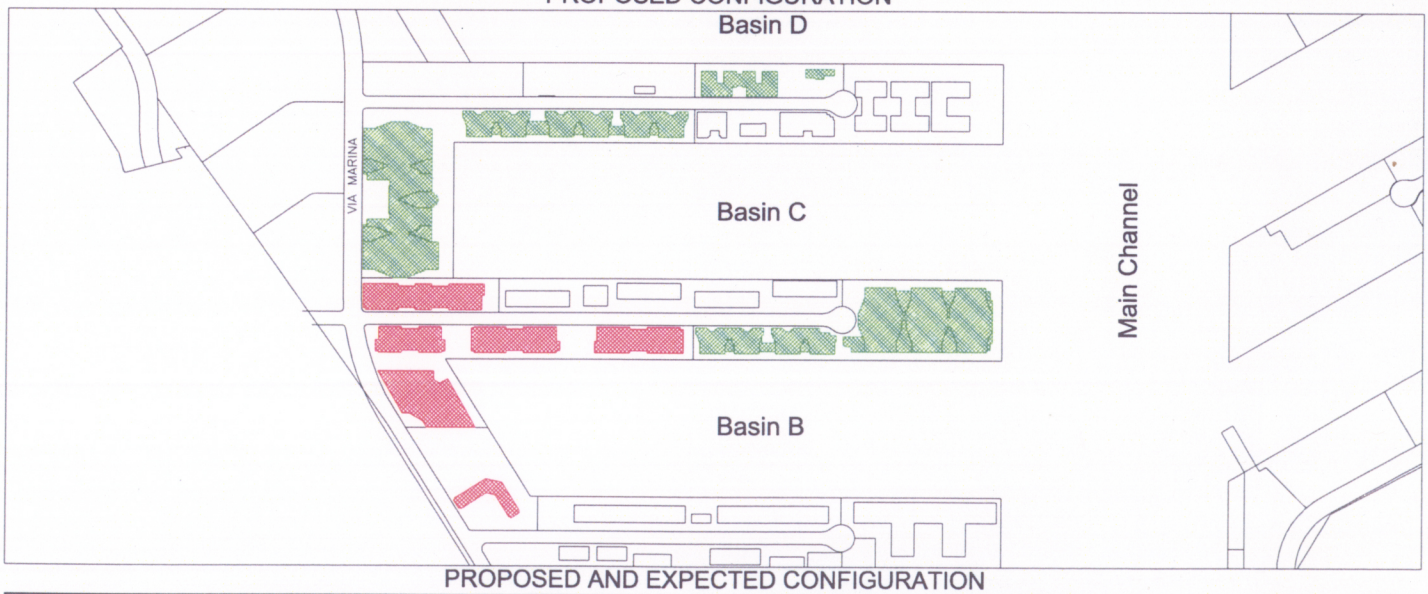
Wind Tunnel Study Model Proposed and Expected Developments	Figure No. 3	RWDI
Neptune Marina - Marina del Rey, CA Project #00-248	Date: December 20, 1999	



EXISTING CONFIGURATION



PROPOSED CONFIGURATION



PROPOSED AND EXPECTED CONFIGURATION

Key Plan Showing Configurations Tested

True North

Drawn by: DJM | Figure: 4

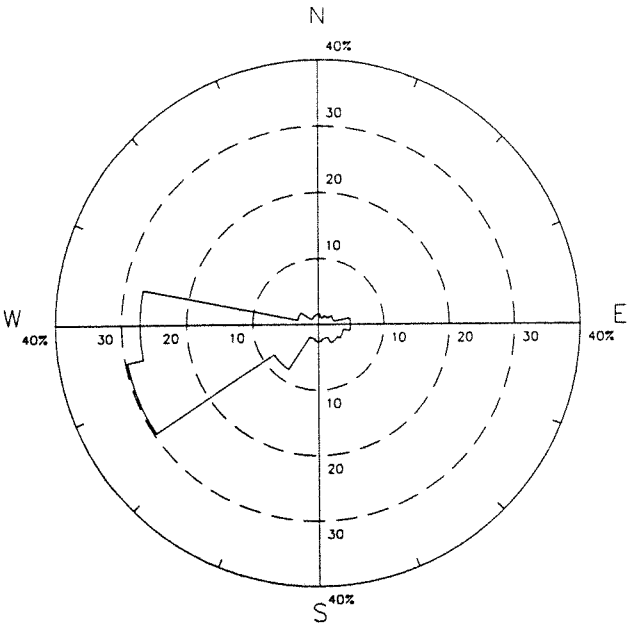
Approx. Scale: N.T.S.

Date Revised: Dec. 23, 1999

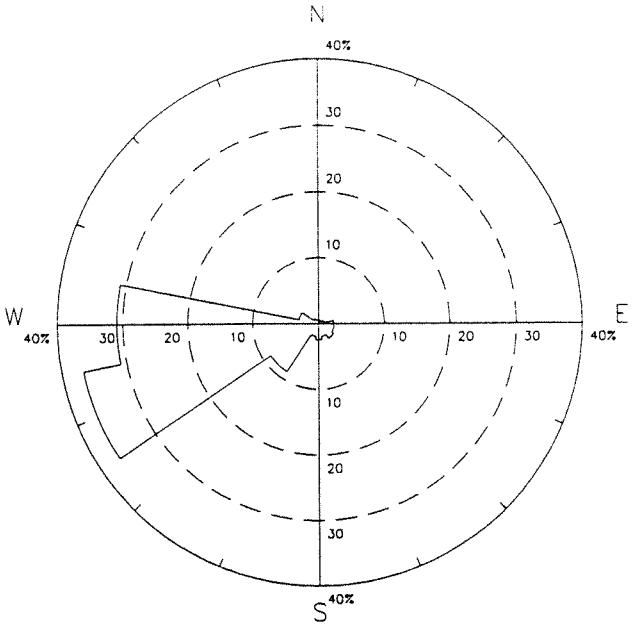
RWDI

Neptune Marina - Marina del Rey, CA

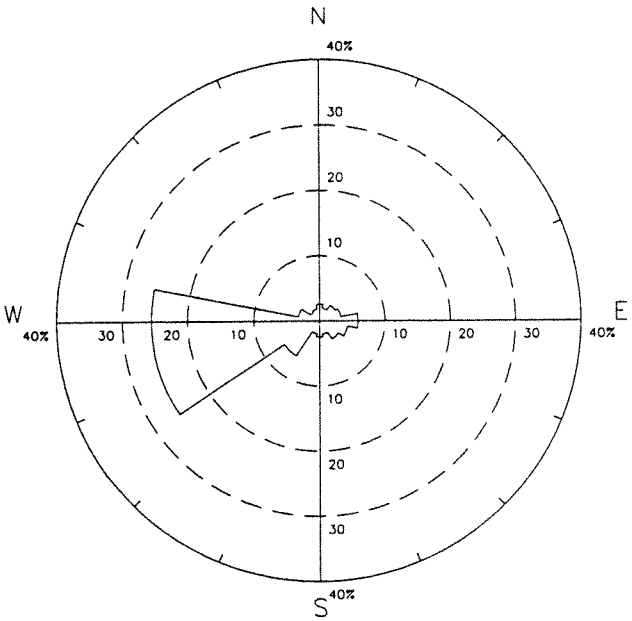
Project #00-248



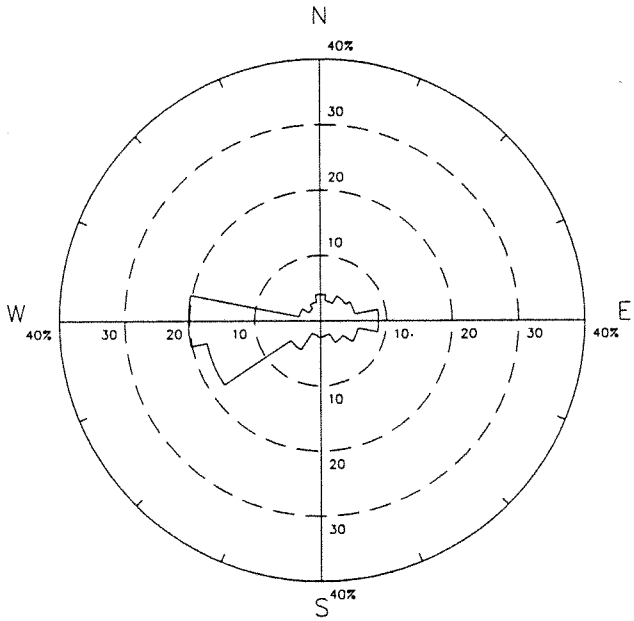
SPRING
(March, April, May)



SUMMER
(June, July, August)



FALL
(September, October, November)



WINTER
(December, January, February)

Directional Distribution of Seasonal Winds **(7:00 am - 9:00 pm)** **Los Angeles International Airport (1947 - 1990)** Neptune Marina - Marina del Rey, CA Project #00-248	Figure No. 5 Date: December 20, 1999	RWDI

Note:
Data not available for sensors without arrows

LEGEND:

- Existing
- Proposed
- Expected

Arrow length proportional to mean wind speed

Local Wind Direction - Wind from the West

Neptune Marina - Marina del Rey, CA

True North

Project #00-248

Drawn by:	DJM	Figure:	6
Approx. Scale:	1"=350'		
Date Revised:	Dec 23, 1999		

RWDI

Note:
Data not available for sensors without arrows

LEGEND:

Existing
Proposed
Expected

Arrow length proportional to mean wind speed

Local Wind Direction - Wind from the West-southwest

Neptune Marina - Marina del Rey, CA

True North

Project #00-248

Drawn by:	DJM	Figure:	7
Approx. Scale:		1"=350'	
Date Revised:		Dec 23, 1999	

RWDI

Note:
Data not available for sensors without arrows

LEGEND:

Existing
Proposed
Expected

Arrow length proportional to mean wind speed

Local Wind Direction - Wind from the Southwest

Neptune Marina - Marina del Rey, CA

True North

Project #00-248

Drawn by:	DJM	Figure:	8
Approx. Scale:	1"=350'		
Date Revised:	Dec 23, 1999		

RWDI

Note:
Data not available for sensors without arrows

LEGEND:

Existing
Proposed
Expected

Arrow length proportional to mean wind speed

Local Wind Direction - Wind from the East

Neptune Marina - Marina del Rey, CA

True North

Project #00-248

Drawn by:	DJM	Figure:	9
Approx. Scale:		1"=350'	
Date Revised:		Dec 23, 1999	

RWDI

May 29, 2006

CONSULTING ENGINEERS
& SCIENTISTS

Rowan Williams
Davies & Irwin Inc.
650 Woodlawn Road West
Guelph, Ontario
Canada N1K 1B8

A member of the
RWDI Group of Companies

Mr. Aaron Clark
Land Use/Government Specialist
Armbruster & Goldsmith LLP
10940 Wilshire Boulevard, Suite 2100
Los Angeles, California
90024

Re: Neptune Marina - Wind Study
Marina del Rey, California
RWDI Reference No. 04-1319B

Email: aaron@ag-landuse.com

Dear Aaron:

As per your request, this letter summarizes our opinions as to the effects on the marina wind conditions that may be caused by recent design changes in Neptune Marina (Parcel 10R) in Marina del Rey.

RWDI conducted a wind tunnel study in December 1999 for the proposed Neptune Marina development, including buildings on Parcels 10R, 9U and FF. More recently in April 2004 and October 2005, the buildings on Parcels 10R and FF were tested in wind tunnel studies as future developments together with a proposed hotel tower on Parcel 9U. These tests provided results of the effects of the proposed development on Parcel 10R on wind patterns within the marina and general air circulation.

It was concluded in our December 21, 1999 report for the Neptune Marina development that the overall wind conditions are unaffected at a majority of the areas around the development by addition of the buildings proposed to be built on Neptune Marina. Changes in wind speed and direction were recorded only in the immediate vicinity of the proposed development during periods of westerly winds. Due to the localized nature of these changes there will be no effect on the general air circulation patterns within Marina del Rey.

Recently, the design of the Neptune Marina Development was changed slightly. As shown in the attached Site Plan, two buildings on the west portion of Parcel 10R were combined into one. The opening between Buildings 1 and 2 was reduced and the opening between Buildings 2 and 3 was increased. The building height was reduced from 60 ft to 55ft.

RWDI
CONSULTING ENGINEERS & SCIENTISTS

Rowan Williams
Davies & Irwin Inc.
650 Woodlawn Road West
Guelph, Ontario
Canada N1K 1B8

A member of the RWDI Group of Companies

These changes are not considered to be significant. The building height is essentially unchanged. The openings between buildings are in a north-south direction and changes in opening size will not affect winds from the prevailing west, west-southwest and east directions. For the southwest winds, changes in wind conditions will unlikely be felt in Basin C, due to the distance and existing buildings between Basin C and the proposed development. According to previous studies, localized effects may be induced by the proposed Neptune Marina development at the west end of Basin B for westerly winds. These effects are expected to remain with the revised design.

Overall, similar wind conditions are expected with the revised design for all prevailing wind directions.

The above opinion is based on the wind tunnel data, revised design information of Neptune Marina, local wind climate and our experience and engineering judgement. If you have any questions in this regard, please do not hesitate to contact us.

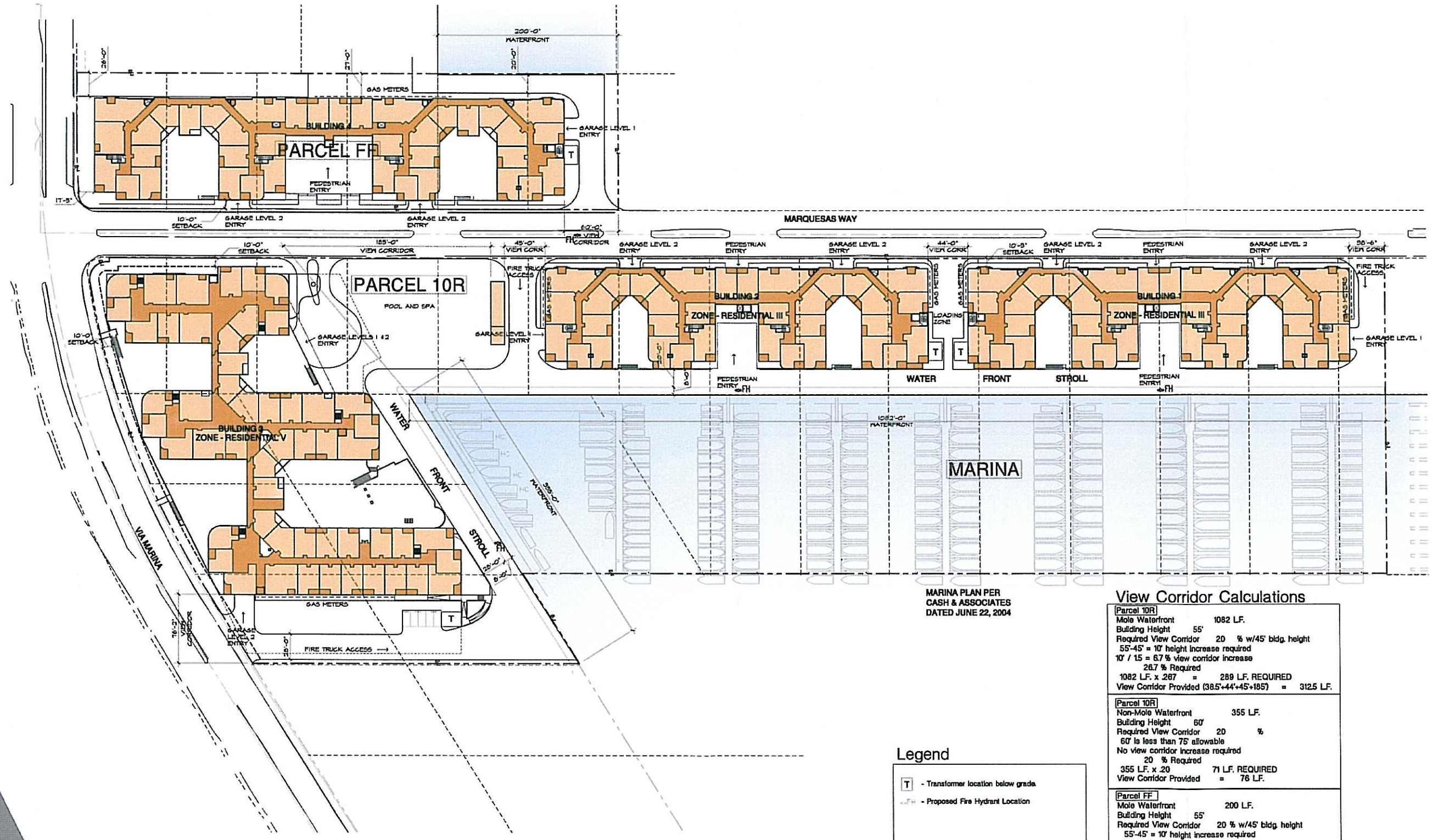
Your very truly,

ROWAN WILLIAMS DAVIES & IRWIN Inc.

Hanqing Wu, Ph.D., P.Eng.
Senior Specialist / Associate

Dan Bacon
Senior Project Manager / Associate

DEB/smd
Attach.



MARINA PLAN PER
CASH & ASSOCIATES
DATED JUNE 22, 2004

View Corridor Calculations

Parcel 10R
Mole Waterfront 1082 LF.
Building Height 55'
Required View Corridor 20 % w/45' bldg. height
55'-45' = 10' height increase required
10' / 15 = 6.7 % view corridor increase
26.7 % Required
1082 LF. x .267 = 289 LF. REQUIRED
View Corridor Provided (38.5'+44'+45'+185') = 312.5 LF.

Parcel 10R
Non-Mole Waterfront 355 LF.
Building Height 60'
Required View Corridor 20 %
60' is less than 75' allowable
No view corridor increase required
20 % Required
355 LF. x .20 71 LF. REQUIRED
View Corridor Provided = 76 LF.

Parcel FF
Mole Waterfront 200 LF.
Building Height 55'
Required View Corridor 20 % w/45' bldg. height
55'-45' = 10' height increase required
10' / 15 = 6.7 % view corridor increase
26.7 % Required
200 LF. x .267 53 LF. REQUIRED
View Corridor Provided = 60 LF.

Legend

T - Transformer location below grade
FH - Proposed Fire Hydrant Location

THOMAS P. COX: ARCHITECTS, INC.

LEGACY PARTNERS

NEPTUNE MARINA, Marina Del Rey, California

Site Plan

FULL SIZE DRAWING SCALE: 1" = 40'-0"

March 6, 2006
2003-083

DCB Submittal

RWDI

WIND STUDY

WOODFIN SUITE HOTEL AND VACATION OWNERSHIP RESORT

MARINA DEL REY, CALIFORNIA

Project Number: 04-1319

Date: April 23, 2004

Submitted by: Rowan Williams Davies & Irwin Inc.

Technical Co-ordinator - Tony Ledwick, B.Sc.

Project Manager - Dan Bacon

Project Director - Colin Williams, Ph.D., P.Eng.

Submitted to: Woodfin Suite Hotels, LLC

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- Calgary (403) 232-6771
- Vancouver (604) 730-5688
- Ottawa (613) 225-5648

U.S. Contacts:
RWDI LLC
- California (909) 793-7080

1. INTRODUCTION

Rowan Williams Davies & Irwin Inc. (RWDI) was requested by the Woodfin Suite Hotels, LLC to undertake a detailed wind study on the proposed Woodfin Suite Hotel and Vacation Ownership Resort in Marina del Rey, California. The study addressed the wind study requirements of the Los Angeles County Zoning Code, including an assessment of the effects of the proposed developments and/or building placement on wind patterns within the marina, loss of surface winds used by sailboats and birds and general air circulation.

2. TEST METHODOLOGY

Wind tunnel tests were conducted on a scale model of a section of Marina del Rey to determine the impact on the wind conditions resulting from the proposed Woodfin Suite Hotel and Vacation Ownership Resort and future developments. This report provides a summary of the results of these wind tunnel tests on Basins A, B, C, and on land-based locations.

A 1:500 scale model of the study area and the proposed developments were assembled as shown in Figures 1a, 1b and 1c. Tests were conducted to simulate and measure wind conditions: as they exist today (Figure 1a); after the proposed Woodfin Suite Hotel and Vacation Ownership Resort (Figure 1b); and the expected future development with the proposed development (Figure 1c).

The results presented in this report pertain to the model of the proposed Woodfin Suite Hotel and Vacation Ownership Resort constructed using the architectural design drawings received by RWDI on January 16, 2004. The model was instrumented with a total of 47 wind sensors and tested in RWDI's boundary layer wind tunnel for the predominant wind directions, which are west, west-southwest, southwest, and east. The sensors were developed by RWDI for use on scale models and are capable of measuring both changes in wind speed and wind direction.

The wind tunnel results for all predominant wind directions in the Los Angeles area have been examined in detail and are presented in this report. The west, west-southwest, southwest and east wind directions together account for winds that occur a majority of the time, as shown in Figure

periods when the winds are from the west (Figure 3a). During west winds, test locations along Basin B show a wind direction shift to the south of approximately 15 degrees for most of the basin (Locations 23 through 37) when the proposed Woodfin Suite Hotel and Vacation Ownership Resort is added. This wind direction shift may be beneficial to mariners docking their yachts under sail power as they will no longer be sailing directly into the winds when they are blowing from the west. Also, changes in the local wind direction between adjacent sensors are similar for the proposed and existing conditions in this area of the basin. The magnitude of the winds along Basin B will remain similar between the existing and proposed scenarios. Basin B sensors in the area closest to the proposed development (Locations 19, 20, 21, 22 and 23) will see a small increase in wind speeds from winds flowing off the Woodfin Suite Hotel and Vacation Ownership Resort building. There are also some localized directional differences between the sensors at the west end of Basin B. As mariners are in the final stages of docking it is assumed that this is not an issue. These areas are generally close to the proposed development.

Due to the localized nature of these changes there will be no significant effect on the general air circulation patterns within Basins A, B and C in Marina del Rey.

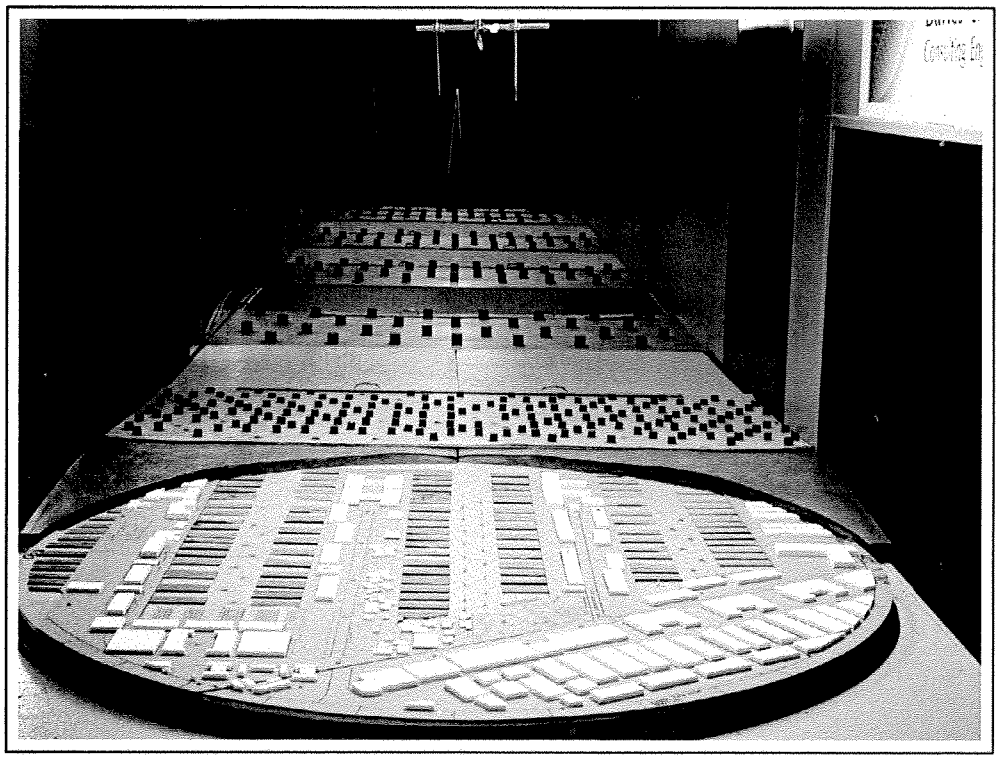
3.1.2 Future Conditions

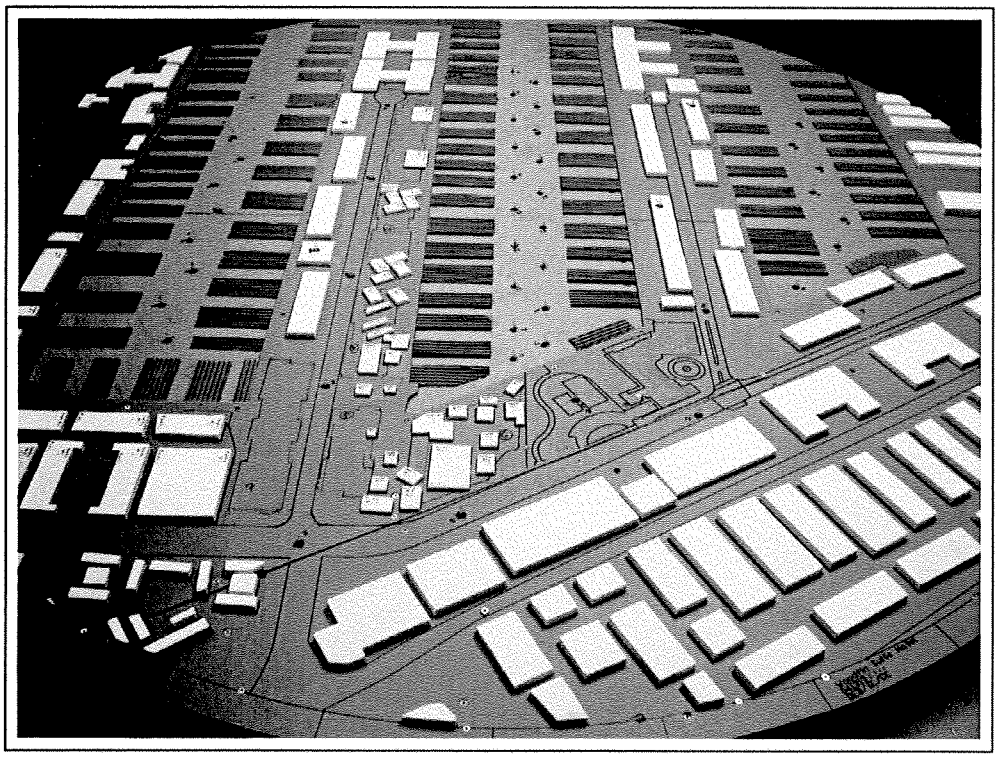
The effect of constructing the Woodfin Suite Hotel and Vacation Ownership Resort with future buildings can be determined by comparing the red arrows to the blue arrows. The majority of the arrows have the same direction and length for the four tested wind directions. Differences in wind direction and magnitude between the proposed and future test configurations occurred primarily on the north side of Basin B when the winds were from the west direction. The blue future arrows in this area generally showed similar levels of magnitude and were directionally situated between the existing (black) and proposed (red) arrows. Other differences occurred at several locations on Basin C for the westerly wind directions. These differences are caused by localized wind flow changes created by the addition of the future buildings west and south of Basin C.

6. CONCLUSIONS

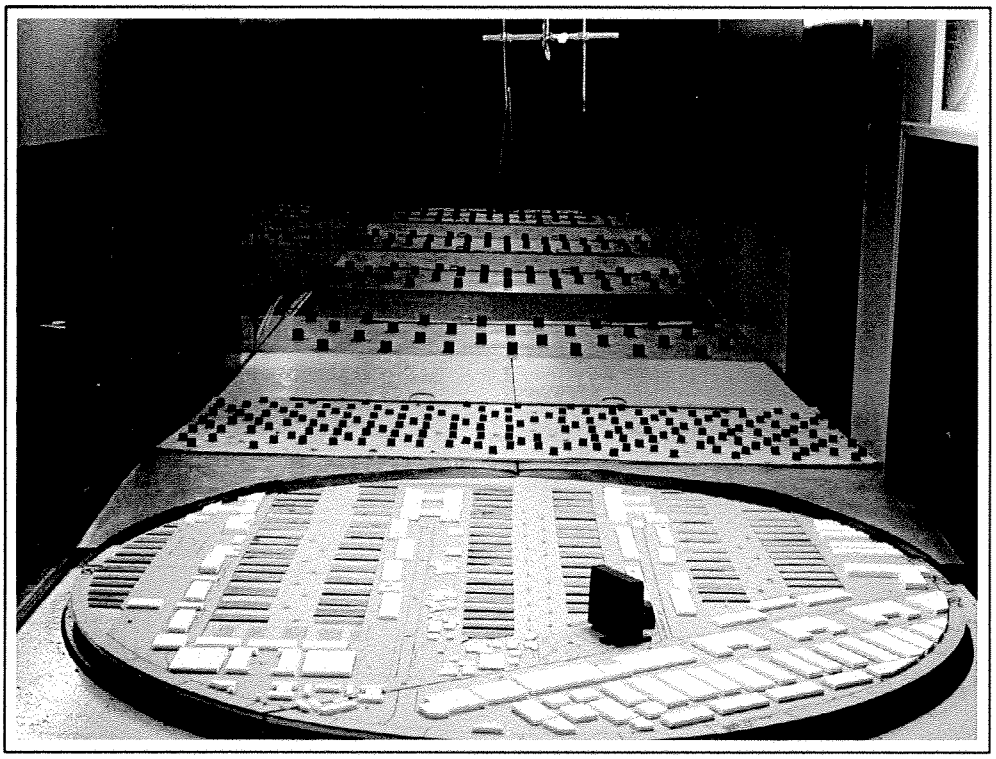
From the results of this wind study, it has been concluded that the proposed Woodfin Suite Hotel and Vacation Ownership Resort and future buildings will produce similar wind conditions over a majority of the areas of Marina del Rey. There will be areas of altered wind directions along Basin B when wind are from the west. This change in wind direction is expected to be beneficial as the winds, when they are moving from west to east, will tend to be redirected to flow to a more east-northeast and northeasterly direction, away from the approaching yachts entering Basin B. There will also be localized areas where changes in wind direction and magnitude occur such as the west end of Basin C. These areas are generally close to the proposed and future developments. Due to the localized nature of these changes there will be no effect on the general air circulation patterns within Basins A, B and C in Marina del Rey.

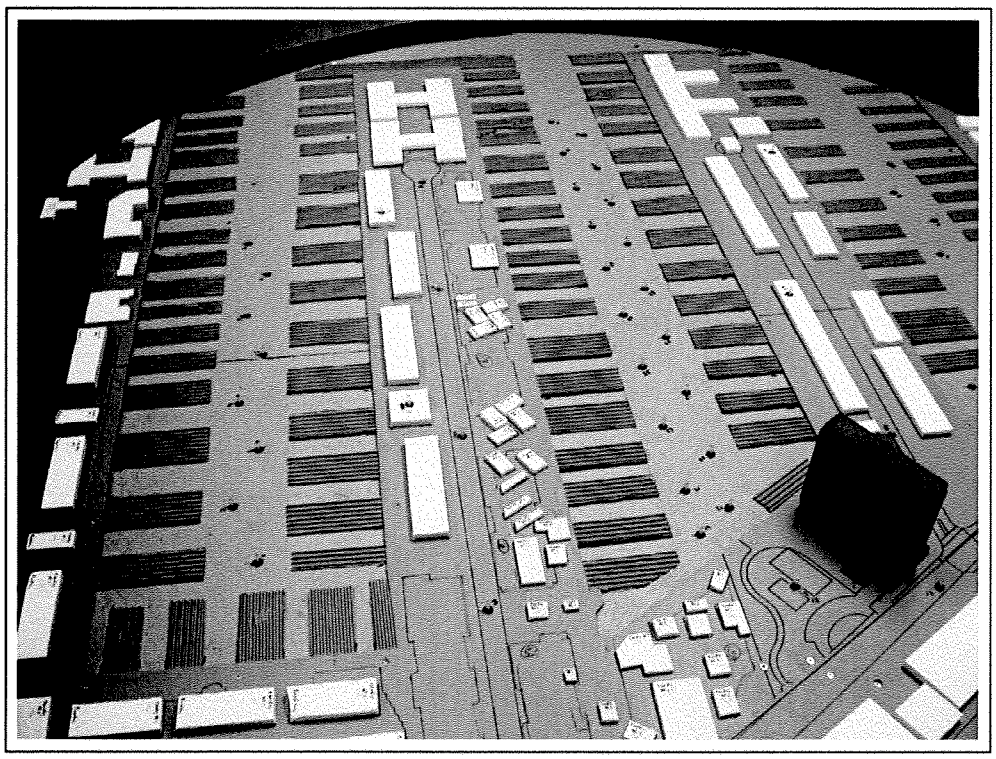
The overall wind conditions predicted with the proposed and expected future developments are similar to those presently experienced in and around the marina and therefore the general air circulation patterns and the use of surface winds by birds will not be affected.



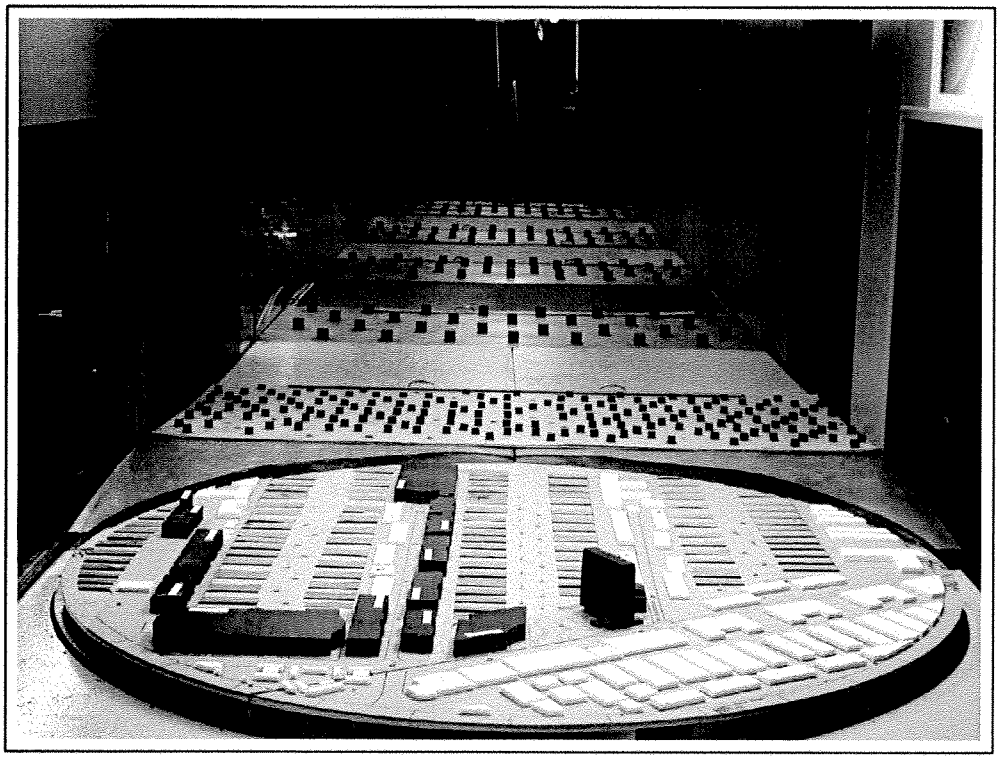


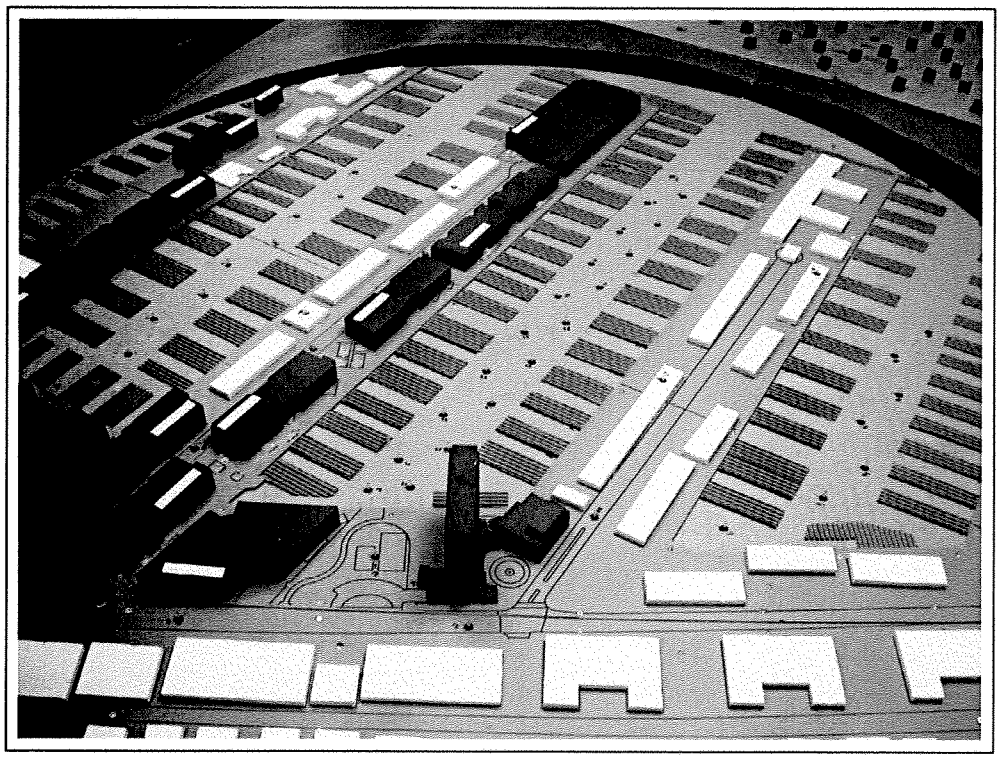
Wind Tunnel Study Model **Existing** Project #04-1319 **Woodfin Suite Hotel and Vacation Ownership Resort - Marina del Rey, California**	Figure No. 1a Date: April 21, 2004	RWDI



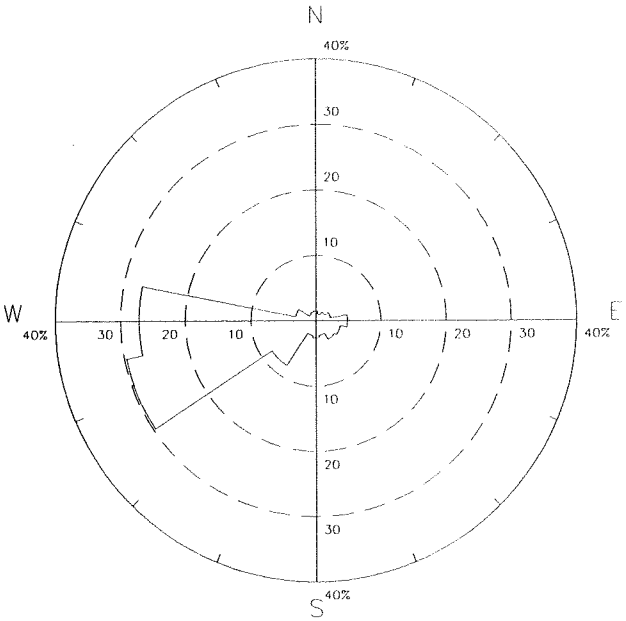


Wind Tunnel Study Model **Proposed** Project #04-1319 **Woodfin Suite Hotel and Vacation Ownership Resort - Marina del Rey, California**	Figure No. 1b Date: April 21, 2004	RWDI

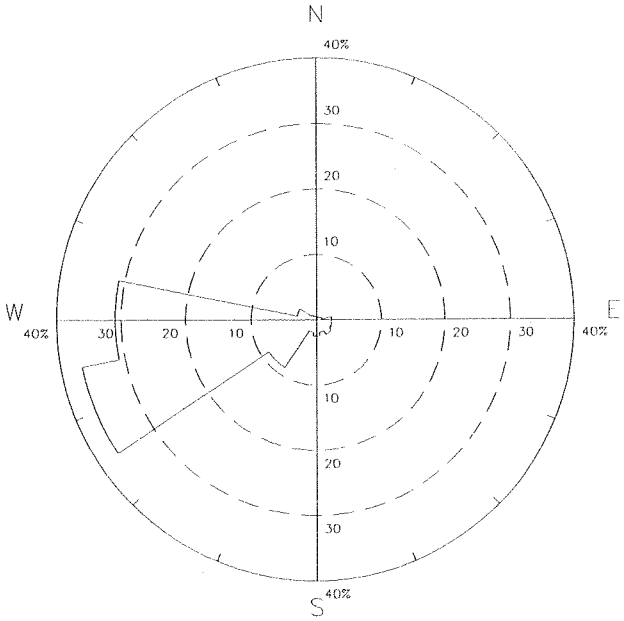




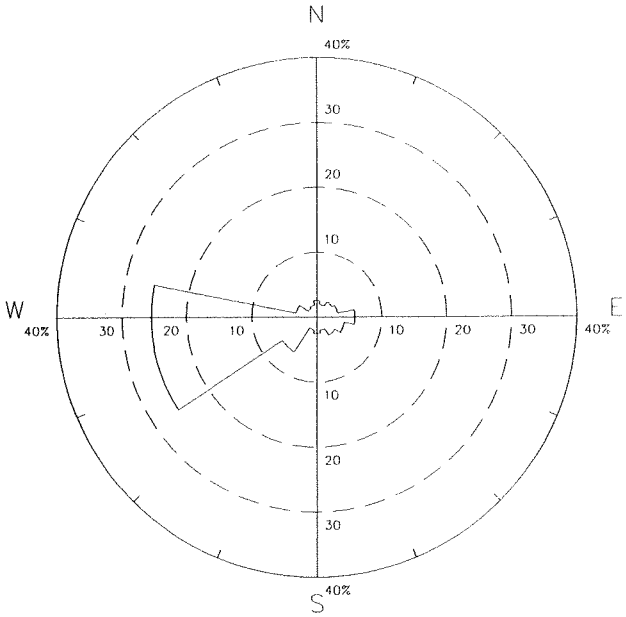
Wind Tunnel Study Model **Future** **Woodfin Suite Hotel and Vacation Ownership Resort - Marina del Rey, California**	Project #04-1319	Figure No. 1c Date: April 23, 2004	RWDI



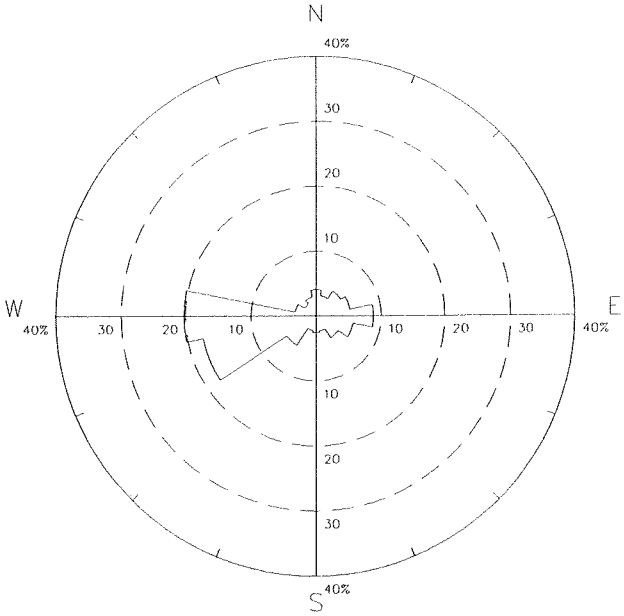
SPRING
(March, April, May)



SUMMER
(June, July, August)

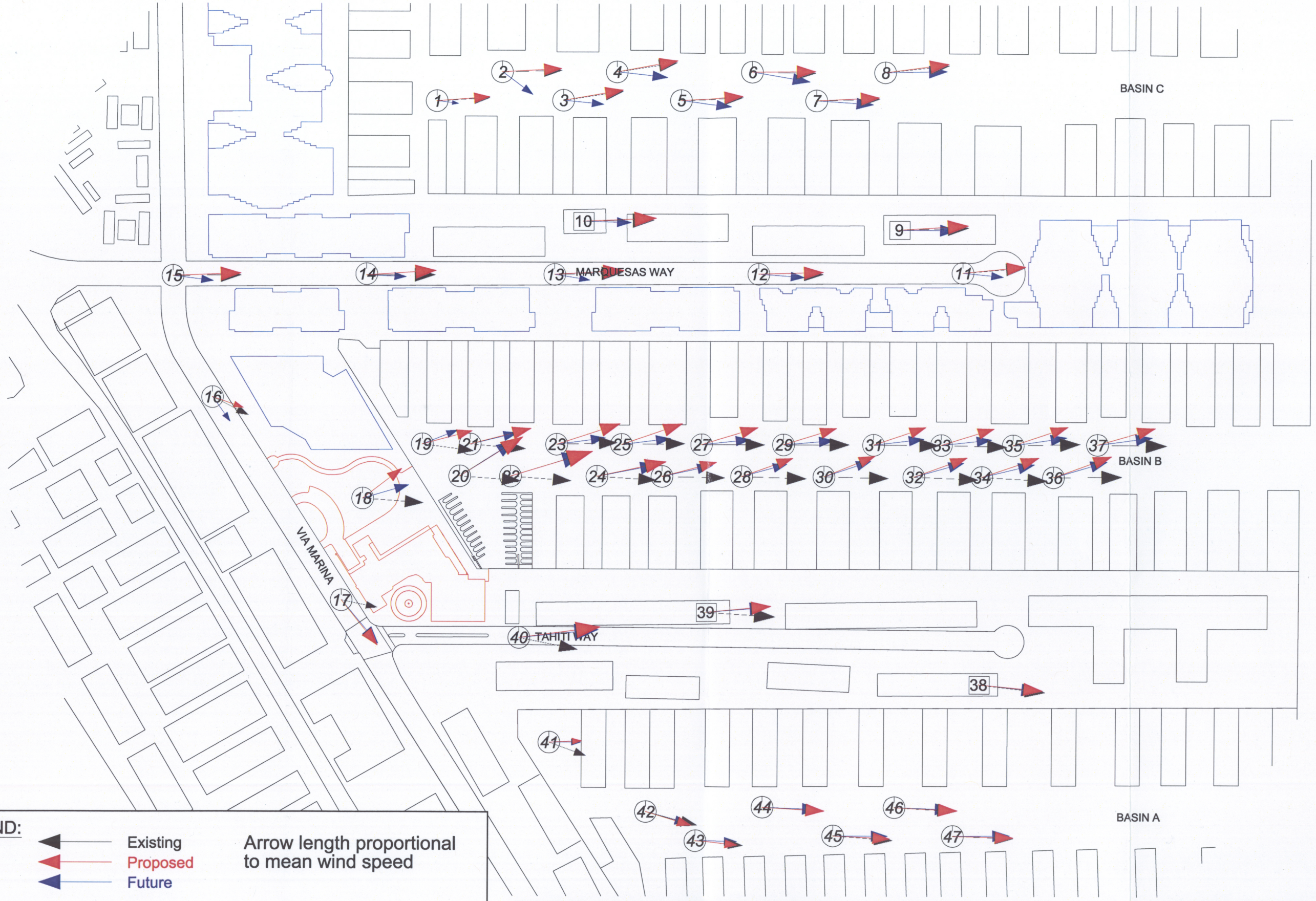


FALL
(September, October, November)



WINTER
(December, January, February)

Directional Distribution of Seasonal Winds **(7:00 am - 9:00 pm)** **Los Angeles International Airport (1947 - 1990)** Woodfin Suite Hotel and Vacation Ownership Resort - Marina del Rey, California Project #04-1319	Figure No. 2 Date: April 20, 2004	RWDI



LEGEND:

Existing
Proposed
Future

Arrow length proportional to mean wind speed

SENSOR LOCATION:
Grade Level
Above Grade

BUILDINGS OUTLINES IN: BLACK - EXISTING
RED - PROPOSED
BLUE - FUTURE

0 130 260ft

Local Wind Direction - Wind from the West

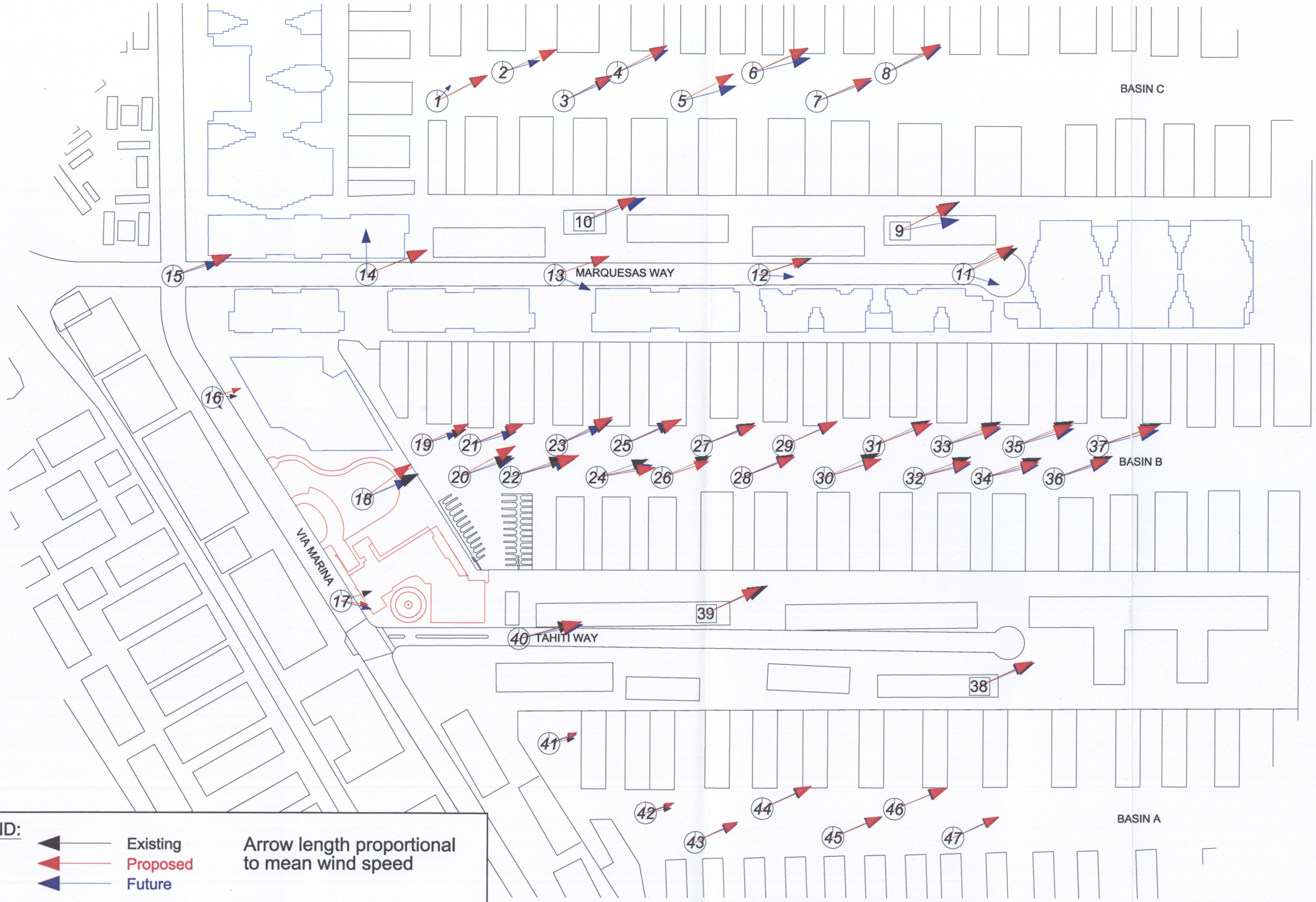
Woodfin Suite Hotel and Vacation Ownership Resort - Marina del Rey, California

True North

Project #04-1319

Drawn by: KMT	Figure: 3A
Approx. Scale:	1"=260'
Date Revised:	Apr. 23, 2004

RWDI



LEGEND:

Existing
Proposed
Future

Arrow length proportional to mean wind speed

SENSOR LOCATION:
Grade Level
Above Grade

BUILDINGS OUTLINES IN: BLACK - EXISTING
RED - PROPOSED
BLUE - FUTURE

0 130 260ft

Local Wind Direction - Wind from the West-southwest

True North

Woodfin Suite Hotel and Vacation Ownership Resort - Marina del Rey, California

Project #04-1319

Drawn by: KMT	Figure: 3B	RWDI
Approx. Scale:	1"=260'	
Date Revised: Apr. 23, 2004		

BASIN C

MARQUESAS WAY

BASIN B

VIA MARINA

TAHITI WAY

BASIN A

LEGEND:

Existing
Proposed
Future

Arrow length proportional to mean wind speed

SENSOR LOCATION:
Grade Level
Above Grade

BUILDINGS OUTLINES IN: BLACK - EXISTING
RED - PROPOSED
BLUE - FUTURE

0 130 260ft

Local Wind Direction - Wind from the Southwest

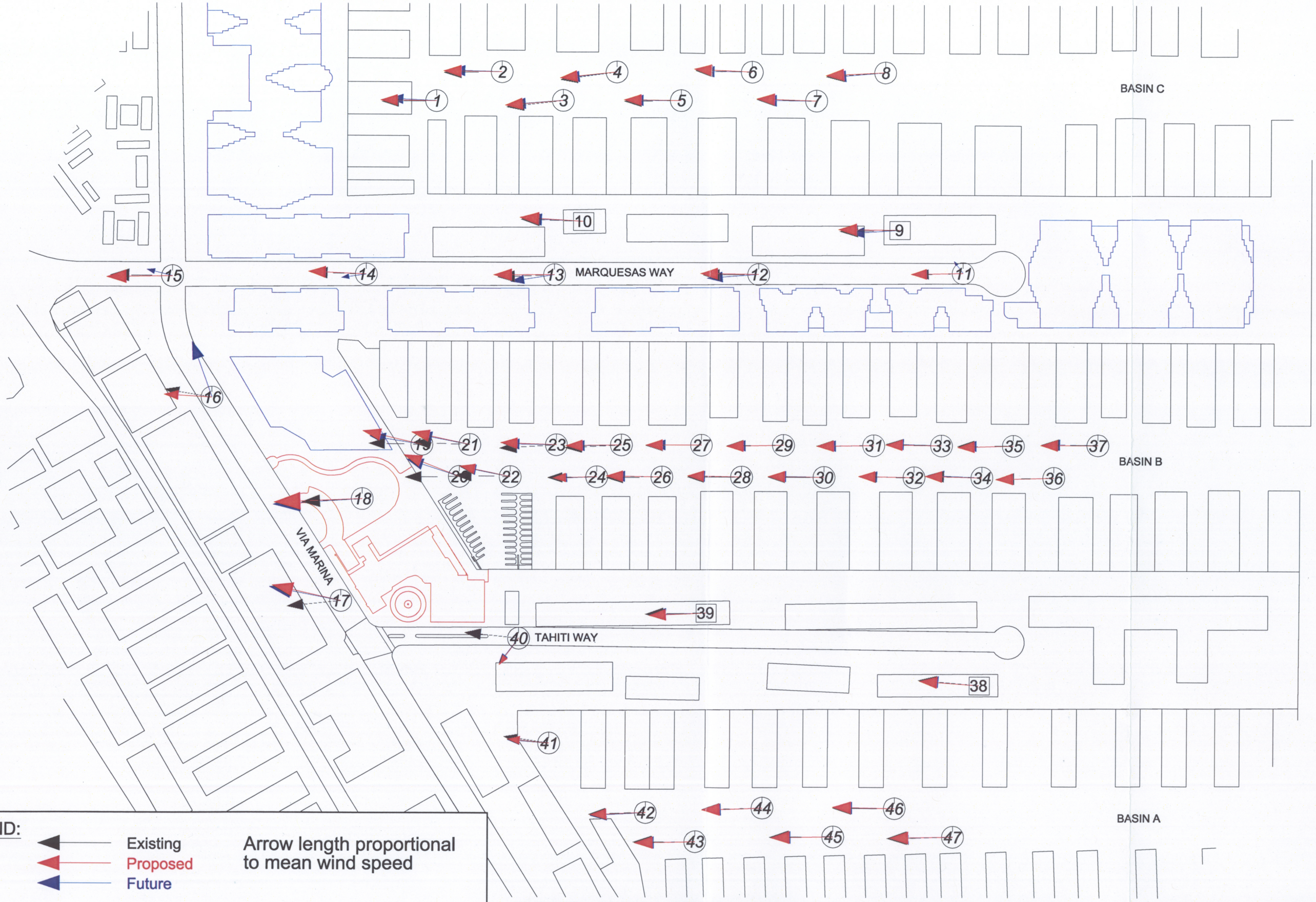
Woodfin Suite Hotel and Vacation Ownership Resort - Marina del Rey, California

True North

Project #04-1319

Drawn by: KMT	Figure: 3C
Approx. Scale:	1"=260'
Date Revised:	Apr. 23, 2004

RWDI



LEGEND:

Existing
Proposed
Future

Arrow length proportional to mean wind speed

SENSOR LOCATION:
Grade Level
Above Grade

BUILDINGS OUTLINES IN: BLACK - EXISTING
RED - PROPOSED
BLUE - FUTURE

0 130 260ft

Local Wind Direction - Wind from the East

True North

Woodfin Suite Hotel and Vacation Ownership Resort - Marina del Rey, California

Project #04-1319

Drawn by: KMT	Figure: 3D	RWDI
Approx. Scale:	1"=260'	
Date Revised: Apr. 23, 2004		

APPENDIX A

Effect of a proposed structure at Marina Del Rey, California on surface winds used by local birds.

A report prepared For Rowan Williams Davies & Irwin Inc.

Wayne Bezner Kerr
Migratory Bird Research Group

Attn: Colin Williams
Principal,
Rowan, Williams, Davies and Irwin Inc.

From: Wayne Bezner Kerr
Migratory Bird Research Group

Re: **Effect of a proposed structure at Marina del Rey, California on surface winds used by local birds.**

The proposed structure at Marina del Rey appears to be fairly straight forward, insofar as use of surface winds by local and/or transient populations of birds are concerned. In response to your request I have undertaken a literature search on the aerodynamics, kinematics and behaviors of flying birds. Combined with my own observations from four seasons of experimental work with flying birds of different weights, wing loadings and Reynolds numbers (Re), I have formed some basic conclusions regarding the project under discussion. My conclusions are presented under five general subheadings.

1. Changes to surface winds on open water:

The concept of "surface winds" does not necessarily apply to birds in powered flight, at least as far as wind strength and direction are concerned. Unlike humans who experience wind relative to a fixed frame of reference on the ground, birds in flight always experience a direct headwind exactly equal to their airspeed and heading. Thus, a gull in steady state flight at 21 knots on a heading of 090 degrees will always experience a 21 knot east wind, regardless of actual wind strength and direction at the time of observation. The actual track described by a bird in flight will be the vector of the birds heading less the vector of the wind at that moment. Birds in translational, foraging and migratory flight may fly with wind speeds equal to or greater than their actual flying speed at angles greater than 90 degrees to their intended course (Kerlinger 1989). By altering airspeeds and headings, birds are able to complete flights along a desired ground track in a range of winds much greater than the expected changes to winds measured at the surface at Marina Del Rey.

In our experiments with migratory waterfowl and wading birds, we have seen that changes to

wind direction and strength can create problems for birds when taking off or landing in confined areas. For the few moments while a bird is accelerating during takeoff or decelerating during landing it is generally limited to headings that take it directly against the wind. On open water such as the channel found at Marina Del Rey, birds are able to takeoff and land in almost any direction, allowing unrestricted flight in winds from any direction. In my opinion, predicted changes to surface winds at Marina Del Rey are unlikely to have a measurable negative effect on local birds.

2. Changes to ridge soaring conditions downwind of the structure:

Some species commonly observed at Marina Del Rey exploit winds deflected upwards against vertical structures in a behavior known as "ridge soaring". Ridge soaring birds minimize the energy expended to remain aloft while in translational, foraging and migratory flight. The energy savings gained through the use of ridge lift are proportional to wind speed and the proportion of wind directed perpendicular to the obstruction (Kerlinger 1989). Ridge soaring birds may use lift provided by wind deflecting over and around towers, buildings, boats, hills and other structures. In my opinion, the predicted changes in wind speed and direction as a result of the proposed structure at Marina Del Rey are unlikely to significantly affect ridge soaring birds exploiting flows directed upwards along the downwind shore of the channel.

3. Changes to ridge soaring conditions upwind of the structure.

It is reasonable to expect that some ridge soaring behavior will occur on the upwind facing side of the structure under discussion. A new structure with a face oriented within 45 degrees to the prevailing wind direction will generate lift on days when winds are sufficiently strong. Soaring birds moving across the area can derive energetic benefits by diverting slightly to pass through the area of rising air. In my opinion, several species of birds observed at Marina Del Rey will likely utilize ridge lift created by the proposed structure at least occasionally.

4. Changes to local thermal soaring conditions:

Some species present at Marina Del Rey utilize small columns of rising warm air known as thermals to reduce the energy expended while climbing. Thermal conditions are relatively rare in coastal areas, especially at sites surrounded by water where stable marine air suppresses thermal

activity (Lindsay 1988). Thermal lift at Marina Del Rey is most likely found over larger built up or constructed areas such as docks, parking lots and buildings. In my opinion, a microscale change to the total built horizontal area at Marina Del Rey such as the addition or removal of a single building is unlikely to result in a measurable change to thermal frequency, size or distribution.

5. Changes to flight efficiency due to turbulence.

Birds, like miniature aircraft are subject to basic laws of aerodynamics. Generally speaking, birds of the weights and speeds observed at Marina Del Rey operate at Reynolds numbers (Re) between approximately 70,000 and 250,000 (Pennycuick 1989). Like artificially constructed airfoils, bird wings can be adversely affected by turbulence (Lissaman 1983), at least hypothetically reducing lift by a large degree. It is important to note that atmospheric turbulence occurs over a broad range of scales. Low speed airfoils operating at Re similar to birds observed at Marina Del Rey are most likely to suffer reduced aerodynamic performance where turbulence occurs at scales approximately 1/4 the average wingspan. Microscale turbulence in this range is short lived in the atmosphere, and is more typical of flows around small, complicated structures such as sailboat rigging or tree branches than larger solid structures. Larger scale wake vortices and eddies typical of flow downwind of large buildings is likely experienced by birds as long period changes to the free stream air, rather than aerodynamically disruptive turbulence *per se.* In my opinion, turbulence created by the proposed structure is unlikely to result in reduced aerodynamic efficiency of birds flying at Marina Del Rey.

Conclusion:

The addition or removal of a building at Marina Del Rey will undoubtably result in changes to local winds in the altitudes and areas utilized by birds. However, due to the relatively minor nature of the changes expected, the wide variety of airspeeds birds are capable of flying at, the diverse flight strategies employed by birds and the relatively small percentage of total area where measurable impacts will be observable, it is my opinion that the proposed structure will not result in major changes to birds' use of surface winds at Marina Del Rey.

Related Readings:

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1990 **Bird Flight**. Facts on File. New York.160 pp.

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1995. **The moment of inertia of bird wings and the inertial power requirement for flapping flight**. The Journal of Experimental Biology 198, 1655-1664

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Guelph, Ontario
N1G 2E1

Recent Work and Research Experience:

1998 - Present	M.Sc. Candidate.	Dept of Zoology University of Guelph Guelph, Ontario
1996 - 1999	Coordinator	Trumpeter Swan Migration Project Migratory Bird Research Group Guelph, Ontario
1995	Researcher	Sandhill Crane Induced Migration - Experiment Operation Migration Blackstock, Ontario

Publications:

1999 W. Bezner Kerr. **Imprinting techniques and the development of in flight following behavior in migratory trumpeter swans**. North American Swans 28 (3) (in press).

1998 W. Bezner Kerr. **No Swan Songs Here**. FAI AirSports International. Vol 1. http://airsports.fai.org/

1997 W. Bezner Kerr. **Swan Songs.** Dofasco Illustrated News. Dec. Pp 12-13

1996 Lishman, W.A., T.L. Teets, J. Duff, W.J.L. Sladen, G.G. Shire, K. Goolsby, W.A. Bezner Kerr, and R.P. Urbanek. 1997. **A reintroduction technique for migratory birds: Leading canada geese and isolation-reared sandhill cranes with ultralight aircraft**. Proc. North Am. Crane Workshop 7:114-122

Wayne Bezner Kerr, *continued ...*

Presentations:

September 1999 **The Use of Induced Migration Techniques in the Restoration of Migratory Populations of Trumpeter Swans (Cygnus buccinator).** 17th Trumpeter Swan Society Conference. Idaho Falls (scheduled)

July 1999 **The Use of Ultralight Aircraft in Waterfowl Restoration and Research.** COPA Annual Convention. North Bay

March 1998 **Trumpeter Swan Migration Project Overview.** North Bay Naturalists Association.

Awards, Scholarships and Research Support:

1999 Ontario Graduate Scholarship in Science and Technology
1999 Trumpeter Swan Society Certificate of Special Appreciation.
1999 USUA Public Service Award.
1999 Elgin Card Scholarship in Terrestrial Ecology
1999 University of Guelph Graduate Scholarship.
1998 Canada Trust Friends of the Environment Grant
1998 - 99 EcoAction 2000 Grant
1998 University of Guelph Graduate Scholarship.
1998 University of Guelph Graduate Scholarship.
1998 OFAH Waterfowl Ecology Grant.
1998 Conrad N Hilton Foundation Research Grant

Selected ISCST3 Output for Parcels 10R and FF

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*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
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*         FOR A TOTAL OF  1899 RECEPTORS.
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* ISCST3 (02035): NEPTUNE MARINA LST (9U North - CO)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  8-HR VALUES FOR SOURCE GROUP: 2
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ___________ ___________ ___________ _______ _______ _________ _________ _________
  365586.06300 3760379.25000     262.30814    0.00    8-HR  2          1ST          NA
  365561.40600 3760379.25000     340.71375    0.00    8-HR  2          1ST          NA
  365536.75000 3760379.50000     431.17932    0.00    8-HR  2          1ST          NA
  365512.09400 3760379.50000     551.98199    0.00    8-HR  2          1ST          NA
  365487.43800 3760379.75000     752.46014    0.00    8-HR  2          1ST          NA
  365462.78100 3760379.75000     900.79419    0.00    8-HR  2          1ST          NA
  365438.12500 3760380.00000     941.58044    0.00    8-HR  2          1ST          NA
  365413.46900 3760380.00000    1180.16614    0.00    8-HR  2          1ST          NA
  365388.81300 3760380.25000     837.97522    0.00    8-HR  2          1ST          NA
  365702.18800 3760360.75000      93.15195    0.00    8-HR  2          1ST          NA
  365744.90600 3760392.50000      76.58782    0.00    8-HR  2          1ST          NA
  365659.90600 3760353.75000     121.53552    0.00    8-HR  2          1ST          NA
  365635.25000 3760354.00000     146.27908    0.00    8-HR  2          1ST          NA
  365610.59400 3760354.00000     177.68420    0.00    8-HR  2          1ST          NA
  365585.93800 3760354.25000     229.29886    0.00    8-HR  2          1ST          NA
  365561.28100 3760354.25000     311.53650    0.00    8-HR  2          1ST          NA
  365536.62500 3760354.50000     434.04083    0.00    8-HR  2          1ST          NA
  365511.96900 3760354.50000     604.55505    0.00    8-HR  2          1ST          NA
  365487.31300 3760354.75000     799.63574    0.00    8-HR  2          1ST          NA
  365462.65600 3760354.75000    1216.04297    0.00    8-HR  2          1ST          NA
  365438.00000 3760355.00000    1434.96924    0.00    8-HR  2          1ST          NA
  365413.34400 3760355.00000    1749.63489    0.00    8-HR  2          1ST          NA
  365388.68800 3760355.25000    1395.33093    0.00    8-HR  2          1ST          NA
  365702.06300 3760335.75000      79.64790    0.00    8-HR  2          1ST          NA
  365737.28100 3760350.00000      70.38077    0.00    8-HR  2          1ST          NA
  365762.37500 3760374.75000      68.20056    0.00    8-HR  2          1ST          NA
  365777.40600 3760409.50000      65.21197    0.00    8-HR  2          1ST          NA
  365659.78100 3760328.75000     102.65754    0.00    8-HR  2          1ST          NA
  365635.12500 3760329.00000     126.81370    0.00    8-HR  2          1ST          NA
  365610.46900 3760329.00000     158.79420    0.00    8-HR  2          1ST          NA
  365585.81300 3760329.25000     202.96848    0.00    8-HR  2          1ST          NA
  365561.15600 3760329.25000     264.49051    0.00    8-HR  2          1ST          NA
  365536.50000 3760329.50000     356.24008    0.00    8-HR  2          1ST          NA
  365511.84400 3760329.50000     536.51379    0.00    8-HR  2          1ST          NA
  365487.18800 3760329.75000     849.21710    0.00    8-HR  2          1ST          NA
  365462.53100 3760329.75000    1349.98853    0.00    8-HR  2          1ST          NA
  365437.87500 3760330.00000    2255.64111    0.00    8-HR  2          1ST          NA
  365413.21900 3760330.00000    2561.44336    0.00    8-HR  2          1ST          NA
  365706.34400 3760312.50000      57.61398    0.00    8-HR  2          1ST          NA
  365728.34400 3760321.50000      56.29272    0.00    8-HR  2          1ST          NA
  365750.34400 3760330.50000      54.33002    0.00    8-HR  2          1ST          NA
  365781.75000 3760361.25000      57.87132    0.00    8-HR  2          1ST          NA
  365791.12500 3760383.00000      60.00515    0.00    8-HR  2          1ST          NA
  365800.53100 3760404.75000      58.99739    0.00    8-HR  2          1ST          NA
  365684.31300 3760303.75000      64.04974    0.00    8-HR  2          1ST          NA
  365659.65600 3760303.75000      75.05673    0.00    8-HR  2          1ST          NA
  365635.00000 3760304.00000      89.20891    0.00    8-HR  2          1ST          NA
  365610.34400 3760304.00000     110.99477    0.00    8-HR  2          1ST          NA
  365585.68800 3760304.25000     144.05643    0.00    8-HR  2          1ST          NA
  365561.03100 3760304.25000     191.39801    0.00    8-HR  2          1ST          NA
  365536.37500 3760304.50000     264.74088    0.00    8-HR  2          1ST          NA
  365511.71900 3760304.50000     380.91080    0.00    8-HR  2          1ST          NA
  365487.06300 3760304.75000     583.81171    0.00    8-HR  2          1ST          NA
  365462.40600 3760304.75000    1038.67615    0.00    8-HR  2          1ST          NA
  365437.75000 3760305.00000    2108.69287    0.00    8-HR  2          1ST          NA
  365705.34400 3760287.25000      53.77946    0.00    8-HR  2          1ST          NA
  365726.46900 3760295.75000      49.16139    0.00    8-HR  2          1ST          NA
  365747.59400 3760304.25000      44.88619    0.00    8-HR  2          1ST          NA
  365768.71900 3760313.00000      40.93233    0.00    8-HR  2          1ST          NA
  365798.87500 3760342.50000      45.74567    0.00    8-HR  2          1ST          NA
  365807.87500 3760363.25000      50.75601    0.00    8-HR  2          1ST          NA
  365816.87500 3760384.25000      53.04527    0.00    8-HR  2          1ST          NA
  365825.90600 3760405.25000      52.83806    0.00    8-HR  2          1ST          NA
  365684.18800 3760278.75000      58.87052    0.00    8-HR  2          1ST          NA
  365659.53100 3760278.75000      69.07081    0.00    8-HR  2          1ST          NA
  365634.87500 3760279.00000      82.34724    0.00    8-HR  2          1ST          NA
  365610.21900 3760279.00000      99.82339    0.00    8-HR  2          1ST          NA
  365585.56300 3760279.25000     123.91689    0.00    8-HR  2          1ST          NA
  365560.90600 3760279.25000     159.10826    0.00    8-HR  2          1ST          NA
  365536.25000 3760279.50000     210.40469    0.00    8-HR  2          1ST          NA
  365511.59400 3760279.50000     289.49881    0.00    8-HR  2          1ST          NA
  365486.93800 3760279.75000     417.63861    0.00    8-HR  2          1ST          NA
  365462.28100 3760279.75000     646.81714    0.00    8-HR  2          1ST          NA
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* ISCST3 (02035): NEPTUNE MARINA LST (9U North – NOx)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  1-HR VALUES FOR SOURCE GROUP: 2
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ___________ ___________ ___________ _______ _______ _________ _________ _________
  364863.37500 3760413.25000     331.85181     0.00    1-HR  2          1ST         NA
  364858.40600 3760448.50000     305.00964     0.00    1-HR  2          1ST         NA
  364845.40600 3760376.25000     229.49023     0.00    1-HR  2          1ST         NA
  364854.03100 3760344.50000     265.80103     0.00    1-HR  2          1ST         NA
  364862.62500 3760312.75000     350.24347     0.00    1-HR  2          1ST         NA
  364838.62500 3760409.75000     298.85834     0.00    1-HR  2          1ST         NA
  364833.65600 3760445.00000     300.18408     0.00    1-HR  2          1ST         NA
  364820.93800 3760371.75000     187.52313     0.00    1-HR  2          1ST         NA
  364830.06300 3760338.00000     274.02429     0.00    1-HR  2          1ST         NA
  364839.21900 3760304.25000     334.38580     0.00    1-HR  2          1ST         NA
  364813.87500 3760406.25000     264.35806     0.00    1-HR  2          1ST         NA
  364808.87500 3760441.50000     287.53391     0.00    1-HR  2          1ST         NA
  364795.75000 3760369.75000     174.26727     0.00    1-HR  2          1ST         NA
  364804.06300 3760339.25000     258.20392     0.00    1-HR  2          1ST         NA
  364812.34400 3760308.50000     309.59787     0.00    1-HR  2          1ST         NA
  364789.12500 3760402.75000     230.50047     0.00    1-HR  2          1ST         NA
  364784.12500 3760438.00000     269.30597     0.00    1-HR  2          1ST         NA
  364771.25000 3760365.50000     182.65610     0.00    1-HR  2          1ST         NA
  364780.00000 3760333.25000     258.62943     0.00    1-HR  2          1ST         NA
  364788.75000 3760300.75000     291.91003     0.00    1-HR  2          1ST         NA
  364764.37500 3760399.25000     198.68871     0.00    1-HR  2          1ST         NA
  364759.37500 3760434.50000     247.56319     0.00    1-HR  2          1ST         NA
  364746.71900 3760361.25000     188.48824     0.00    1-HR  2          1ST         NA
  364755.93800 3760327.00000     255.33076     0.00    1-HR  2          1ST         NA
  364765.15600 3760293.00000     271.01590     0.00    1-HR  2          1ST         NA
  364739.62500 3760395.75000     169.72264     0.00    1-HR  2          1ST         NA
  364734.62500 3760430.75000     223.78970     0.00    1-HR  2          1ST         NA
  365204.62500 3760522.50000     689.25922     0.00    1-HR  2          1ST         NA
  365179.68800 3760500.75000     679.99115     0.00    1-HR  2          1ST         NA
  365154.62500 3760522.25000     561.83264     0.00    1-HR  2          1ST         NA
  365129.62500 3760522.25000     390.69659     0.00    1-HR  2          1ST         NA
  365104.62500 3760522.00000     233.39017     0.00    1-HR  2          1ST         NA
  365079.62500 3760522.00000     251.33777     0.00    1-HR  2          1ST         NA
  365054.68800 3760500.50000     436.98187     0.00    1-HR  2          1ST         NA
  365029.68800 3760500.25000     458.08777     0.00    1-HR  2          1ST         NA
  365029.53100 3760543.50000     268.98938     0.00    1-HR  2          1ST         NA
  365004.68800 3760500.25000     447.00558     0.00    1-HR  2          1ST         NA
  364979.68800 3760500.25000     412.99814     0.00    1-HR  2          1ST         NA
  364979.53100 3760543.25000     344.89737     0.00    1-HR  2          1ST         NA
  364954.68800 3760500.00000     390.38507     0.00    1-HR  2          1ST         NA
  364929.68800 3760500.00000     366.03381     0.00    1-HR  2          1ST         NA
  364929.53100 3760543.00000     343.63925     0.00    1-HR  2          1ST         NA
  364905.75000 3760485.00000     319.04770     0.00    1-HR  2          1ST         NA
  364904.62500 3760521.50000     332.30862     0.00    1-HR  2          1ST         NA
  364880.84400 3760483.75000     271.54602     0.00    1-HR  2          1ST         NA
  364879.62500 3760521.25000     313.52393     0.00    1-HR  2          1ST         NA
  364855.93800 3760482.50000     225.49016     0.00    1-HR  2          1ST         NA
  364854.62500 3760521.25000     287.40097     0.00    1-HR  2          1ST         NA
  364831.00000 3760481.50000     229.42804     0.00    1-HR  2          1ST         NA
  364829.62500 3760521.25000     257.39001     0.00    1-HR  2          1ST         NA
  364806.09400 3760480.25000     236.65425     0.00    1-HR  2          1ST         NA
  364804.62500 3760521.00000     225.74847     0.00    1-HR  2          1ST         NA
  364781.18800 3760479.00000     238.95934     0.00    1-HR  2          1ST         NA
  364779.62500 3760521.00000     195.12212     0.00    1-HR  2          1ST         NA
  364755.87500 3760483.00000     230.42355     0.00    1-HR  2          1ST         NA
  364754.62500 3760521.00000     166.48428     0.00    1-HR  2          1ST         NA
  364730.93800 3760482.25000     226.60068     0.00    1-HR  2          1ST         NA
  364729.62500 3760520.75000     171.31174     0.00    1-HR  2          1ST         NA
  365237.15600 3760448.25000    1044.37769     0.00    1-HR  2          1ST         NA
  365250.87500 3760414.75000    1175.27234     0.00    1-HR  2          1ST         NA
  365273.87500 3760369.75000    1409.95520     0.00    1-HR  2          1ST         NA
  365333.75000 3760269.00000    4424.51318     0.00    1-HR  2          1ST         NA
  365372.15600 3760209.50000    2089.41089     0.00    1-HR  2          1ST         NA
  365477.31300 3760208.00000    1031.02136     0.00    1-HR  2          1ST         NA
  365477.31300 3760244.75000    1316.78235     0.00    1-HR  2          1ST         NA
  365457.78100 3760244.75000    1511.56799     0.00    1-HR  2          1ST         NA
  365339.75000 3760430.50000     791.97186     0.00    1-HR  2          1ST         NA
  365684.93800 3760428.75000     248.38300     0.00    1-HR  2          1ST         NA
  365685.68800 3760473.25000     226.03903     0.00    1-HR  2          1ST         NA
  365435.59400 3760475.00000     554.84094     0.00    1-HR  2          1ST         NA
  365435.65600 3760543.75000     358.36710     0.00    1-HR  2          1ST         NA
  365229.53100 3760544.00000     393.48740     0.00    1-HR  2          1ST         NA
  365229.68800 3760501.00000     739.74878     0.00    1-HR  2          1ST         NA
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* ISCST3 (02035): NEPTUNE MARINA LST (9U North – PM10)
* MODELING OPTIONS USED:
*  CONC        DDEP        URBAN FLAT  FLGPOL TOXICS                      NOCALM                ARDPLT
*         PLOT FILE OF  HIGH 1ST  HIGH 24-HR VALUES FOR SOURCE GROUP: 2
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (4(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC      DRY DEPO   ZELEV     AVE     GRP       HIVAL    NET ID
*
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X	Y	AVERAGE CONC	DRY DEPO	ZELEV	AVE	GRP	HIVAL	NET ID
365610.71900	3760379.00000	2.33224	0.00231	0.00	24-HR	2	1ST	NA
365586.06300	3760379.25000	3.04482	0.00284	0.00	24-HR	2	1ST	NA
365561.40600	3760379.25000	3.97646	0.00345	0.00	24-HR	2	1ST	NA
365536.75000	3760379.50000	5.06994	0.00426	0.00	24-HR	2	1ST	NA
365512.09400	3760379.50000	6.52586	0.00694	0.00	24-HR	2	1ST	NA
365487.43800	3760379.75000	9.02590	0.01045	0.00	24-HR	2	1ST	NA
365462.78100	3760379.75000	10.78477	0.01271	0.00	24-HR	2	1ST	NA
365438.12500	3760380.00000	11.22063	0.01118	0.00	24-HR	2	1ST	NA
365413.46900	3760380.00000	14.92254	0.00846	0.00	24-HR	2	1ST	NA
365388.81300	3760380.25000	11.63655	0.00816	0.00	24-HR	2	1ST	NA
365702.18800	3760360.75000	1.04708	0.00120	0.00	24-HR	2	1ST	NA
365744.90600	3760392.50000	0.87021	0.00099	0.00	24-HR	2	1ST	NA
365659.90600	3760353.75000	1.36966	0.00159	0.00	24-HR	2	1ST	NA
365635.25000	3760354.00000	1.65718	0.00194	0.00	24-HR	2	1ST	NA
365610.59400	3760354.00000	2.02561	0.00237	0.00	24-HR	2	1ST	NA
365585.93800	3760354.25000	2.64393	0.00293	0.00	24-HR	2	1ST	NA
365561.28100	3760354.25000	3.61675	0.00374	0.00	24-HR	2	1ST	NA
365536.62500	3760354.50000	5.07687	0.00495	0.00	24-HR	2	1ST	NA
365511.96900	3760354.50000	7.11154	0.00642	0.00	24-HR	2	1ST	NA
365487.31300	3760354.75000	9.50321	0.00991	0.00	24-HR	2	1ST	NA
365462.65600	3760354.75000	14.43540	0.01714	0.00	24-HR	2	1ST	NA
365438.00000	3760355.00000	17.96679	0.02114	0.00	24-HR	2	1ST	NA
365413.34400	3760355.00000	22.11521	0.01727	0.00	24-HR	2	1ST	NA
365388.68800	3760355.25000	19.88309	0.01426	0.00	24-HR	2	1ST	NA
365702.06300	3760335.75000	0.88113	0.00111	0.00	24-HR	2	1ST	NA
365737.28100	3760350.00000	0.78228	0.00093	0.00	24-HR	2	1ST	NA
365762.37500	3760374.75000	0.76593	0.00086	0.00	24-HR	2	1ST	NA
365777.40600	3760409.50000	0.74273	0.00084	0.00	24-HR	2	1ST	NA
365659.78100	3760328.75000	1.13660	0.00143	0.00	24-HR	2	1ST	NA
365635.12500	3760329.00000	1.40974	0.00170	0.00	24-HR	2	1ST	NA
365610.46900	3760329.00000	1.77333	0.00213	0.00	24-HR	2	1ST	NA
365585.81300	3760329.25000	2.27877	0.00275	0.00	24-HR	2	1ST	NA
365561.15600	3760329.25000	2.99466	0.00362	0.00	24-HR	2	1ST	NA
365536.50000	3760329.50000	4.11374	0.00488	0.00	24-HR	2	1ST	NA
365511.84400	3760329.50000	6.27476	0.00687	0.00	24-HR	2	1ST	NA
365487.18800	3760329.75000	10.03968	0.01031	0.00	24-HR	2	1ST	NA
365462.53100	3760329.75000	16.03640	0.01527	0.00	24-HR	2	1ST	NA
365437.87500	3760330.00000	26.65717	0.03263	0.00	24-HR	2	1ST	NA
365413.21900	3760330.00000	33.03356	0.04021	0.00	24-HR	2	1ST	NA
365706.34400	3760312.50000	0.67477	0.00094	0.00	24-HR	2	1ST	NA
365728.34400	3760321.50000	0.61544	0.00088	0.00	24-HR	2	1ST	NA
365750.34400	3760330.50000	0.59617	0.00082	0.00	24-HR	2	1ST	NA
365781.75000	3760361.25000	0.64396	0.00075	0.00	24-HR	2	1ST	NA
365791.12500	3760383.00000	0.67413	0.00075	0.00	24-HR	2	1ST	NA
365800.53100	3760404.75000	0.66837	0.00075	0.00	24-HR	2	1ST	NA
365684.31300	3760303.75000	0.76015	0.00109	0.00	24-HR	2	1ST	NA
365659.65600	3760303.75000	0.89219	0.00130	0.00	24-HR	2	1ST	NA
365635.00000	3760304.00000	1.06245	0.00159	0.00	24-HR	2	1ST	NA
365610.34400	3760304.00000	1.28608	0.00197	0.00	24-HR	2	1ST	NA
365585.68800	3760304.25000	1.59106	0.00250	0.00	24-HR	2	1ST	NA
365561.03100	3760304.25000	2.13191	0.00325	0.00	24-HR	2	1ST	NA
365536.37500	3760304.50000	2.98742	0.00436	0.00	24-HR	2	1ST	NA
365511.71900	3760304.50000	4.36877	0.00607	0.00	24-HR	2	1ST	NA
365487.06300	3760304.75000	6.84054	0.00903	0.00	24-HR	2	1ST	NA
365462.40600	3760304.75000	13.01573	0.01515	0.00	24-HR	2	1ST	NA
365437.75000	3760305.00000	27.00747	0.03058	0.00	24-HR	2	1ST	NA
365705.34400	3760287.25000	0.63475	0.00093	0.00	24-HR	2	1ST	NA
365726.46900	3760295.75000	0.58087	0.00082	0.00	24-HR	2	1ST	NA
365747.59400	3760304.25000	0.53125	0.00073	0.00	24-HR	2	1ST	NA
365768.71900	3760313.00000	0.48552	0.00066	0.00	24-HR	2	1ST	NA
365798.87500	3760342.50000	0.50334	0.00067	0.00	24-HR	2	1ST	NA
365807.87500	3760363.25000	0.56393	0.00067	0.00	24-HR	2	1ST	NA
365816.87500	3760384.25000	0.59445	0.00066	0.00	24-HR	2	1ST	NA
365825.90600	3760405.25000	0.59658	0.00066	0.00	24-HR	2	1ST	NA
365684.18800	3760278.75000	0.71252	0.00107	0.00	24-HR	2	1ST	NA
365659.53100	3760278.75000	0.84585	0.00128	0.00	24-HR	2	1ST	NA
365634.87500	3760279.00000	1.01719	0.00156	0.00	24-HR	2	1ST	NA
365610.21900	3760279.00000	1.24678	0.00193	0.00	24-HR	2	1ST	NA
365585.56300	3760279.25000	1.55824	0.00245	0.00	24-HR	2	1ST	NA
365560.90600	3760279.25000	2.00078	0.00318	0.00	24-HR	2	1ST	NA
365536.25000	3760279.50000	2.64622	0.00426	0.00	24-HR	2	1ST	NA
365511.59400	3760279.50000	3.64263	0.00589	0.00	24-HR	2	1ST	NA
365486.93800	3760279.75000	5.26322	0.00882	0.00	24-HR	2	1ST	NA

```
* ISCST3 (02035): NEPTUNE MARINA LST (10R – CO)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  1-HR VALUES FOR SOURCE GROUP: 1
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ___________ ___________ ___________ _______ _______ _________ _________ ________
  364863.37500 3760413.25000     539.11639     0.00    1-HR  1          1ST        NA
  364858.40600 3760448.50000     351.73083     0.00    1-HR  1          1ST        NA
  364845.40600 3760376.25000     529.80444     0.00    1-HR  1          1ST        NA
  364854.03100 3760344.50000     562.96838     0.00    1-HR  1          1ST        NA
  364862.62500 3760312.75000     493.13806     0.00    1-HR  1          1ST        NA
  364838.62500 3760409.75000     515.89752     0.00    1-HR  1          1ST        NA
  364833.65600 3760445.00000     344.22626     0.00    1-HR  1          1ST        NA
  364820.93800 3760371.75000     478.06940     0.00    1-HR  1          1ST        NA
  364830.06300 3760338.00000     519.23309     0.00    1-HR  1          1ST        NA
  364839.21900 3760304.25000     476.93408     0.00    1-HR  1          1ST        NA
  364813.87500 3760406.25000     490.22781     0.00    1-HR  1          1ST        NA
  364808.87500 3760441.50000     352.66324     0.00    1-HR  1          1ST        NA
  364795.75000 3760369.75000     444.97144     0.00    1-HR  1          1ST        NA
  364804.06300 3760339.25000     483.47705     0.00    1-HR  1          1ST        NA
  364812.34400 3760308.50000     413.77429     0.00    1-HR  1          1ST        NA
  364789.12500 3760402.75000     463.36859     0.00    1-HR  1          1ST        NA
  364784.12500 3760438.00000     355.96808     0.00    1-HR  1          1ST        NA
  364771.25000 3760365.50000     424.24933     0.00    1-HR  1          1ST        NA
  364780.00000 3760333.25000     448.40521     0.00    1-HR  1          1ST        NA
  364788.75000 3760300.75000     398.40591     0.00    1-HR  1          1ST        NA
  364764.37500 3760399.25000     436.24341     0.00    1-HR  1          1ST        NA
  364759.37500 3760434.50000     354.98572     0.00    1-HR  1          1ST        NA
  364746.71900 3760361.25000     403.67880     0.00    1-HR  1          1ST        NA
  364755.93800 3760327.00000     414.95929     0.00    1-HR  1          1ST        NA
  364765.15600 3760293.00000     384.94772     0.00    1-HR  1          1ST        NA
  364739.62500 3760395.75000     409.50635     0.00    1-HR  1          1ST        NA
  364734.62500 3760430.75000     351.26883     0.00    1-HR  1          1ST        NA
  365204.62500 3760522.50000    1826.62891     0.00    1-HR  1          1ST        NA
  365179.68800 3760500.75000    1219.25806     0.00    1-HR  1          1ST        NA
  365154.62500 3760522.25000     870.50922     0.00    1-HR  1          1ST        NA
  365129.62500 3760522.25000     929.42285     0.00    1-HR  1          1ST        NA
  365104.62500 3760522.00000    1134.78906     0.00    1-HR  1          1ST        NA
  365079.62500 3760522.00000    1170.47461     0.00    1-HR  1          1ST        NA
  365054.68800 3760500.50000    1124.46375     0.00    1-HR  1          1ST        NA
  365029.68800 3760500.25000     942.60773     0.00    1-HR  1          1ST        NA
  365029.53100 3760543.50000     928.75092     0.00    1-HR  1          1ST        NA
  365004.68800 3760500.25000     751.21423     0.00    1-HR  1          1ST        NA
  364979.68800 3760500.25000     671.62817     0.00    1-HR  1          1ST        NA
  364979.53100 3760543.25000     777.85474     0.00    1-HR  1          1ST        NA
  364954.68800 3760500.00000     677.94324     0.00    1-HR  1          1ST        NA
  364929.68800 3760500.00000     660.93616     0.00    1-HR  1          1ST        NA
  364929.53100 3760543.00000     597.18134     0.00    1-HR  1          1ST        NA
  364905.75000 3760485.00000     646.58282     0.00    1-HR  1          1ST        NA
  364904.62500 3760521.50000     530.43274     0.00    1-HR  1          1ST        NA
  364880.84400 3760483.75000     581.06580     0.00    1-HR  1          1ST        NA
  364879.62500 3760521.25000     529.15411     0.00    1-HR  1          1ST        NA
  364855.93800 3760482.50000     515.27234     0.00    1-HR  1          1ST        NA
  364854.62500 3760521.25000     514.96088     0.00    1-HR  1          1ST        NA
  364831.00000 3760481.50000     453.33698     0.00    1-HR  1          1ST        NA
  364829.62500 3760521.25000     492.62363     0.00    1-HR  1          1ST        NA
  364806.09400 3760480.25000     395.50049     0.00    1-HR  1          1ST        NA
  364804.62500 3760521.00000     465.10971     0.00    1-HR  1          1ST        NA
  364781.18800 3760479.00000     343.34787     0.00    1-HR  1          1ST        NA
  364779.62500 3760521.00000     434.19528     0.00    1-HR  1          1ST        NA
  364755.87500 3760483.00000     315.36331     0.00    1-HR  1          1ST        NA
  364754.62500 3760521.00000     402.03986     0.00    1-HR  1          1ST        NA
  364730.93800 3760482.25000     275.59317     0.00    1-HR  1          1ST        NA
  364729.62500 3760520.75000     369.59738     0.00    1-HR  1          1ST        NA
  365237.15600 3760448.25000    2809.26660     0.00    1-HR  1          1ST        NA
  365250.87500 3760414.75000    4570.22949     0.00    1-HR  1          1ST        NA
  365273.87500 3760369.75000    4318.92041     0.00    1-HR  1          1ST        NA
  365333.75000 3760269.00000    1524.51038     0.00    1-HR  1          1ST        NA
  365372.15600 3760209.50000    1172.06616     0.00    1-HR  1          1ST        NA
  365477.31300 3760208.00000     650.25421     0.00    1-HR  1          1ST        NA
  365477.31300 3760244.75000     835.24280     0.00    1-HR  1          1ST        NA
  365457.78100 3760244.75000     952.16772     0.00    1-HR  1          1ST        NA
  365339.75000 3760430.50000    2338.48145     0.00    1-HR  1          1ST        NA
  365684.93800 3760428.75000     303.53522     0.00    1-HR  1          1ST        NA
  365685.68800 3760473.25000     285.66217     0.00    1-HR  1          1ST        NA
  365435.59400 3760475.00000    1060.57788     0.00    1-HR  1          1ST        NA
  365435.65600 3760543.75000     687.27435     0.00    1-HR  1          1ST        NA
  365229.53100 3760544.00000    1068.36621     0.00    1-HR  1          1ST        NA
  365229.68800 3760501.00000    2098.53271     0.00    1-HR  1          1ST        NA
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* ISCST3 (02035): NEPTUNE MARINA LST (10R – CO)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  8-HR VALUES FOR SOURCE GROUP: 1
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ____________ ____________ ____________ _______ _______ ________ ________ ________
  365926.56300 3760847.25000      35.24367    0.00    8-HR  1        1ST        NA
  365886.96900 3760864.25000      38.13354    0.00    8-HR  1        1ST        NA
  365847.37500 3760881.00000      38.87831    0.00    8-HR  1        1ST        NA
  365807.78100 3760897.75000      44.14227    0.00    8-HR  1        1ST        NA
  366160.25000 3760443.00000      10.57856    0.00    8-HR  1        1ST        NA
  366177.71900 3760484.75000      12.41392    0.00    8-HR  1        1ST        NA
  366161.90600 3760524.50000      15.62597    0.00    8-HR  1        1ST        NA
  366146.12500 3760564.25000      17.90668    0.00    8-HR  1        1ST        NA
  366130.31300 3760604.00000      18.91266    0.00    8-HR  1        1ST        NA
  366114.53100 3760643.75000      18.79452    0.00    8-HR  1        1ST        NA
  366098.71900 3760683.50000      19.80833    0.00    8-HR  1        1ST        NA
  366082.90600 3760723.25000      22.96162    0.00    8-HR  1        1ST        NA
  366067.12500 3760763.00000      26.28472    0.00    8-HR  1        1ST        NA
  366051.31300 3760802.75000      28.50894    0.00    8-HR  1        1ST        NA
  366023.71900 3760831.00000      29.57804    0.00    8-HR  1        1ST        NA
  365984.37500 3760847.75000      29.56383    0.00    8-HR  1        1ST        NA
  365945.00000 3760864.50000      33.33132    0.00    8-HR  1        1ST        NA
  365905.65600 3760881.25000      35.88133    0.00    8-HR  1        1ST        NA
  365866.28100 3760898.00000      36.53273    0.00    8-HR  1        1ST        NA
  365826.93800 3760914.75000      41.34517    0.00    8-HR  1        1ST        NA
  365787.56300 3760931.50000      43.09368    0.00    8-HR  1        1ST        NA
  365748.21900 3760948.25000      40.49119    0.00    8-HR  1        1ST        NA
  366185.25000 3760442.75000      10.02386    0.00    8-HR  1        1ST        NA
  366184.87500 3760420.25000       9.88877    0.00    8-HR  1        1ST        NA
  365684.81300 3760403.75000      51.83984    0.00    8-HR  1        1ST        NA
  365660.15600 3760403.75000      61.63687    0.00    8-HR  1        1ST        NA
  365635.50000 3760404.00000      74.44418    0.00    8-HR  1        1ST        NA
  365610.84400 3760404.00000      90.83018    0.00    8-HR  1        1ST        NA
  365586.18800 3760404.25000     112.91996    0.00    8-HR  1        1ST        NA
  365561.53100 3760404.25000     142.37250    0.00    8-HR  1        1ST        NA
  365536.87500 3760404.50000     183.63284    0.00    8-HR  1        1ST        NA
  365512.21900 3760404.50000     241.54184    0.00    8-HR  1        1ST        NA
  365487.56300 3760404.75000     329.91873    0.00    8-HR  1        1ST        NA
  365462.90600 3760404.75000     495.15530    0.00    8-HR  1        1ST        NA
  365438.25000 3760405.00000     753.33075    0.00    8-HR  1        1ST        NA
  365413.59400 3760405.00000    1116.18005    0.00    8-HR  1        1ST        NA
  365388.93800 3760405.25000    1571.35938    0.00    8-HR  1        1ST        NA
  365364.28100 3760405.25000    2316.15576    0.00    8-HR  1        1ST        NA
  365702.31300 3760385.75000      44.69850    0.00    8-HR  1        1ST        NA
  365660.03100 3760378.75000      55.10277    0.00    8-HR  1        1ST        NA
  365635.37500 3760379.00000      63.94729    0.00    8-HR  1        1ST        NA
  365610.71900 3760379.00000      75.07267    0.00    8-HR  1        1ST        NA
  365586.06300 3760379.25000      89.48114    0.00    8-HR  1        1ST        NA
  365561.40600 3760379.25000     108.42971    0.00    8-HR  1        1ST        NA
  365536.75000 3760379.50000     134.22406    0.00    8-HR  1        1ST        NA
  365512.09400 3760379.50000     170.40648    0.00    8-HR  1        1ST        NA
  365487.43800 3760379.75000     225.52846    0.00    8-HR  1        1ST        NA
  365462.78100 3760379.75000     332.03329    0.00    8-HR  1        1ST        NA
  365438.12500 3760380.00000     550.93640    0.00    8-HR  1        1ST        NA
  365413.46900 3760380.00000     996.08569    0.00    8-HR  1        1ST        NA
  365388.81300 3760380.25000    1650.71741    0.00    8-HR  1        1ST        NA
  365702.18800 3760360.75000      41.03546    0.00    8-HR  1        1ST        NA
  365744.90600 3760392.50000      36.95529    0.00    8-HR  1        1ST        NA
  365659.90600 3760353.75000      54.95913    0.00    8-HR  1        1ST        NA
  365635.25000 3760354.00000      64.20445    0.00    8-HR  1        1ST        NA
  365610.59400 3760354.00000      76.03219    0.00    8-HR  1        1ST        NA
  365585.93800 3760354.25000      91.15808    0.00    8-HR  1        1ST        NA
  365561.28100 3760354.25000     111.25553    0.00    8-HR  1        1ST        NA
  365536.62500 3760354.50000     138.21324    0.00    8-HR  1        1ST        NA
  365511.96900 3760354.50000     175.95058    0.00    8-HR  1        1ST        NA
  365487.31300 3760354.75000     230.25090    0.00    8-HR  1        1ST        NA
  365462.65600 3760354.75000     312.84250    0.00    8-HR  1        1ST        NA
  365438.00000 3760355.00000     447.28210    0.00    8-HR  1        1ST        NA
  365413.34400 3760355.00000     704.77496    0.00    8-HR  1        1ST        NA
  365388.68800 3760355.25000    1371.95044    0.00    8-HR  1        1ST        NA
  365702.06300 3760335.75000      47.27759    0.00    8-HR  1        1ST        NA
  365737.28100 3760350.00000      36.55563    0.00    8-HR  1        1ST        NA
  365762.37500 3760374.75000      32.47125    0.00    8-HR  1        1ST        NA
  365777.40600 3760409.50000      32.73713    0.00    8-HR  1        1ST        NA
  365659.78100 3760328.75000      61.36956    0.00    8-HR  1        1ST        NA
  365635.12500 3760329.00000      71.15560    0.00    8-HR  1        1ST        NA
  365610.46900 3760329.00000      83.25289    0.00    8-HR  1        1ST        NA
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* ISCST3 (02035): NEPTUNE MARINA LST (10R – NOx)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  1-HR VALUES FOR SOURCE GROUP: 1
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ___________ ___________ ___________ _______ _______ _________ _________ ________
  364863.37500 3760413.25000     389.85690     0.00    1-HR  1          1ST        NA
  364858.40600 3760448.50000     254.35080     0.00    1-HR  1          1ST        NA
  364845.40600 3760376.25000     383.12305     0.00    1-HR  1          1ST        NA
  364854.03100 3760344.50000     407.10529     0.00    1-HR  1          1ST        NA
  364862.62500 3760312.75000     356.60809     0.00    1-HR  1          1ST        NA
  364838.62500 3760409.75000     373.06641     0.00    1-HR  1          1ST        NA
  364833.65600 3760445.00000     248.92395     0.00    1-HR  1          1ST        NA
  364820.93800 3760371.75000     345.71136     0.00    1-HR  1          1ST        NA
  364830.06300 3760338.00000     375.47852     0.00    1-HR  1          1ST        NA
  364839.21900 3760304.25000     344.89035     0.00    1-HR  1          1ST        NA
  364813.87500 3760406.25000     354.50357     0.00    1-HR  1          1ST        NA
  364808.87500 3760441.50000     255.02509     0.00    1-HR  1          1ST        NA
  364795.75000 3760369.75000     321.77682     0.00    1-HR  1          1ST        NA
  364804.06300 3760339.25000     349.62183     0.00    1-HR  1          1ST        NA
  364812.34400 3760308.50000     299.21695     0.00    1-HR  1          1ST        NA
  364789.12500 3760402.75000     335.08054     0.00    1-HR  1          1ST        NA
  364784.12500 3760438.00000     257.41492     0.00    1-HR  1          1ST        NA
  364771.25000 3760365.50000     306.79187     0.00    1-HR  1          1ST        NA
  364780.00000 3760333.25000     324.26004     0.00    1-HR  1          1ST        NA
  364788.75000 3760300.75000     288.10349     0.00    1-HR  1          1ST        NA
  364764.37500 3760399.25000     315.46530     0.00    1-HR  1          1ST        NA
  364759.37500 3760434.50000     256.70453     0.00    1-HR  1          1ST        NA
  364746.71900 3760361.25000     291.91650     0.00    1-HR  1          1ST        NA
  364755.93800 3760327.00000     300.07388     0.00    1-HR  1          1ST        NA
  364765.15600 3760293.00000     278.37128     0.00    1-HR  1          1ST        NA
  364739.62500 3760395.75000     296.13062     0.00    1-HR  1          1ST        NA
  364734.62500 3760430.75000     254.01671     0.00    1-HR  1          1ST        NA
  365204.62500 3760522.50000    1320.90955     0.00    1-HR  1          1ST        NA
  365179.68800 3760500.75000     881.69489     0.00    1-HR  1          1ST        NA
  365154.62500 3760522.25000     629.50043     0.00    1-HR  1          1ST        NA
  365129.62500 3760522.25000     672.10327     0.00    1-HR  1          1ST        NA
  365104.62500 3760522.00000     820.61200     0.00    1-HR  1          1ST        NA
  365079.62500 3760522.00000     846.41754     0.00    1-HR  1          1ST        NA
  365054.68800 3760500.50000     813.14520     0.00    1-HR  1          1ST        NA
  365029.68800 3760500.25000     681.63788     0.00    1-HR  1          1ST        NA
  365029.53100 3760543.50000     671.61731     0.00    1-HR  1          1ST        NA
  365004.68800 3760500.25000     543.23346     0.00    1-HR  1          1ST        NA
  364979.68800 3760500.25000     485.68149     0.00    1-HR  1          1ST        NA
  364979.53100 3760543.25000     562.49829     0.00    1-HR  1          1ST        NA
  364954.68800 3760500.00000     490.24820     0.00    1-HR  1          1ST        NA
  364929.68800 3760500.00000     477.94968     0.00    1-HR  1          1ST        NA
  364929.53100 3760543.00000     431.84598     0.00    1-HR  1          1ST        NA
  364905.75000 3760485.00000     467.57016     0.00    1-HR  1          1ST        NA
  364904.62500 3760521.50000     383.57736     0.00    1-HR  1          1ST        NA
  364880.84400 3760483.75000     420.19226     0.00    1-HR  1          1ST        NA
  364879.62500 3760521.25000     382.65274     0.00    1-HR  1          1ST        NA
  364855.93800 3760482.50000     372.61429     0.00    1-HR  1          1ST        NA
  364854.62500 3760521.25000     372.38910     0.00    1-HR  1          1ST        NA
  364831.00000 3760481.50000     327.82626     0.00    1-HR  1          1ST        NA
  364829.62500 3760521.25000     356.23605     0.00    1-HR  1          1ST        NA
  364806.09400 3760480.25000     286.00244     0.00    1-HR  1          1ST        NA
  364804.62500 3760521.00000     336.33966     0.00    1-HR  1          1ST        NA
  364781.18800 3760479.00000     248.28876     0.00    1-HR  1          1ST        NA
  364779.62500 3760521.00000     313.98419     0.00    1-HR  1          1ST        NA
  364755.87500 3760483.00000     228.05199     0.00    1-HR  1          1ST        NA
  364754.62500 3760521.00000     290.73129     0.00    1-HR  1          1ST        NA
  364730.93800 3760482.25000     199.29257     0.00    1-HR  1          1ST        NA
  364729.62500 3760520.75000     267.27084     0.00    1-HR  1          1ST        NA
  365237.15600 3760448.25000    2031.49426     0.00    1-HR  1          1ST        NA
  365250.87500 3760414.75000    3304.91772     0.00    1-HR  1          1ST        NA
  365273.87500 3760369.75000    3123.18628     0.00    1-HR  1          1ST        NA
  365333.75000 3760269.00000    1102.43518     0.00    1-HR  1          1ST        NA
  365372.15600 3760209.50000     847.56848     0.00    1-HR  1          1ST        NA
  365477.31300 3760208.00000     470.22516     0.00    1-HR  1          1ST        NA
  365477.31300 3760244.75000     603.99786     0.00    1-HR  1          1ST        NA
  365457.78100 3760244.75000     688.55103     0.00    1-HR  1          1ST        NA
  365339.75000 3760430.50000    1691.05066     0.00    1-HR  1          1ST        NA
  365684.93800 3760428.75000     219.49860     0.00    1-HR  1          1ST        NA
  365685.68800 3760473.25000     206.57388     0.00    1-HR  1          1ST        NA
  365435.59400 3760475.00000     766.94684     0.00    1-HR  1          1ST        NA
  365435.65600 3760543.75000     496.99588     0.00    1-HR  1          1ST        NA
  365229.53100 3760544.00000     772.57880     0.00    1-HR  1          1ST        NA
  365229.68800 3760501.00000    1517.53394     0.00    1-HR  1          1ST        NA
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* ISCST3 (02035): NEPTUNE MARINA LST (10R – PM10)
* MODELING OPTIONS USED:
*  CONC        DDEP        URBAN FLAT  FLGPOL TOXICS                      NOCALM                ARDPLT
*         PLOT FILE OF  HIGH 1ST  HIGH 24-HR VALUES FOR SOURCE GROUP: 3
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (4(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC      DRY DEPO   ZELEV     AVE     GRP       HIVAL    NET ID
*
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X	Y	AVERAGE CONC	DRY DEPO	ZELEV	AVE	GRP	HIVAL	NET ID
364863.37500	3760413.25000	3.78163	0.00486	0.00	24-HR	3	1ST	NA
364858.40600	3760448.50000	3.81145	0.00481	0.00	24-HR	3	1ST	NA
364845.40600	3760376.25000	3.39437	0.00403	0.00	24-HR	3	1ST	NA
364854.03100	3760344.50000	3.07358	0.00335	0.00	24-HR	3	1ST	NA
364862.62500	3760312.75000	3.05646	0.00252	0.00	24-HR	3	1ST	NA
364838.62500	3760409.75000	3.53507	0.00445	0.00	24-HR	3	1ST	NA
364833.65600	3760445.00000	3.52812	0.00445	0.00	24-HR	3	1ST	NA
364820.93800	3760371.75000	3.14461	0.00367	0.00	24-HR	3	1ST	NA
364830.06300	3760338.00000	2.90249	0.00301	0.00	24-HR	3	1ST	NA
364839.21900	3760304.25000	2.83699	0.00222	0.00	24-HR	3	1ST	NA
364813.87500	3760406.25000	3.31675	0.00407	0.00	24-HR	3	1ST	NA
364808.87500	3760441.50000	3.27388	0.00412	0.00	24-HR	3	1ST	NA
364795.75000	3760369.75000	2.94945	0.00338	0.00	24-HR	3	1ST	NA
364804.06300	3760339.25000	2.66636	0.00287	0.00	24-HR	3	1ST	NA
364812.34400	3760308.50000	2.75460	0.00224	0.00	24-HR	3	1ST	NA
364789.12500	3760402.75000	3.11361	0.00374	0.00	24-HR	3	1ST	NA
364784.12500	3760438.00000	3.03833	0.00382	0.00	24-HR	3	1ST	NA
364771.25000	3760365.50000	2.74578	0.00311	0.00	24-HR	3	1ST	NA
364780.00000	3760333.25000	2.52650	0.00260	0.00	24-HR	3	1ST	NA
364788.75000	3760300.75000	2.58029	0.00201	0.00	24-HR	3	1ST	NA
364764.37500	3760399.25000	2.92877	0.00345	0.00	24-HR	3	1ST	NA
364759.37500	3760434.50000	2.82014	0.00354	0.00	24-HR	3	1ST	NA
364746.71900	3760361.25000	2.56014	0.00286	0.00	24-HR	3	1ST	NA
364755.93800	3760327.00000	2.39812	0.00237	0.00	24-HR	3	1ST	NA
364765.15600	3760293.00000	2.41770	0.00181	0.00	24-HR	3	1ST	NA
364739.62500	3760395.75000	2.75912	0.00318	0.00	24-HR	3	1ST	NA
364734.62500	3760430.75000	2.61731	0.00329	0.00	24-HR	3	1ST	NA
365204.62500	3760522.50000	13.87575	0.01657	0.00	24-HR	3	1ST	NA
365179.68800	3760500.75000	17.95048	0.01858	0.00	24-HR	3	1ST	NA
365154.62500	3760522.25000	12.92626	0.01370	0.00	24-HR	3	1ST	NA
365129.62500	3760522.25000	12.29586	0.01274	0.00	24-HR	3	1ST	NA
365104.62500	3760522.00000	11.35432	0.01151	0.00	24-HR	3	1ST	NA
365079.62500	3760522.00000	10.32235	0.01024	0.00	24-HR	3	1ST	NA
365054.68800	3760500.50000	9.45623	0.01005	0.00	24-HR	3	1ST	NA
365029.68800	3760500.25000	8.31794	0.00899	0.00	24-HR	3	1ST	NA
365029.53100	3760543.50000	7.72511	0.00773	0.00	24-HR	3	1ST	NA
365004.68800	3760500.25000	7.35944	0.00805	0.00	24-HR	3	1ST	NA
364979.68800	3760500.25000	6.52098	0.00723	0.00	24-HR	3	1ST	NA
364979.53100	3760543.25000	6.69114	0.00627	0.00	24-HR	3	1ST	NA
364954.68800	3760500.00000	5.78742	0.00647	0.00	24-HR	3	1ST	NA
364929.68800	3760500.00000	5.14280	0.00578	0.00	24-HR	3	1ST	NA
364929.53100	3760543.00000	5.69386	0.00534	0.00	24-HR	3	1ST	NA
364905.75000	3760485.00000	4.45656	0.00513	0.00	24-HR	3	1ST	NA
364904.62500	3760521.50000	5.03647	0.00521	0.00	24-HR	3	1ST	NA
364880.84400	3760483.75000	4.02176	0.00462	0.00	24-HR	3	1ST	NA
364879.62500	3760521.25000	4.54659	0.00476	0.00	24-HR	3	1ST	NA
364855.93800	3760482.50000	3.64255	0.00431	0.00	24-HR	3	1ST	NA
364854.62500	3760521.25000	4.10492	0.00436	0.00	24-HR	3	1ST	NA
364831.00000	3760481.50000	3.34978	0.00401	0.00	24-HR	3	1ST	NA
364829.62500	3760521.25000	3.70621	0.00400	0.00	24-HR	3	1ST	NA
364806.09400	3760480.25000	3.16509	0.00375	0.00	24-HR	3	1ST	NA
364804.62500	3760521.00000	3.34604	0.00368	0.00	24-HR	3	1ST	NA
364781.18800	3760479.00000	2.99302	0.00351	0.00	24-HR	3	1ST	NA
364779.62500	3760521.00000	3.02650	0.00340	0.00	24-HR	3	1ST	NA
364755.87500	3760483.00000	2.78146	0.00323	0.00	24-HR	3	1ST	NA
364754.62500	3760521.00000	2.74021	0.00314	0.00	24-HR	3	1ST	NA
364730.93800	3760482.25000	2.63837	0.00303	0.00	24-HR	3	1ST	NA
364729.62500	3760520.75000	2.51188	0.00291	0.00	24-HR	3	1ST	NA
365237.15600	3760448.25000	59.07581	0.07770	0.00	24-HR	3	1ST	NA
365250.87500	3760414.75000	54.86435	0.07271	0.00	24-HR	3	1ST	NA
365273.87500	3760369.75000	46.57106	0.06471	0.00	24-HR	3	1ST	NA
365333.75000	3760269.00000	7.76567	0.01605	0.00	24-HR	3	1ST	NA
365372.15600	3760209.50000	4.07429	0.01025	0.00	24-HR	3	1ST	NA
365477.31300	3760208.00000	2.94689	0.00732	0.00	24-HR	3	1ST	NA
365477.31300	3760244.75000	3.52694	0.00775	0.00	24-HR	3	1ST	NA
365457.78100	3760244.75000	3.69041	0.00911	0.00	24-HR	3	1ST	NA
365339.75000	3760430.50000	59.35270	0.08493	0.00	24-HR	3	1ST	NA
365684.93800	3760428.75000	20.09937	0.06700	0.00	24-HR	3	1ST	NA
365685.68800	3760473.25000	50.89553	0.06649	0.00	24-HR	3	1ST	NA
365435.59400	3760475.00000	71.78912	0.08876	0.00	24-HR	3	1ST	NA
365435.65600	3760543.75000	19.96693	0.02007	0.00	24-HR	3	1ST	NA
365229.53100	3760544.00000	11.71964	0.01310	0.00	24-HR	3	1ST	NA
365229.68800	3760501.00000	20.33796	0.02709	0.00	24-HR	3	1ST	NA

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* ISCST3 (02035): NEPTUNE MARINA LST (FF – CO)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  1-HR VALUES FOR SOURCE GROUP: 1
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ___________ ___________  ____________  ______  ______  ________  ________  ________
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X	Y	AVERAGE CONC	ZELEV	AVE	GRP	HIVAL	NET ID
364863.37500	3760413.25000	473.69171	0.00	1-HR	1	1ST	NA
364858.40600	3760448.50000	552.53021	0.00	1-HR	1	1ST	NA
364845.40600	3760376.25000	255.14268	0.00	1-HR	1	1ST	NA
364854.03100	3760344.50000	309.01044	0.00	1-HR	1	1ST	NA
364862.62500	3760312.75000	450.07919	0.00	1-HR	1	1ST	NA
364838.62500	3760409.75000	446.41879	0.00	1-HR	1	1ST	NA
364833.65600	3760445.00000	504.64349	0.00	1-HR	1	1ST	NA
364820.93800	3760371.75000	250.18472	0.00	1-HR	1	1ST	NA
364830.06300	3760338.00000	265.87030	0.00	1-HR	1	1ST	NA
364839.21900	3760304.25000	407.52194	0.00	1-HR	1	1ST	NA
364813.87500	3760406.25000	420.66486	0.00	1-HR	1	1ST	NA
364808.87500	3760441.50000	462.96381	0.00	1-HR	1	1ST	NA
364795.75000	3760369.75000	256.46329	0.00	1-HR	1	1ST	NA
364804.06300	3760339.25000	195.62759	0.00	1-HR	1	1ST	NA
364812.34400	3760308.50000	327.82324	0.00	1-HR	1	1ST	NA
364789.12500	3760402.75000	396.52606	0.00	1-HR	1	1ST	NA
364784.12500	3760438.00000	426.56256	0.00	1-HR	1	1ST	NA
364771.25000	3760365.50000	249.95555	0.00	1-HR	1	1ST	NA
364780.00000	3760333.25000	167.49277	0.00	1-HR	1	1ST	NA
364788.75000	3760300.75000	293.76257	0.00	1-HR	1	1ST	NA
364764.37500	3760399.25000	374.01385	0.00	1-HR	1	1ST	NA
364759.37500	3760434.50000	394.53842	0.00	1-HR	1	1ST	NA
364746.71900	3760361.25000	243.04800	0.00	1-HR	1	1ST	NA
364755.93800	3760327.00000	144.81418	0.00	1-HR	1	1ST	NA
364765.15600	3760293.00000	264.03564	0.00	1-HR	1	1ST	NA
364739.62500	3760395.75000	353.08685	0.00	1-HR	1	1ST	NA
364734.62500	3760430.75000	366.52789	0.00	1-HR	1	1ST	NA
365204.62500	3760522.50000	4499.96680	0.00	1-HR	1	1ST	NA
365179.68800	3760500.75000	3723.71899	0.00	1-HR	1	1ST	NA
365154.62500	3760522.25000	3061.59375	0.00	1-HR	1	1ST	NA
365129.62500	3760522.25000	2468.31128	0.00	1-HR	1	1ST	NA
365104.62500	3760522.00000	2011.19666	0.00	1-HR	1	1ST	NA
365079.62500	3760522.00000	1670.01550	0.00	1-HR	1	1ST	NA
365054.68800	3760500.50000	1404.06030	0.00	1-HR	1	1ST	NA
365029.68800	3760500.25000	1225.83582	0.00	1-HR	1	1ST	NA
365029.53100	3760543.50000	1195.31909	0.00	1-HR	1	1ST	NA
365004.68800	3760500.25000	1079.00879	0.00	1-HR	1	1ST	NA
364979.68800	3760500.25000	955.38397	0.00	1-HR	1	1ST	NA
364979.53100	3760543.25000	939.51703	0.00	1-HR	1	1ST	NA
364954.68800	3760500.00000	850.40234	0.00	1-HR	1	1ST	NA
364929.68800	3760500.00000	762.09967	0.00	1-HR	1	1ST	NA
364929.53100	3760543.00000	755.21948	0.00	1-HR	1	1ST	NA
364905.75000	3760485.00000	642.98419	0.00	1-HR	1	1ST	NA
364904.62500	3760521.50000	642.90631	0.00	1-HR	1	1ST	NA
364880.84400	3760483.75000	587.03308	0.00	1-HR	1	1ST	NA
364879.62500	3760521.25000	580.93573	0.00	1-HR	1	1ST	NA
364855.93800	3760482.50000	538.38489	0.00	1-HR	1	1ST	NA
364854.62500	3760521.25000	527.68982	0.00	1-HR	1	1ST	NA
364831.00000	3760481.50000	496.55762	0.00	1-HR	1	1ST	NA
364829.62500	3760521.25000	482.25552	0.00	1-HR	1	1ST	NA
364806.09400	3760480.25000	459.03036	0.00	1-HR	1	1ST	NA
364804.62500	3760521.00000	443.07330	0.00	1-HR	1	1ST	NA
364781.18800	3760479.00000	425.87088	0.00	1-HR	1	1ST	NA
364779.62500	3760521.00000	408.38812	0.00	1-HR	1	1ST	NA
364755.87500	3760483.00000	403.92551	0.00	1-HR	1	1ST	NA
364754.62500	3760521.00000	378.00229	0.00	1-HR	1	1ST	NA
364730.93800	3760482.25000	376.99734	0.00	1-HR	1	1ST	NA
364729.62500	3760520.75000	351.61972	0.00	1-HR	1	1ST	NA
365237.15600	3760448.25000	1416.76013	0.00	1-HR	1	1ST	NA
365250.87500	3760414.75000	1068.01770	0.00	1-HR	1	1ST	NA
365273.87500	3760369.75000	804.44849	0.00	1-HR	1	1ST	NA
365333.75000	3760269.00000	400.85260	0.00	1-HR	1	1ST	NA
365372.15600	3760209.50000	268.54163	0.00	1-HR	1	1ST	NA
365477.31300	3760208.00000	557.70544	0.00	1-HR	1	1ST	NA
365477.31300	3760244.75000	489.85645	0.00	1-HR	1	1ST	NA
365457.78100	3760244.75000	646.72192	0.00	1-HR	1	1ST	NA
365339.75000	3760430.50000	2066.18018	0.00	1-HR	1	1ST	NA
365684.93800	3760428.75000	203.97397	0.00	1-HR	1	1ST	NA
365685.68800	3760473.25000	208.96613	0.00	1-HR	1	1ST	NA
365435.59400	3760475.00000	1059.57568	0.00	1-HR	1	1ST	NA
365435.65600	3760543.75000	1168.75305	0.00	1-HR	1	1ST	NA
365229.53100	3760544.00000	4647.39893	0.00	1-HR	1	1ST	NA
365229.68800	3760501.00000	4290.61182	0.00	1-HR	1	1ST	NA

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* ISCST3 (02035): NEPTUNE MARINA LST (FF – CO)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  8-HR VALUES FOR SOURCE GROUP: 2
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ___________ ___________  ___________  _______  _______  _________  _________  _________
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X	Y	AVERAGE CONC	ZELEV	AVE	GRP	HIVAL	NET ID
364863.37500	3760413.25000	50.07579	0.00	8-HR	2	1ST	NA
364858.40600	3760448.50000	45.51431	0.00	8-HR	2	1ST	NA
364845.40600	3760376.25000	37.25027	0.00	8-HR	2	1ST	NA
364854.03100	3760344.50000	28.49540	0.00	8-HR	2	1ST	NA
364862.62500	3760312.75000	32.88287	0.00	8-HR	2	1ST	NA
364838.62500	3760409.75000	46.80596	0.00	8-HR	2	1ST	NA
364833.65600	3760445.00000	42.27644	0.00	8-HR	2	1ST	NA
364820.93800	3760371.75000	35.49254	0.00	8-HR	2	1ST	NA
364830.06300	3760338.00000	25.98922	0.00	8-HR	2	1ST	NA
364839.21900	3760304.25000	30.25317	0.00	8-HR	2	1ST	NA
364813.87500	3760406.25000	43.84835	0.00	8-HR	2	1ST	NA
364808.87500	3760441.50000	39.39561	0.00	8-HR	2	1ST	NA
364795.75000	3760369.75000	34.66870	0.00	8-HR	2	1ST	NA
364804.06300	3760339.25000	23.12722	0.00	8-HR	2	1ST	NA
364812.34400	3760308.50000	26.65702	0.00	8-HR	2	1ST	NA
364789.12500	3760402.75000	41.16693	0.00	8-HR	2	1ST	NA
364784.12500	3760438.00000	36.82851	0.00	8-HR	2	1ST	NA
364771.25000	3760365.50000	33.10107	0.00	8-HR	2	1ST	NA
364780.00000	3760333.25000	22.11172	0.00	8-HR	2	1ST	NA
364788.75000	3760300.75000	24.62623	0.00	8-HR	2	1ST	NA
364764.37500	3760399.25000	38.73009	0.00	8-HR	2	1ST	NA
364759.37500	3760434.50000	34.52624	0.00	8-HR	2	1ST	NA
364746.71900	3760361.25000	31.62823	0.00	8-HR	2	1ST	NA
364755.93800	3760327.00000	21.08095	0.00	8-HR	2	1ST	NA
364765.15600	3760293.00000	22.82001	0.00	8-HR	2	1ST	NA
364739.62500	3760395.75000	36.51020	0.00	8-HR	2	1ST	NA
364734.62500	3760430.75000	32.50700	0.00	8-HR	2	1ST	NA
365204.62500	3760522.50000	333.81546	0.00	8-HR	2	1ST	NA
365179.68800	3760500.75000	250.11516	0.00	8-HR	2	1ST	NA
365154.62500	3760522.25000	219.08325	0.00	8-HR	2	1ST	NA
365129.62500	3760522.25000	185.63326	0.00	8-HR	2	1ST	NA
365104.62500	3760522.00000	159.19493	0.00	8-HR	2	1ST	NA
365079.62500	3760522.00000	138.49304	0.00	8-HR	2	1ST	NA
365054.68800	3760500.50000	124.21780	0.00	8-HR	2	1ST	NA
365029.68800	3760500.25000	110.58460	0.00	8-HR	2	1ST	NA
365029.53100	3760543.50000	112.98888	0.00	8-HR	2	1ST	NA
365004.68800	3760500.25000	99.13186	0.00	8-HR	2	1ST	NA
364979.68800	3760500.25000	89.38889	0.00	8-HR	2	1ST	NA
364979.53100	3760543.25000	91.83602	0.00	8-HR	2	1ST	NA
364954.68800	3760500.00000	81.05302	0.00	8-HR	2	1ST	NA
364929.68800	3760500.00000	73.85500	0.00	8-HR	2	1ST	NA
364929.53100	3760543.00000	76.24747	0.00	8-HR	2	1ST	NA
364905.75000	3760485.00000	66.87311	0.00	8-HR	2	1ST	NA
364904.62500	3760521.50000	65.58382	0.00	8-HR	2	1ST	NA
364880.84400	3760483.75000	61.71185	0.00	8-HR	2	1ST	NA
364879.62500	3760521.25000	60.25632	0.00	8-HR	2	1ST	NA
364855.93800	3760482.50000	57.16819	0.00	8-HR	2	1ST	NA
364854.62500	3760521.25000	55.67929	0.00	8-HR	2	1ST	NA
364831.00000	3760481.50000	53.17465	0.00	8-HR	2	1ST	NA
364829.62500	3760521.25000	51.64359	0.00	8-HR	2	1ST	NA
364806.09400	3760480.25000	49.59147	0.00	8-HR	2	1ST	NA
364804.62500	3760521.00000	47.99687	0.00	8-HR	2	1ST	NA
364781.18800	3760479.00000	46.38847	0.00	8-HR	2	1ST	NA
364779.62500	3760521.00000	44.81429	0.00	8-HR	2	1ST	NA
364755.87500	3760483.00000	43.78209	0.00	8-HR	2	1ST	NA
364754.62500	3760521.00000	41.96439	0.00	8-HR	2	1ST	NA
364730.93800	3760482.25000	41.16129	0.00	8-HR	2	1ST	NA
364729.62500	3760520.75000	39.34906	0.00	8-HR	2	1ST	NA
365237.15600	3760448.25000	306.62326	0.00	8-HR	2	1ST	NA
365250.87500	3760414.75000	154.01474	0.00	8-HR	2	1ST	NA
365273.87500	3760369.75000	77.09329	0.00	8-HR	2	1ST	NA
365333.75000	3760269.00000	58.35909	0.00	8-HR	2	1ST	NA
365372.15600	3760209.50000	56.35120	0.00	8-HR	2	1ST	NA
365477.31300	3760208.00000	38.70030	0.00	8-HR	2	1ST	NA
365477.31300	3760244.75000	58.84301	0.00	8-HR	2	1ST	NA
365457.78100	3760244.75000	46.02392	0.00	8-HR	2	1ST	NA
365339.75000	3760430.50000	185.29131	0.00	8-HR	2	1ST	NA
365684.93800	3760428.75000	45.88923	0.00	8-HR	2	1ST	NA
365685.68800	3760473.25000	63.17511	0.00	8-HR	2	1ST	NA
365435.59400	3760475.00000	473.33130	0.00	8-HR	2	1ST	NA
365435.65600	3760543.75000	2455.91382	0.00	8-HR	2	1ST	NA
365229.53100	3760544.00000	524.24432	0.00	8-HR	2	1ST	NA
365229.68800	3760501.00000	356.10019	0.00	8-HR	2	1ST	NA

```
* ISCST3 (02035): NEPTUNE MARINA LST (FF – NOx)
* MODELING OPTIONS USED:
*  CONC                    URBAN FLAT  FLGPOL                              NOCALM
*         PLOT FILE OF  HIGH 1ST  HIGH  1-HR VALUES FOR SOURCE GROUP: 1
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (3(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC   ZELEV     AVE     GRP       HIVAL    NET ID
*  ___________ ___________  ___________  _______  _______  _________  _________  _________
  364863.37500 3760413.25000     355.76013     0.00    1-HR  1          1ST          NA
  364858.40600 3760448.50000     414.97079     0.00    1-HR  1          1ST          NA
  364845.40600 3760376.25000     191.62170     0.00    1-HR  1          1ST          NA
  364854.03100 3760344.50000     232.07835     0.00    1-HR  1          1ST          NA
  364862.62500 3760312.75000     338.02628     0.00    1-HR  1          1ST          NA
  364838.62500 3760409.75000     335.27722     0.00    1-HR  1          1ST          NA
  364833.65600 3760445.00000     379.00613     0.00    1-HR  1          1ST          NA
  364820.93800 3760371.75000     187.89809     0.00    1-HR  1          1ST          NA
  364830.06300 3760338.00000     199.67851     0.00    1-HR  1          1ST          NA
  364839.21900 3760304.25000     306.06421     0.00    1-HR  1          1ST          NA
  364813.87500 3760406.25000     315.93500     0.00    1-HR  1          1ST          NA
  364808.87500 3760441.50000     347.70309     0.00    1-HR  1          1ST          NA
  364795.75000 3760369.75000     192.61353     0.00    1-HR  1          1ST          NA
  364804.06300 3760339.25000     146.92363     0.00    1-HR  1          1ST          NA
  364812.34400 3760308.50000     246.20749     0.00    1-HR  1          1ST          NA
  364789.12500 3760402.75000     297.80585     0.00    1-HR  1          1ST          NA
  364784.12500 3760438.00000     320.36438     0.00    1-HR  1          1ST          NA
  364771.25000 3760365.50000     187.72595     0.00    1-HR  1          1ST          NA
  364780.00000 3760333.25000     125.79332     0.00    1-HR  1          1ST          NA
  364788.75000 3760300.75000     220.62668     0.00    1-HR  1          1ST          NA
  364764.37500 3760399.25000     280.89835     0.00    1-HR  1          1ST          NA
  364759.37500 3760434.50000     296.31308     0.00    1-HR  1          1ST          NA
  364746.71900 3760361.25000     182.53812     0.00    1-HR  1          1ST          NA
  364755.93800 3760327.00000     108.76086     0.00    1-HR  1          1ST          NA
  364765.15600 3760293.00000     198.30063     0.00    1-HR  1          1ST          NA
  364739.62500 3760395.75000     265.18143     0.00    1-HR  1          1ST          NA
  364734.62500 3760430.75000     275.27612     0.00    1-HR  1          1ST          NA
  365204.62500 3760522.50000    3379.64307     0.00    1-HR  1          1ST          NA
  365179.68800 3760500.75000    2796.65186     0.00    1-HR  1          1ST          NA
  365154.62500 3760522.25000    2299.37134     0.00    1-HR  1          1ST          NA
  365129.62500 3760522.25000    1853.79407     0.00    1-HR  1          1ST          NA
  365104.62500 3760522.00000    1510.48389     0.00    1-HR  1          1ST          NA
  365079.62500 3760522.00000    1254.24390     0.00    1-HR  1          1ST          NA
  365054.68800 3760500.50000    1054.50171     0.00    1-HR  1          1ST          NA
  365029.68800 3760500.25000     920.64850     0.00    1-HR  1          1ST          NA
  365029.53100 3760543.50000     897.72931     0.00    1-HR  1          1ST          NA
  365004.68800 3760500.25000     810.37592     0.00    1-HR  1          1ST          NA
  364979.68800 3760500.25000     717.52911     0.00    1-HR  1          1ST          NA
  364979.53100 3760543.25000     705.61230     0.00    1-HR  1          1ST          NA
  364954.68800 3760500.00000     638.68396     0.00    1-HR  1          1ST          NA
  364929.68800 3760500.00000     572.36530     0.00    1-HR  1          1ST          NA
  364929.53100 3760543.00000     567.19806     0.00    1-HR  1          1ST          NA
  364905.75000 3760485.00000     482.90515     0.00    1-HR  1          1ST          NA
  364904.62500 3760521.50000     482.84665     0.00    1-HR  1          1ST          NA
  364880.84400 3760483.75000     440.88376     0.00    1-HR  1          1ST          NA
  364879.62500 3760521.25000     436.30444     0.00    1-HR  1          1ST          NA
  364855.93800 3760482.50000     404.34717     0.00    1-HR  1          1ST          NA
  364854.62500 3760521.25000     396.31473     0.00    1-HR  1          1ST          NA
  364831.00000 3760481.50000     372.93332     0.00    1-HR  1          1ST          NA
  364829.62500 3760521.25000     362.19193     0.00    1-HR  1          1ST          NA
  364806.09400 3760480.25000     344.74896     0.00    1-HR  1          1ST          NA
  364804.62500 3760521.00000     332.76459     0.00    1-HR  1          1ST          NA
  364781.18800 3760479.00000     319.84494     0.00    1-HR  1          1ST          NA
  364779.62500 3760521.00000     306.71472     0.00    1-HR  1          1ST          NA
  364755.87500 3760483.00000     303.36316     0.00    1-HR  1          1ST          NA
  364754.62500 3760521.00000     283.89383     0.00    1-HR  1          1ST          NA
  364730.93800 3760482.25000     283.13910     0.00    1-HR  1          1ST          NA
  364729.62500 3760520.75000     264.07953     0.00    1-HR  1          1ST          NA
  365237.15600 3760448.25000    1064.03967     0.00    1-HR  1          1ST          NA
  365250.87500 3760414.75000     802.12109     0.00    1-HR  1          1ST          NA
  365273.87500 3760369.75000     604.17090     0.00    1-HR  1          1ST          NA
  365333.75000 3760269.00000     301.05530     0.00    1-HR  1          1ST          NA
  365372.15600 3760209.50000     201.68481     0.00    1-HR  1          1ST          NA
  365477.31300 3760208.00000     418.85764     0.00    1-HR  1          1ST          NA
  365477.31300 3760244.75000     367.90045     0.00    1-HR  1          1ST          NA
  365457.78100 3760244.75000     485.71234     0.00    1-HR  1          1ST          NA
  365339.75000 3760430.50000    1551.77844     0.00    1-HR  1          1ST          NA
  365684.93800 3760428.75000     153.19206     0.00    1-HR  1          1ST          NA
  365685.68800 3760473.25000     156.94138     0.00    1-HR  1          1ST          NA
  365435.59400 3760475.00000     795.78088     0.00    1-HR  1          1ST          NA
  365435.65600 3760543.75000     877.77728     0.00    1-HR  1          1ST          NA
  365229.53100 3760544.00000    3490.37012     0.00    1-HR  1          1ST          NA
  365229.68800 3760501.00000    3222.41016     0.00    1-HR  1          1ST          NA
```

```
* ISCST3 (02035): NEPTUNE MARINA LST (FF – PM10)
* MODELING OPTIONS USED:
*  CONC        DDEP        URBAN FLAT  FLGPOL TOXICS                      NOCALM                ARDPLT
*         PLOT FILE OF  HIGH 1ST  HIGH 24-HR VALUES FOR SOURCE GROUP: 2
*         FOR A TOTAL OF  1899 RECEPTORS.
*         FORMAT: (4(1X,F13.5),1X,F8.2,3X,A5,2X,A8,2X,A4,6X,A8)
*        X             Y      AVERAGE CONC      DRY DEPO   ZELEV     AVE     GRP       HIVAL    NET ID
*
```

X	Y	AVERAGE CONC	DRY DEPO	ZELEV	AVE	GRP	HIVAL	NET ID
364863.37500	3760413.25000	0.72714	0.00054	0.00	24-HR	2	1ST	NA
364858.40600	3760448.50000	0.71473	0.00077	0.00	24-HR	2	1ST	NA
364845.40600	3760376.25000	0.48620	0.00032	0.00	24-HR	2	1ST	NA
364854.03100	3760344.50000	0.47580	0.00032	0.00	24-HR	2	1ST	NA
364862.62500	3760312.75000	0.52761	0.00036	0.00	24-HR	2	1ST	NA
364838.62500	3760409.75000	0.67832	0.00050	0.00	24-HR	2	1ST	NA
364833.65600	3760445.00000	0.65611	0.00071	0.00	24-HR	2	1ST	NA
364820.93800	3760371.75000	0.46607	0.00030	0.00	24-HR	2	1ST	NA
364830.06300	3760338.00000	0.43075	0.00028	0.00	24-HR	2	1ST	NA
364839.21900	3760304.25000	0.48321	0.00033	0.00	24-HR	2	1ST	NA
364813.87500	3760406.25000	0.63453	0.00047	0.00	24-HR	2	1ST	NA
364808.87500	3760441.50000	0.60568	0.00065	0.00	24-HR	2	1ST	NA
364795.75000	3760369.75000	0.46014	0.00029	0.00	24-HR	2	1ST	NA
364804.06300	3760339.25000	0.37605	0.00025	0.00	24-HR	2	1ST	NA
364812.34400	3760308.50000	0.43037	0.00029	0.00	24-HR	2	1ST	NA
364789.12500	3760402.75000	0.59399	0.00043	0.00	24-HR	2	1ST	NA
364784.12500	3760438.00000	0.56071	0.00060	0.00	24-HR	2	1ST	NA
364771.25000	3760365.50000	0.44052	0.00028	0.00	24-HR	2	1ST	NA
364780.00000	3760333.25000	0.34253	0.00022	0.00	24-HR	2	1ST	NA
364788.75000	3760300.75000	0.39567	0.00026	0.00	24-HR	2	1ST	NA
364764.37500	3760399.25000	0.55711	0.00041	0.00	24-HR	2	1ST	NA
364759.37500	3760434.50000	0.52092	0.00055	0.00	24-HR	2	1ST	NA
364746.71900	3760361.25000	0.42217	0.00026	0.00	24-HR	2	1ST	NA
364755.93800	3760327.00000	0.31342	0.00021	0.00	24-HR	2	1ST	NA
364765.15600	3760293.00000	0.36493	0.00024	0.00	24-HR	2	1ST	NA
364739.62500	3760395.75000	0.52380	0.00038	0.00	24-HR	2	1ST	NA
364734.62500	3760430.75000	0.48671	0.00051	0.00	24-HR	2	1ST	NA
365204.62500	3760522.50000	10.77225	0.01643	0.00	24-HR	2	1ST	NA
365179.68800	3760500.75000	5.33300	0.00751	0.00	24-HR	2	1ST	NA
365154.62500	3760522.25000	4.68331	0.00710	0.00	24-HR	2	1ST	NA
365129.62500	3760522.25000	3.72713	0.00526	0.00	24-HR	2	1ST	NA
365104.62500	3760522.00000	3.03838	0.00409	0.00	24-HR	2	1ST	NA
365079.62500	3760522.00000	2.53730	0.00334	0.00	24-HR	2	1ST	NA
365054.68800	3760500.50000	2.18104	0.00257	0.00	24-HR	2	1ST	NA
365029.68800	3760500.25000	1.90024	0.00224	0.00	24-HR	2	1ST	NA
365029.53100	3760543.50000	1.91665	0.00232	0.00	24-HR	2	1ST	NA
365004.68800	3760500.25000	1.66895	0.00196	0.00	24-HR	2	1ST	NA
364979.68800	3760500.25000	1.47909	0.00175	0.00	24-HR	2	1ST	NA
364979.53100	3760543.25000	1.50341	0.00181	0.00	24-HR	2	1ST	NA
364954.68800	3760500.00000	1.31867	0.00156	0.00	24-HR	2	1ST	NA
364929.68800	3760500.00000	1.18458	0.00141	0.00	24-HR	2	1ST	NA
364929.53100	3760543.00000	1.21260	0.00145	0.00	24-HR	2	1ST	NA
364905.75000	3760485.00000	1.04049	0.00119	0.00	24-HR	2	1ST	NA
364904.62500	3760521.50000	1.02869	0.00134	0.00	24-HR	2	1ST	NA
364880.84400	3760483.75000	0.95079	0.00108	0.00	24-HR	2	1ST	NA
364879.62500	3760521.25000	0.93364	0.00121	0.00	24-HR	2	1ST	NA
364855.93800	3760482.50000	0.87190	0.00098	0.00	24-HR	2	1ST	NA
364854.62500	3760521.25000	0.85292	0.00109	0.00	24-HR	2	1ST	NA
364831.00000	3760481.50000	0.80373	0.00090	0.00	24-HR	2	1ST	NA
364829.62500	3760521.25000	0.78273	0.00100	0.00	24-HR	2	1ST	NA
364806.09400	3760480.25000	0.74376	0.00082	0.00	24-HR	2	1ST	NA
364804.62500	3760521.00000	0.72092	0.00092	0.00	24-HR	2	1ST	NA
364781.18800	3760479.00000	0.69037	0.00076	0.00	24-HR	2	1ST	NA
364779.62500	3760521.00000	0.66720	0.00084	0.00	24-HR	2	1ST	NA
364755.87500	3760483.00000	0.64895	0.00071	0.00	24-HR	2	1ST	NA
364754.62500	3760521.00000	0.61979	0.00078	0.00	24-HR	2	1ST	NA
364730.93800	3760482.25000	0.60625	0.00066	0.00	24-HR	2	1ST	NA
364729.62500	3760520.75000	0.57724	0.00072	0.00	24-HR	2	1ST	NA
365237.15600	3760448.25000	4.27408	0.00294	0.00	24-HR	2	1ST	NA
365250.87500	3760414.75000	1.99958	0.00136	0.00	24-HR	2	1ST	NA
365273.87500	3760369.75000	0.90676	0.00070	0.00	24-HR	2	1ST	NA
365333.75000	3760269.00000	0.84303	0.00059	0.00	24-HR	2	1ST	NA
365372.15600	3760209.50000	0.71380	0.00066	0.00	24-HR	2	1ST	NA
365477.31300	3760208.00000	0.59963	0.00147	0.00	24-HR	2	1ST	NA
365477.31300	3760244.75000	0.81085	0.00185	0.00	24-HR	2	1ST	NA
365457.78100	3760244.75000	0.65516	0.00178	0.00	24-HR	2	1ST	NA
365339.75000	3760430.50000	2.62097	0.00371	0.00	24-HR	2	1ST	NA
365684.93800	3760428.75000	0.65023	0.00176	0.00	24-HR	2	1ST	NA
365685.68800	3760473.25000	0.86508	0.00135	0.00	24-HR	2	1ST	NA
365435.59400	3760475.00000	6.21537	0.01809	0.00	24-HR	2	1ST	NA
365435.65600	3760543.75000	36.05822	0.04324	0.00	24-HR	2	1ST	NA
365229.53100	3760544.00000	16.70150	0.02306	0.00	24-HR	2	1ST	NA
365229.68800	3760501.00000	12.54091	0.01482	0.00	24-HR	2	1ST	NA

APPENDIX 5.5

Biota

MEMORANDUM

GLENN LUKOS ASSOCIATES

Regulatory Services

PROJECT NUMBER: 06680001P9U

TO: Andi Culbertson

FROM: Tony Bomkamp

DATE: June 20, 2006

SUBJECT: Occurrences of Seaside Heliotrope (*Heliotropum curassavicum*) at Parcel 9U, Marina del Rey, California

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During testimony provided by Mr. Robert "Roy" Van de Hoek at the DCB meeting on May 18, 2006, Mr. Van de Hoek asserted that the presence of Seaside Heliotrope (heliotrope) on Parcel 9U represented potential wetland locations. Mr. Van de Hoek's assertion was based on his review of the GLA biological technical report, Appendix C, which includes a list of plant species that are associated with the upland portions of the site. Heliotrope is included on the list, which consists almost entirely of upland species. While it was noted on upland portions of the site, it was not detected within the wetland area during the previous surveys outlined in the Biological Technical Report or Jurisdictional Delineation.

While GLA noted the heliotrope onsite during the earlier surveys efforts, it was not specifically addressed in the jurisdictional delineation because it was only observed growing on the upland portions of the site, which clearly lacked wetland hydrology and hydric soils. Furthermore, as observed during the original surveys and as further documented below, the heliotrope was observed growing among a predominance of upland non-native grasses and forbs and as such did not satisfy the "predominance" test (addressed below) for wetland vegetation. It is also important to note that on a similar nearby site (Playa Vista/Lincoln Boulevard) Coastal Commission Staff Biologist Dr. John Dixon examined an area, which as described in the Coastal Commission staff report[1] (Appendix A) exhibited very similar conditions wherein heliotrope was observed growing with upland species including the same species observed at Parcel 9U (e.g., *Chrysanthemum coronarium*, UPL). Dr. Dixon determined that the predominant vegetative characteristic of the Lincoln Boulevard site is upland even with the presence of heliotrope. Footnote 5 of the same staff report also noted that Dr. Dixon believes that the heliotrope is misclassified in the *U.S. Fish and Wildlife Service National List of Plant Species that Occur in Wetlands, Region 0 – California* and agreed with Mr. Wayne Ferren of the U.C. Santa Barbara Herbarium that it should be reclassified from its current status of Obligate Wetland plant (OBL)

[1] California Coastal Commission. January 18, 2003. Staff Report for Application Number 5-01-450. See page 11 for discussion of seaside heliotrope.

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(Plants that have a 99-percent occurrence rate in wetlands) to Facultative Wetland Plant (FAC), which are plants that exhibit equal likelihood of occurring in uplands and wetlands.

Given these factors, GLA biologists did not find that it was warranted at the time the jurisdictional delineation was conducted to collect additional data on the heliotrope in the upland areas as there was no potential for these areas to meet any of the three wetland criteria (i.e., wetland hydrology, predominance of hydrophytic vegetation, and/or predominance of hydric soils).

Nevertheless, in order to respond to the assertions of Mr. Van de Hoek at the DCB hearing, GLA biologists Tony Bomkamp and Alexis Kessans conducted site visits on June 2 and 15, 2006 to collect additional data on the vegetation within the upland portions of the site where heliotrope was observed. The data collected during the June 2 and 15, 2006 visits will be incorporated into an updated version of the jurisdictional delineation report and is summarized below.

During the June 2 site visit, as I was finishing my field work, Mr. Van de Hoek joined me at the site (apparently he was driving by and saw me so he decided it would be a good opportunity to discuss my findings). We reviewed many of the points where I collected the vegetation data and discussed the methods employed and results of the field work.

Methods

GLA biologist sampled 12 locations [depicted on attached exhibit] where Seaside Heliotrope (*Heliotropum curassavicum*, OBL) (heliotrope) was determined to be one of the dominant species within an otherwise upland vegetation matrix.[2] Observations were also recorded relative to the presence of indicators for wetland hydrology at each location. Soil pits were excavated at six of the locations. Vegetation sampling for predominance was performed using the standard 50/20 rule set forth in the updated Corps 1987 Manual. At the 12 representative locations where heliotrope was determined to be a dominant species, a five-foot radius was measured from the center of the heliotrope patch and dominant species within the five-foot-radius circle plot were recorded on the data sheet. Non-dominant species (i.e., those that exhibited less than 20-percent cover) were also recorded for informational purposes.

[2] GLA continues to use the "official" indicator status of OBL for the heliotrope because the status has not been changed in the *U.S. Fish and Wildlife Service National List of Plant Species that Occur in Wetlands, Region 0 – California*, though we fully concur with the recommended status change by Dr. Dixon and by Wayne Ferren which is cited in Footnote 5 of the above-cited coastal commission staff report. For the 12 data points observed, the proposed change would not affect the wetland determination in either direction when using the stand predominance test.

Results

None of the 12 locations sampled exhibited wetland hydrology.

None of the 6 locations sampled for hydric soils exhibited hydric soil indicators.

11 of the 12 locations sampled exhibited a predominance of upland vegetation.

One of the 12 locations exhibited a predominance of species with an indicator status of FAC or wetter; however, this area was considered to by upland based on a FAC-Neutral test that resulted in a determination of upland plant community.[3] Table 1 summarizes the results of the vegetation sampling.

TABLE 1: SUMMARY OF VEGETATION SAMPLING

Plot I.D.	Species/Status	Percent Indicator Species Present	FAC-Neutral Results	Wetland/Upland Status
A	Heliotrope (OBL) Ripgut (UPL) Garland Chrysanthemum (UPL)	33%	Upland	Upland
B	Heliotrope (OBL) Ripgut (UPL) Garland Chrysanthemum (UPL)	33%	Upland	Upland
C	Heliotrope (OBL) Ripgut (UPL) Telegraph weed (UPL)	33%	Upland	Upland
D	Heliotrope (OBL) Ripgut (UPL)	50%	Upland	Upland
E	Heliotrope (OBL) Ripgut (UPL)	50%	Upland	Upland
F	Heliotrope (OBL)	50%	Upland	Upland

[3] The FAC-Neutral test is a method described in the Corps' 1987 Manual that excludes FAC species and then compares species that are FACW or OBL with species that are FACU or UPL (FAC- and FAC+ species are considered FAC for this test). Where the number of FACW or OBL species **exceeds** the number of FACU or OBL species, the area is considered to exhibit a predominance of wetland plants and where the FACU or UPL species equal or exceed the FACW or OBL species, the area is considered upland. The test is also used as a secondary indictor for the presence of wetland hydrology, on the theory that sites that exhibit a number of FACW or OBL species and few if any upland species likely exhibit wetland hydrology (by inference, sites that do not exhibit a predominance of FACW or OBL species but rather exhibit mostly UPL species lack wetland hydrology). It is also important to note that use of the inappropriate OBL status for heliotrope still results in a finding that all of the areas where heliotrope was detected are upland. Use of the more accurate FAC status, only strengthens the conclusion that the subject areas are upland.

	Ripgut (UPL)			
G	Heliotrope (OBL) Ripgut (UPL)	50%	Upland	Upland
H	Heliotrope (OBL) Ripgut (UPL)	50%	Upland	Upland
I	Heliotrope (OBL) Ripgut (UPL)	50%	Upland	Upland
J	Heliotrope (OBL) Ripgut (UPL)	50%	Upland	Upland
K	Heliotrope (OBL) Ripgut (UPL) Bermuda Grass (FAC)	66%	Upland	Upland
L	Heliotrope (OBL) Ripgut (UPL)	50%	Upland	Upland

Discussion

The portion of the site evaluated for potential wetland conditions, based on the presence of heliotrope consists of an upland area dominated by non-native grasses and forbs including ripgut (*Bromus diandrus*, UPL), garland chrysanthemum (*Chrysanthemum coronarium*, UPL), slender oats (*Avena barbata*, UPL), wild oats (*Avena fatua*, UPL), telegraph weed (*Heterotheca grandiflora*, UPL), Australian saltbush (*Atriplex semibaccata*, FAC), and the heliotrope. As noted above, 12 areas were sampled where heliotrope was determined to be a dominant species. It is important to note that heliotrope is not dominant on most of the site including the area previously determined to be wetland and as such, selection of those areas where heliotrope was observed to be locally dominant results in a very conservative approach relative to identification of wetlands on the site.

As noted, one of the sampling points exhibited a predominance of species with an indicator status of FAC or wetter: Sampling Point K, which included ripgut (*Bromus diandrus*, UPL), Seaside Heliotrope (*Heliotropum curassavicum*, OBL), and Bermuda grass (*Cynodon dactylon*, FAC). This area was determined to be upland based on three factors: 1) the overall upland character of the site, 2) the presence of adjacent upland areas contiguous with this small area and 3) the failure to meet the FAC-Neutral test, resulting in a finding of upland for this area. While point K was determined to be upland, it is worth noting that it is not located within the Hotel site and would be located with the area of native plantings within or in close proximity to the wetland buffer.

Appendix A

California Coastal Commission. January 18, 2003. Staff Report for Application Number 5-01-450. Pages 11 & 12.

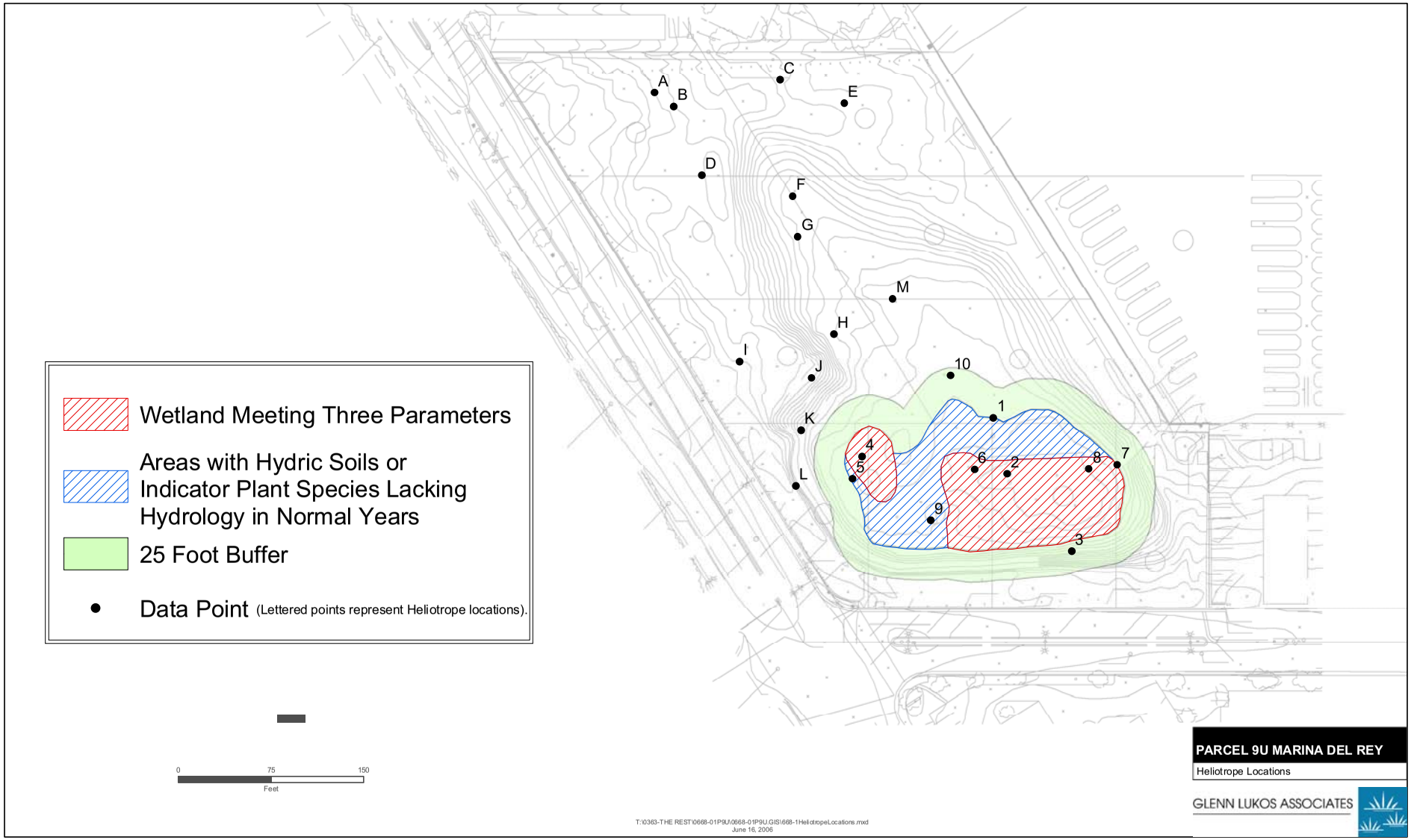
Wetland status of land proposed to be disturbed in Area A.

Area A has been surveyed twice after the delineation that occurred as part of the local coastal program. There is a wetland near the end of the Marina Drain and in other lower areas near the center of the site. The land subject to disturbance in this project was not identified as a wetland in any of the surveys. When the present project was initially discussed, a Fish and Game biologist visited the site and concurred that the project would not disturb any wetland. Most recently, the applicant's consultants surveyed the site in area of disturbance. The senior staff biologist, Dr. John Dixon also visited the site briefly in the fall of 2001. He requested additional documentation of the species and locations of plants present, which the applicant completed. In late July, both the opponents and the applicant identified a small (300 sq. ft. stand) of seaside heliotrope (*Heliotropium currassavicum*), within the area identified for widening. The heliotrope is located six or seven feet above the elevation of the road, in an area that is otherwise dominated by weedy introduced plants such as mustard and chrysanthemum. The applicant contends that while heliotrope is sometimes identified with wetlands, that in this instance, it does not indicate that the area is a wetland. After the applicant provided additional information regarding the heliotrope, Dr. Dixon reviewed the report and revisited the site. The report (Exhibit 19) documents that heliotrope is frequently found in arid sites, as well as in wetlands[4]. In addition, Dr. Dixon visited the site on December 4, 2002 and also examined photographs taken in the spring, summer and in the fall 2002. He concluded that in this instance heliotrope is not acting as a hydrophyte, does not indicate wetland hydrology and probably was not the predominate vegetation in the spring when the wetland delineation was conducted. At that time, upland species, such as non-native grasses and other exotics including Chrysanthemum, appeared to predominate. However, by about July 31, 2002, the standing upland vegetation in the immediate vicinity of the heliotrope was gone and heliotrope appears to be the principal dominant species present in a small open area. By December 4, 2002, the surface growth of heliotrope had dried out and dense seedlings of what appeared to by Chrysanthemum coronarium were the dominant. Despite the fact that heliotrope dominated small patch of ground late in the dry season, Dr. Dixon concluded that the predominant vegetative characteristic of this site is

[4] Dr. John Dixon, CCC staff ecologist, also believes that seaside heliotrope, *Heliotropium curassavicum*, is misclassified in the U.S. Fish and Wildlife Service National List of Plant Species That Occur in Wetlands, Region 0 – California. This belief is based on the observed common occurrence of this species in dry, upland settings in southern California and by the assertion of Mr. Wayne Ferren (U.C. Santa Barbara Herbarium) on November 29, 2001 at a symposium of the Southern California Wetland Recovery Project that *H. curassavicum* is misclassified and should be designated FAC (plants with similar likelihood of occurring in both wetlands and nonwetlands).

upland, not wetland. Heliotrope is frequently found in upland situations and at this site was associated with upland species during most of the year.

The Commission notes that the heliotrope is very similar in growth pattern and location and to the situation of the heliotrope identified within the Culver Loop (CDP 5-01-382A-5-00-4174). In that case the Commission's senior biologist Dr. John Dixon, also determined that the area could not be considered wetland, even though heliotrope, which is sometimes found in wetlands, was present.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Wetland Meeting Three Parameters
Areas with Hydric Soils or Indicator Plant Species Lacking Hydrology in Normal Years
25 Foot Buffer
Data Point (Lettered points represent Heliotrope locations).
0
75
150
Feet
PARCEL 9U MARINA DEL REY
Heliotrope Locations
GLENN LUKOS ASSOCIATES
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June 16, 2006

GLENN LUKOS ASSOCIATES

Regulatory Services

June 9, 2005
[Revised November 20, 2006]

Mark Rousseau
Woodfin Suite Hotels
12730 High Bluff Drive
San Diego, California 92130

SUBJECT: Jurisdictional Wetland Status of Parcel 9U, Marina del Rey, Los Angeles County, California

Dear Mr. Rousseau:

This letter report summarizes our preliminary findings of U.S. Army Corps of Engineers (Corps) and California Department of Fish and Game (CDFG) jurisdiction, as well as California Coastal Commission (CCC) wetlands for the above-referenced property.[1] The subject parcel covers approximately 3.8 acres and includes an excavated depression in the southern portion of the site. The depression was created in 1984 during construction activities within an upland area that were abandoned and left unfinished. Areas outside the depression are vegetated with upland ruderal species. The excavated depression supports a mixture of plant species that exhibit a range relative to their wetland indicator status from upland (UPL) to obligate (OBL). The southern margin of the basin consists of a berm comprised of spoil materials excavated from the basin. The berm supports narrow-leaf willow (*Salix exigua*, OBL) and upland grasses. Soils below the upper 0.6 feet to two feet of existing soil profile, which consist of dredge material deposited in the 1950s and early 1960s, appear to be relictual hydric soils that formed at depth prior to excavation of the basin. Limited areas within the upper two feet exhibit hydric soil characteristics that appear to have formed in place due to ponding, consistent with the depressional topography. Exhibits 1 and 2 are regional and vicinity maps. Exhibit 3 depicts the location of wetland areas within the excavated depression. Exhibits 4-7 are historic aerials of the site from 1928, 1936, 1956, and 1962 showing changes in land use, including initial development of the site between 1928 and 1936 with further development associated with construction of the marina in the late 1950s through early 1960s.

[1] This report presents our best effort at estimating the subject jurisdictional boundaries using the most up-to-date regulations and written policy and guidance from the regulatory agencies. Only the regulatory agencies can make a final determination of jurisdictional boundaries. If a final jurisdictional determination is required, GLA can assist in getting written confirmation of jurisdictional boundaries from the agencies.

On August 18, October 22, November 3, and December 1, 2004, and January 14, 2005 Regulatory Specialists of Glenn Lukos Associates, Inc. (GLA) examined the project site to determine potential presence of (1) Corps jurisdiction pursuant to Section 404 of the Clean Water Act, (2) CDFG jurisdiction pursuant to Division 2, Chapter 6, Section 1600 of the Fish and Game Code, and (3) any wetlands as defined by the California Coastal Commission. Enclosed is a 125-scale map [Exhibit 3], which depicts the areas of potential Corps jurisdiction as well as potential wetlands as defined under the California Coastal Act. Wetland data sheets are attached as Appendix A. Additional investigations were conducted on the site during 2006, with visits on June 2, June 15, and August 1 2007 focused on upland areas that support seaside heliotrope as this species can be associated with wetlands as described in Memorandum prepared by GLA dated June 20, 2006 and included as Appendix B.[2]

I. METHODOLOGY

Prior to beginning the field delineation a 200-scale aerial photograph and 100-scale base topographic map of the property, were evaluated along with previous constraints reports prepared by PCR Service and EDAW to determine the locations of potential areas of Corps/CDFG jurisdiction and CCC-defined wetlands. Suspected jurisdictional areas were field checked for the presence of wetland vegetation, soils and hydrology using the methodology set forth in the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual[3] (Wetland Manual). While in the field locations where vegetation, soils, and hydrology data were collected were recorded onto a 100-scale base topographic map using visible landmarks. The field data were recorded onto wetland data sheets.

As noted above, site visits were conducted on August 18, October 22, November 3, and December 1, 2004, with the October 22 and November 3 visits timed to evaluate the site within seven days of significant rainfall events, providing for optimal conditions for evaluating wetland hydrology. A succession of winter storms during late December and early January, which ended on January 10, 2005, resulted in record rainfall for a 15-day period. This period of rainfall that accounted for approximately 15 inches, and resulted in inundation of the depression. For purposes of determining wetland hydrology, this period does not represent a “normal” or “average” rainfall year and is not suitable for making a positive determination for wetland

[2] Glenn Lukos Associates. June 20, 2006. Memorandum addressing: Occurrences of Seaside Heliotrope (*Heliotropum curassivicum*) at Parcel 9U, Marina del Rey, California.
[3] Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experimental Station, Vicksburg, Mississippi.

hydrology. As such, the limits of jurisdictional wetlands (or potential wetlands) discussed below are based on the data collected prior to the storms of late December and early January 2004/05.

A. Soils

The Soil Conservation Service (SCS)[4] has mapped the "Oceano" soil type as occurring in the general vicinity of the project site.[5] A review of historic aerial photographs indicate that prior to development in the late 1920s or early 1930s, the site consisted of "Tidal Flats", a soil type not included in the Los Angeles County Soil Survey. Currently, the entire site is overlain by dredge spoils/hydraulic fill that were placed behind the seawall constructed during development of the marina [Exhibit 7 shows the site following deposition of the hydraulic fill]. The fill varies from over ten feet deep on the highest portions of the site to between 0.6 and 2.0 feet in the lowest portions of the depression. [6]

Oceano

Oceano soils occur on undulating dune-like areas between sea level and 100 feet. These soils are over 60 inches deep and exhibit rapid permeability. They have grayish-brown, slightly acid and medium acid sand surface layers with strongly acid substratum also consisting of sand.

The soil series Oceano is not included in the SCS's publication, Hydric Soils of the United States[7]; and are not identified as hydric in the local hydric soils list for the Los Angeles Area, California. Previous activities on the site have included deposition of dredge spoils during construction of the adjacent marina and excavation performed during construction of commercial facilities that was halted shortly after the excavation was completed. As such, soil conditions on the site do not appear to represent the "native" condition but rather, reflect the various activities that have occurred on the site during the last four to five decades.

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[4] SCS is now known as the National Resource Conservation Service or NRCS.
[5] United States Department of Agriculture, Soil Conservation Service. 1969. Report and General Soil Map, Los Angeles County, California. Foldout map accompanying report is dated 1994.
[6] Van Beveren & Butelo, Inc. Letter Report to Mr. Thomas Farrell. Subject: Surface of Natural Soil Deposits Proposed Hotel and parking Structure Site, Marina del Rey, Los Angeles County, California.
[7] United States Department of Agriculture, Soil Conservation Service. 1991. Hydric Soils of the United States, 3rd Edition, Miscellaneous Publication Number 1491. (In cooperation with the National Technical Committee for Hydric Soils.)

Tidal Flats

Tidal flats are nearly level areas adjacent to bays and lagoons along the coast. Periodically these are covered by tidal overflow. Some of the higher areas are covered only during very high tides. Tidal flats are stratified clayey to sandy deposits. They are poorly drained and high in salts. As noted above, hydraulic fill was deposited on the site, and the excavation in 1984 removed much of this material leaving only 0.6 to 2.0 feet overlaying the native substrate that consisted presumably of tidal flats, which remain under the layer of fill.

B. <u>Aerial Photographic Analysis</u>

In order to better understand the site conditions and how previous activities have altered the site, GLA has conducted an analysis of historic aerial photographs of the site in conjunction with a review of the history of the site covering the period between 1927 and the present. This review includes a review of previous documentation that addresses soil/geological conditions on the site and interviews with local experts who have conducted geotechnical investigations during the previous five decades.

II. JURISDICTION

Federal Jurisdiction

A. <u>Army Corps of Engineers</u>

1. Section 404 of the Clean Water Act

Pursuant to Section 404 of the Clean Water Act, the Corps regulates the discharge of dredged and/or fill material into waters of the United States. The term "waters of the United States" is defined in Corps regulations at 33 CFR Part 328.3(a) as:

> *(1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;*
> *(2) All interstate waters including interstate wetlands;*
> *(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect foreign commerce including any such waters:*

(i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
(ii) From which fish or shell fish are or could be taken and sold in interstate or foreign commerce; or
(iii) Which are used or could be used for industrial purpose by industries in interstate commerce...

(4) All impoundments of waters otherwise defined as waters of the United States under the definition;
(5) Tributaries of waters identified in paragraphs (a) (1)-(4) of this section;
(6) The territorial seas;
(7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) (1)-(6) of this section.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 123.11(m) which also meet the criteria of this definition) are not waters of the United States.

In the absence of wetlands, the limits of Corps jurisdiction in non-tidal waters, such as intermittent streams, extend to the OHWM which is defined at 33 CFR 328.3(e) as:

...that line on the shore established by the fluctuation of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

The term “wetlands” (a subset of “waters of the United States”) is defined at 33 CFR 328.3(b) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support...a prevalence of vegetation typically adapted for life in saturated soil conditions." In 1987 the Corps published a manual to guide its field personnel in determining jurisdictional wetland boundaries. The methodology set forth in the 1987 Wetland Delineation Manual generally requires that, in order to be considered a wetland, the vegetation, soils, and hydrology of an area exhibit at least minimal hydric characteristics. While the manual provides great detail in methodology and allows for varying special conditions, a wetland should normally meet each of the following three criteria:

- more than 50 percent of the dominant plant species at the site must be typical of wetlands (i.e., rated as facultative or wetter in the National List of Plant Species that Occur in Wetlands[8]);

- soils must exhibit physical and/or chemical characteristics indicative of permanent or periodic saturation (e.g., a gleyed color, or mottles with a matrix of low chroma indicating a relatively consistent fluctuation between aerobic and anaerobic conditions); and

- hydrologic characteristics must indicate that the ground is saturated to within 12 inches of the surface for at least five percent of the growing season during a normal rainfall year[9].

a. Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, et al.

Pursuant to Article I, Section 8 of the U.S. Constitution, federal regulatory authority extends only to activities that affect interstate commerce. In the early 1980s the Corps interpreted the interstate commerce requirement in a manner that restricted Corps jurisdiction on isolated (intrastate) waters. On September 12, 1985, EPA asserted that Corps jurisdiction extended to isolated waters that are used or could be used by migratory birds or endangered species, and the definition of "waters of the United States" in Corps regulations was modified as quoted above from 33 CFR 328.3(a).

On January 9, 2001, the Supreme Court of the United States issued a ruling on *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, et al.* (SWANCC). In this case the Court was asked whether use of an isolated, intrastate pond by migratory birds is a sufficient interstate commerce connection to bring the pond into federal jurisdiction of Section 404 of the Clean Water Act.

The written opinion notes that the court's previous support of the Corps' expansion of jurisdiction beyond navigable waters (*United States v. Riverside Bayview Homes, Inc.*) was for a wetland that abutted a navigable water and that the court did not express any opinion on the question of the authority of the Corps to regulate wetlands that are not adjacent to bodies of open water. The current opinion goes on to state:

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[8] Reed, P.B., Jr. 1988. National List of Plant Species that Occur in Wetlands. U.S. Fish and Wildlife Service Biological Report 88(26.10).

[9] For most of low-lying southern California, five percent of the growing season is equivalent to 18 days.

> *In order to rule for the respondents here, we would have to hold that the jurisdiction of the Corps extends to ponds that are not adjacent to open water. We conclude that the text of the statute will not allow this.*

Therefore, we believe that the court's opinion goes beyond the migratory bird issue and says that no isolated, intrastate water is subject to the provisions of Section 404(a) of the Clean Water Act (regardless of any interstate commerce connection). However, the Corps and EPA have issued a joint memorandum which states that they are interpreting the ruling to address only the migratory bird issue and leaving the other interstate commerce clause nexuses intact..

b. Adjacency and Adjacent Wetlands

As noted in Paragraph 7 of 33 CFR 328.3, the Corps regulates wetlands that are adjacent to other jurisdictional waters. Corps regulations define adjacent to mean "bordering, contiguous, or neighboring" and further state: "Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes and the like are 'adjacent wetlands'. It should be noted that the courts have interpreted the 'criterion' for adjacency broadly, and found that wetland were 'adjacent' even when separated by substantial distances or by substantial barriers. For example, one court found adjacency for lots one-half-mile from a navigable water and in another instance where a wetland was separated from a navigable water by a fifty-foot-wide paved street.

2. Section 10 of the Rivers and Harbors Act

Pursuant to Section 10 of the Rivers and Harbors Acts of 1899 (33 U.S.C. 403), the Corps regulates any obstruction or alteration to navigable waters of the United States. Navigable waters of the Pacific Ocean extend to the line on the shore reached by the mean of the higher high waters (MHHW)[10]. The MHHW reaches an elevation of about 3.0 feet near Marina del Rey.

[10] Corps of Engineers. Los Angeles District. November 29, 1972. Public Notice Relative to Navigable Waters Within the Los Angeles District.

State of California Jurisdiction

B. <u>California Coastal Commission - California Coastal Act</u>

1. California Coastal Act Wetland Definitions and Policy Guidance

The CCC regulates the diking, filling, or dredging of wetlands within the coastal zone. Section 30121 of the Coastal Act defines "wetlands" as land "*which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens.*" The 1981 CCC Statewide Interpretive Guidelines state that hydric soils and hydrophytic vegetation "*are useful indicators of wetland conditions, but the presence or absence of hydric soils and/or hydrophytes alone are not necessarily determinative when the Commission identifies wetlands under the Coastal Act. In the past, the Commission has considered all relevant information in making such determinations and relied upon the advice and judgment of experts before reaching its own independent conclusion as to whether a particular area will be considered wetland under the Coastal Act. The Commission intends to continue to follow this policy.*"

The 1981 CCC Statewide Interpretive Guidelines define riparian habitats as areas of riparian vegetation. Riparian vegetation is defined as "*an association of plant species which grows adjacent to freshwater watercourses, including perennial and intermittent streams, lakes, and other bodies of fresh water*." Riparian habitats may encompass wetland areas, but may also extend beyond those areas.

As discussed above (and below), areas regulated by the Corps, CCC, and CDFG are often not coincident due to the differing goals of the respective regulatory programs and also because these agencies use different definitions for determining the extent of wetland areas. For example, the Corps requires that positive indicators for the presence of wetland hydrology, hydric soils, and a predominance of hydrophytic vegetation be present for an area to meet the Corps' wetland definition. The Coastal Commission does not necessarily require that indicators for wetland hydrology, hydric soils, and a predominance of hydrophytic vegetation be present for an area to be determined to by a "wetland"; rather, the presence of hydric soils in the absence of a predominance of hydrophytes (or vice versa) could be sufficient for a positive wetland determination.

2. California Coastal Act – Environmentally Sensitive Habitat Areas

The California Coastal Act (California Public Resources Code Division 20, Section 30240a) restricts land uses within or adjacent to environmentally sensitive habitat areas (ESHAs). The Coastal Act Section 30107.5 defines an ESHA as:

> *…any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.*

Included within this definition are wetlands, estuaries, streams, riparian habitats, lakes, and portions of open coastal waters, which meet the rare or valuable habitat criteria. Not all wetlands necessarily meet the "rare or valuable habitat criteria" and as set forth in Section 30233, "where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects" degraded or low-value wetlands that do not which meet the rare or valuable habitat criteria may be subject to restoration in accordance with Section 30233.7.

B. <u>Regional Water Quality Control Board</u>

Subsequent to the SWANCC decision, the Chief Counsel for the State Water Resources Control Board issued a memorandum that addressed the effects of the SWANCC decision on the Section 401 Water Quality Certification Program.[11] The memorandum states:

> *California's right and duty to evaluate certification requests under section 401 is pendant to (or dependent upon) a valid application for a section 404 permit from the Corps, or another application for a federal license or permit. Thus if the Corps determines that the water body in question is not subject to regulation under the COE's 404 program, for instance, no application for 401 certification will be required…*
>
> *The SWANCC decision does not affect the Porter Cologne authorities to regulate discharges to isolated, non-navigable waters of the states….*
>
> *Water Code section 13260 requires "any person discharging waste, or proposing to discharge waste, within any region that could affect the waters of the state to file a report of discharge (an application for waste discharge requirements)."*

[11] Wilson, Craig M. January 25, 2001. Memorandum addressed to State Board Members and Regional Board Executive Officers.

> *(Water Code § 13260(a)(1) (emphasis added).) The term "waters of the state" is defined as "any surface water or groundwater, including saline waters, within the boundaries of the state." (Water Code § 13050(e).) The U.S. Supreme Court's ruling in SWANCC has no bearing on the Porter-Cologne definition. While all waters of the United States that are within the borders of California are also waters of the state, the converse is not true—waters of the United States is a subset of waters of the state. Thus, since Porter-Cologne was enacted California always had and retains authority to regulate discharges of waste into any waters of the state, regardless of whether the COE has concurrent jurisdiction under section 404. The fact that often Regional Boards opted to regulate discharges to, e.g., vernal pools, through the 401 program in lieu of or in addition to issuing waste discharge requirements (or waivers thereof) does not preclude the regions from issuing WDRs (or waivers of WDRs) in the absence of a request for 401 certification….*

Thus, discharge of fill material into waters of the State that do not fall under the jurisdiction of the Corps pursuant to Section 404 of the Clean Water Act, may require authorization through application for waste discharge requirements (WDRs) or through waiver of WDRs.

C. <u>California Department of Fish and Game</u>

Pursuant to Division 2, Chapter 6, Sections 1600-1603 of the California Fish and Game Code, the CDFG regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake, which supports fish or wildlife.

CDFG defines a "stream" (including creeks and rivers) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having surface or subsurface flow that supports or has supported riparian vegetation." CDFG's definition of "lake" includes "natural lakes or man-made reservoirs."

CDFG jurisdiction within altered or artificial waterways is based upon the value of those waterways to fish and wildlife. CDFG Legal Advisor has prepared the following opinion:

- Natural waterways that have been subsequently modified and which have the potential to contain fish, aquatic insects and riparian vegetation will be treated like natural waterways...

- Artificial waterways that have acquired the physical attributes of natural stream courses and which have been viewed by the community as natural stream courses, should be treated by [CDFG] as natural waterways...

- Artificial waterways without the attributes of natural waterways should generally not be subject to Fish and Game Code provisions...

Thus, CDFG jurisdictional limits closely mirror those of the Corps. Exceptions are CDFG's exclusion of isolated wetlands (those not associated with a river, stream, or lake), the addition of artificial stock ponds and irrigation ditches constructed on uplands, and the addition of riparian habitat supported by a river, stream, or lake regardless of the riparian area's federal wetland status.

III. RESULTS

A. Review of Historic Conditions

An aerial photograph from 1928 [Exhibit 4] indicates that historically, the site was part of the Balloña wetland complex and likely supported salt marsh vegetation. Between 1928 and 1936 development occurred on the site, which remained generally unchanged until the extensive development associated with construction of the marina in the late 1950s through early 1960s. Exhibits 5 and 6 depict the site as developed between 1936 and 1956. Construction of the marina in the late 1950s and early 1960s included construction of a seawall that allowed for deposition of hydraulic fill behind the seawall to create a pad for future building construction.[12] Exhibit 7 is an aerial photograph from 1962 that shows the site with the sewer vent that is now located within the excavated depression.

The depression was excavated in 1984 for a development project, but was halted well before completion, leaving between 0.60 and two feet of historic fill overlaying the natural surface in the lowest portions of the excavated depression as noted in Section I.A above. The I-beam pilings installed as part of the construction operation still ring the site and a concrete foundational structure, which was installed within the excavated basin, is still intact. The excavated depression is clearly not a natural feature and is hydrologically isolated (i.e., the closed basin does not exhibit surface hydrological connections to other jurisdictional waters including the adjacent marina). Rather, the site is surrounded on all sides by existing development. While limited areas within this feature exhibit positive indicators for the presence of wetland characteristics, as discussed below under “Jurisdictional Delineation”, wetland functions associated with the feature are minimal as noted below under “Wetland Functions”.

[12] Van Beveren & Butelo, Inc. Letter Report to Mr. Thomas Farrell. Subject: Surface of Natural Soil Deposits Proposed Hotel and parking Structure Site, Marina del Rey, Los Angeles County, California.

B. Jurisdictional Delineation

The entire site covers approximately 3.8 acres and the excavated depression in the southern portion of the site covers little over one acre. Areas outside the depression are vegetated with upland ruderal species including riput (*Bromus diandrus*, UPL), soft chess (*Bromus hordeaceus*, UPL), bur clover (*Medicago polymorpha*, UPL), foxtail barley (*Hordeum murinum*ssp. *Leporinum*, NI), cheeseweed (*Malva parviflora*, UPL), small-flowered iceplant (*Mesembryanthemum* nodiflorum, UPL), seaside heliotrope (*Heliotropum curassivicum*, FAC[13]), and garland chrysanthemum (*Chrysanthemum coronarium*, UPL). Areas that support seaside heliotrope area addressed in Appendix B, which also includes separate data sheets for specific areas addressed in the appendix. The excavated depression supports a mixture of plant species that exhibit a range relative to their wetland indicator status from upland (UPL) to obligate (OBL), based at least in part with their location in the basin. The southern margin of the basin consists of a berm made up of spoil materials, which is presumed to have been created using material from the excavated basin. The berm supports narrow-leaf willow (*Salix exigua*, OBL) and upland grasses.

Data was collected at ten locations including eight locations within the depression and two on the berm. A description of the vegetation, soils, and potential hydrology are discussed for each data collection point.

1. Three Parameter Wetlands [Potential Corps and Coastal Commission Wetlands]

Data collected at Data Points 2, 4, 6, and 8 [encompassed by the polygons depicted on Exhibit 3], exhibit vegetation, soils and hydrology that are consistent with the presence of wetlands. The wettest area in the vicinity of Data Points 2 and 8, support alkali bulrush (*Scirpus maritimus*, OBL), alkali weed (*Cressa truxillensis*, FACW) with the presence of the alkali bulrush as the strongest indicator for wetland conditions. Hydric soil indicators observed at Data Points 2, 4, 6, and 8 appear to have formed in response to current site hydrological conditions including sulfidic odor in Soil Pit 2 (i.e., Data Point 2) and low chroma matrix with areas with redoxymorphic features for Data Points 4, 6, and 8. Wetland hydrology, at Data Points 2, 4, 6, and 8, was indicated by the presence of saturated lenses within the upper 12 inches of the soil.
As noted above, the Corps requires that all three parameters be present in order to make a positive wetland determination. Because the area encompassed by the polygons that include data points 2, 4, 6, and 8 satisfy all three criteria, the area could be determined to be a jurisdictional

[13] As described in Appendix B that addresses occurrences of the seaside heliotrope on the site, this species is treated as a "facultative" species for purposes of this report.

wetland if the Corps determines that the wetland area is adjacent to the jurisdictional waters associated with Marina del Rey. The area encompassed by the two polygons covers approximately 0.26 acre.

The 0.26-acre area that exhibits positive indicators for wetland hydrology, hydric soils and hydrophytic vegetation is not connected hydrologically to other navigable waters (i.e., Marina del Rey/Pacific Ocean). As discussed in II.A.1.b above ,the Corps could assert jurisdiction over the 0.26-acre area based on adjacency to other navigable waters (i.e., Marina del Rey/Pacific Ocean), and given the proximity of the 0.26-acre area to the marina (approximately 85 feet) it is expected that the Corps will in fact assert jurisdiction over this feature.

2. Single Parameter Wetlands [Potential Coastal Commission Wetlands]

Data collected at Data Points 1, 5, and 9 [encompassed by the polygon on Exhibit 3], do not exhibit all three parameters; however, they do exhibit positive indicators for hydric soils [Data Point 1] or hydrophytic vegetation [Data Points 1, 5, and 9]. These areas lacked wetland hydrology during the field visits conducted in October, November and early December 2004, although rainfall totals were above average during this period. Subsequently, following the extreme storms of late December 2004 and early January 2005, the area became inundated; however the approximately 15 inches of rain in a two week period do not represent “normal” conditions and would not be used in determining whether the site exhibits wetland hydrology. Nevertheless, the presence of hydric soils (potentially relictual) and/or hydrophytic vegetation may be sufficient for the Coastal Commission to make a wetland determination for this portion of the site and as such it is identified as an area with hydric soils and hydrophytic vegetation. The area encompassed by this polygon covers approximately 0.21 acre. Combined, the 0.26 acre area that exhibits characteristics consistent with the presence of a three-parameter wetland and 0.21-acre area that exhibits at least one parameter would both be regulated as wetland by the Coastal Commission for a total of 0.47 acre of Coastal Commission jurisdiction.

3. California Department of Fish and Game

The excavated depression does not meet the definition of either a lake or a stream in accordance with the California Fish and Game Code, and would not be subject to regulation by CDFG pursuant to Section 1602 of the California Fish and Game Code.

3. Regional Water Quality Control Board

If the Corps asserts jurisdiction over the 0.26-acre portion of the isolated depression, it will be necessary to obtain a Section 401 Water Quality Certification from the Regional Board as a

condition of the Section 404 from the Corps. If the Corps does not assert jurisdiction over this feature, then the Regional Board would assert jurisdiction in accordance with the Porter Cologne Act and require a waste discharge permit (WDR).

C. Wetland Functions Associated with Portions of Excavated Basin

As noted above, approximately 0.26 acre of the excavated basin meets the Corps definition of wetland as it exhibits positive indicators (albeit minimally) for wetland hydrology, hydric soils and a predominance of hydrophytes. An additional 0.21 acre exhibits positive indicators for the presence of hydric soils and/or hydrophytes and could be considered wetland under the California Coastal Act.

It does not follow from the mere presence of wetland indicators, that the 0.26 acre area or 0.21 acre area exhibit important or even measurable wetland functions. In fact, the excavated basin exhibits minimal wetland function as it supports very limited areas of native vegetation and includes a large percentage of non-native species. The site does not support or have the potential to support state- or federally listed plants or animals or other special-status plants or animals. Additionally, as noted above, the small site (less than four acres with the potential wetland areas totaling less than 0.50 acre combined) is completely surrounded by development and supports only wildlife species that are adapted to the urban environment. Because the potential wetland areas are associated with a closed depression the potential for hydrologic or water quality functions are very limited.

If you have any questions about this letter report, please contact Tony Bomkamp at (949) 837-0404 ext. 41.

Sincerely,

GLENN LUKOS ASSOCIATES, INC.

Tony Bomkamp
Regulatory Specialist
s:0668-1a.jd.doc

Adapted from National Geographic TOPO!

NORTH

0 2 4 6

MILES

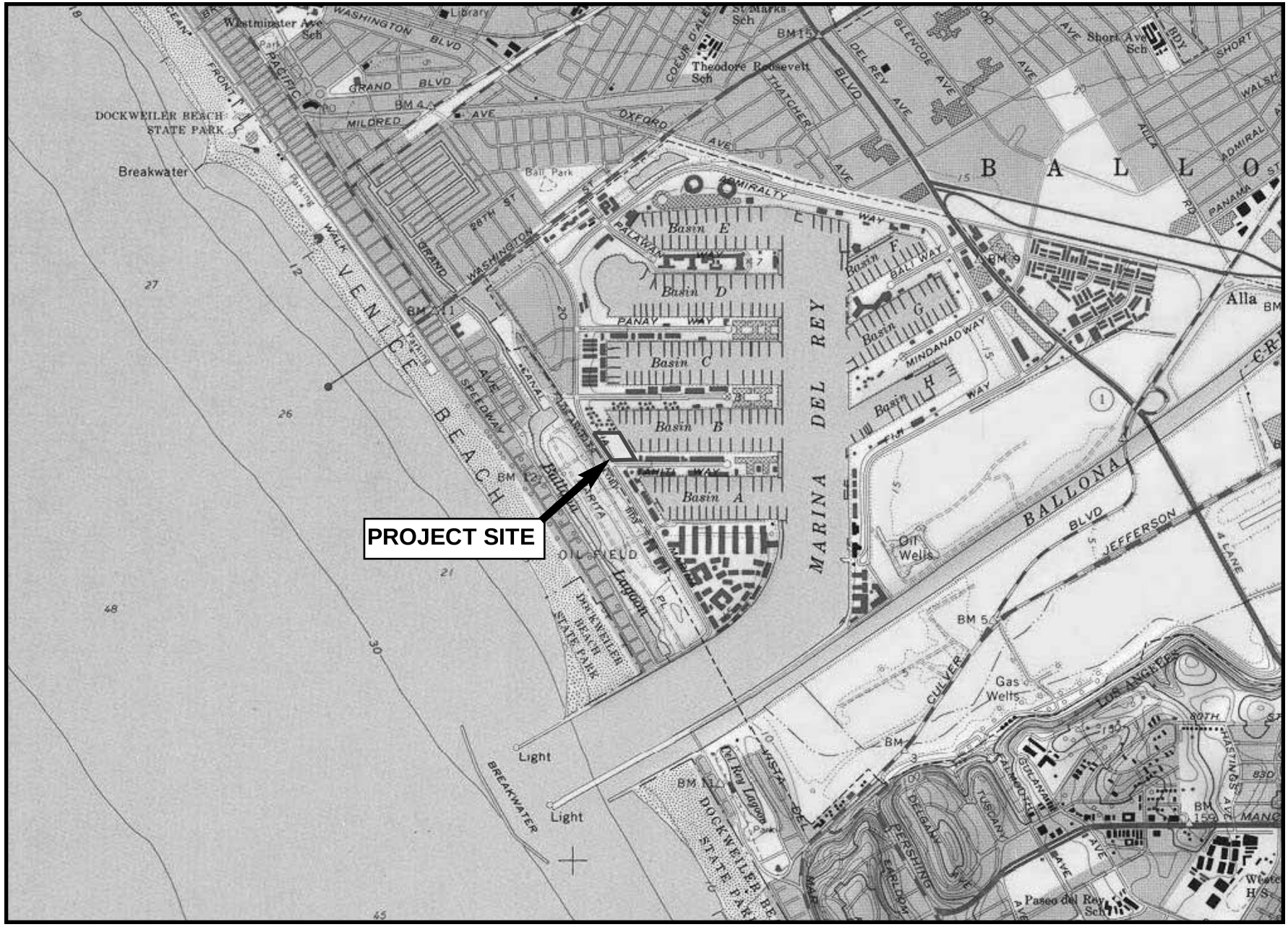
PARCEL 9U

Regional Map

GLENN LUKOS ASSOCIATES

EXHIBIT 1

Adapted from USGS Venice quadrangle

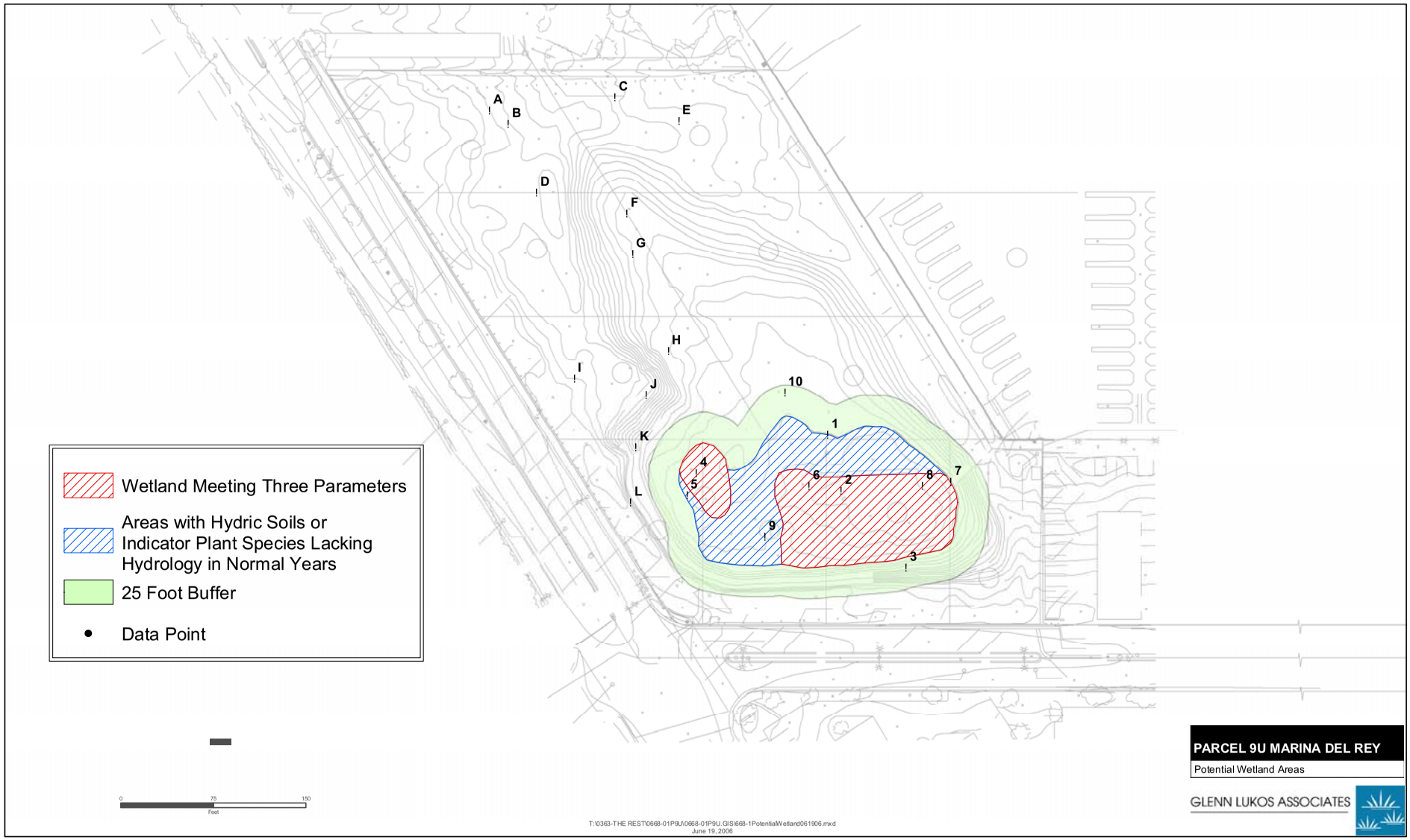


PARCEL 9U

Vicinity Map

GLENN LUKOS ASSOCIATES

EXHIBIT 2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Wetland Meeting Three Parameters
Areas with Hydric Soils or Indicator Plant Species Lacking Hydrology in Normal Years
25 Foot Buffer
Data Point
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75
150
Feet
PARCEL 9U MARINA DEL REY
Potential Wetland Areas
GLENN LUKOS ASSOCIATES
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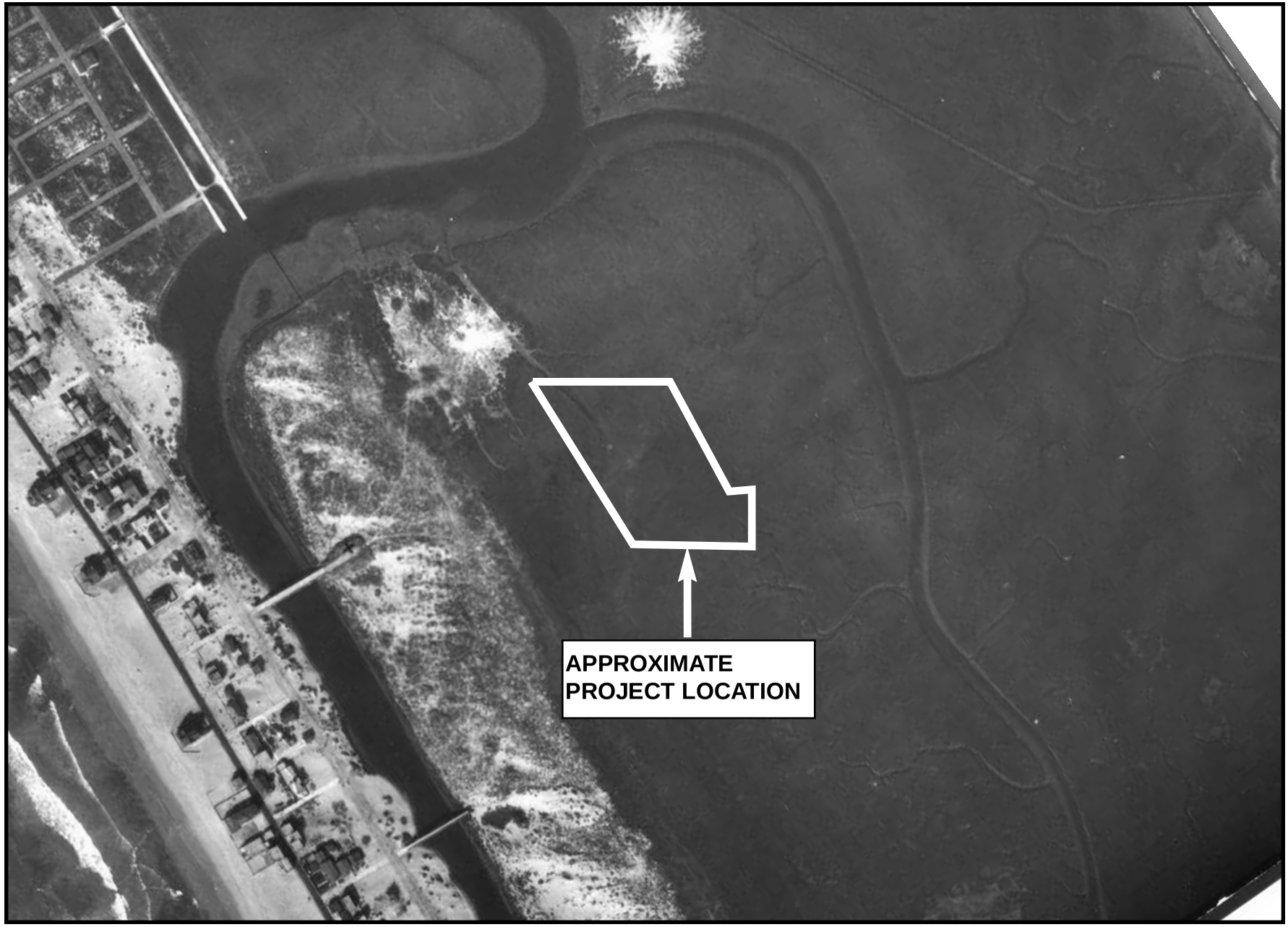
June 19, 2006



Adapted from Fairchild Aerial Photography Collection Flight C-164 Frame 14

NORTH

PARCEL 9U

1928 Historic Aerial Photograph

GLENN LUKOS ASSOCIATES

Exhibit 4

Adapted from Fairchild Aerial Photography Collection
Flight C-3847 Frame 11

NORTH

PARCEL 9U

1936 Historic Aerial Photograph

GLENN LUKOS ASSOCIATES

Exhibit 5

Adapted from Fairchild Aerial Photography Collectioin
Flight C-22403A Frame 11

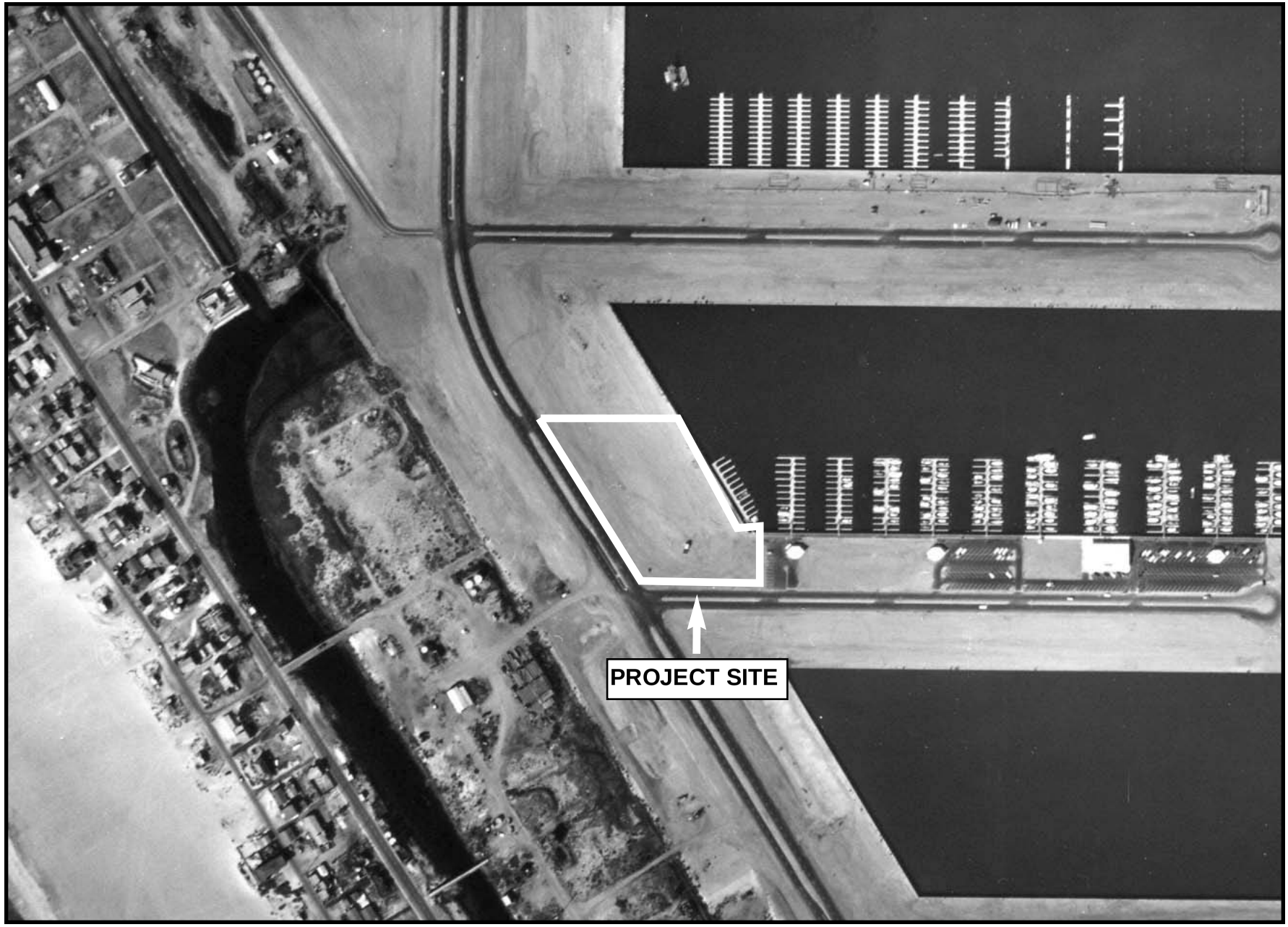
NORTH

PARCEL 9U

1956 Historic Aerial Photograph

GLENN LUKOS ASSOCIATES

Exhibit 6



Adapted from Fairchild Aerial Photography Collection
Flight C-24400 Frame 16:101

NORTH

PARCEL 9U

1962 Historic Aerial Photograph

GLENN LUKOS ASSOCIATES

Exhibit 7

CONCEPTUAL RESTORATION PLAN FOR DEGRADED ARTIFICIAL WETLAND ASSOCIATED WITH PARCEL 9U MARINA DEL REY

FOR THE WOODFIN RESORT

CITY OF MARINA DEL REY
LOS ANGELES COUNTY, CALIFORNIA

FEBRUARY 2006
[REVISED NOVEMBER 2006]

Prepared for:

Woodfin Suite Hotels
12730 High Bluff Drive
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I.	**PROJECT DESCRIPTION and SUMMARY**	

The project site covers approximately 3.8 acres and includes an excavated depression in the southern portion of the property. The depression was created in 1984 during construction activities within an upland area that were abandoned and left unfinished. Areas outside the depression are vegetated with upland ruderal species. The excavated depression supports a mixture of plant species that exhibit a range relative to their wetland indicator status from upland (UPL) to obligate (OBL). The southern margin of the basin consists of a berm comprised of spoil materials excavated from the basin that supports narrow-leaf willow (*Salix exigua*, OBL) and upland grasses. Soils below the upper 0.6 feet to two feet of existing soil profile, which consist of dredge material deposited in the 1950s and early 1960s, appear to be relictual hydric soils that formed at depth prior to excavation of the basin. Limited areas within the upper two feet exhibit hydric soil characteristics that appear to have formed in place due to ponding, consistent with the depressional topography of the excavated basin.

A jurisdictional delineation conducted by Glenn Lukos Associates (GLA) in 2005 identified approximately 0.47 acre of wetlands within the excavated basin of which 0.26 acre consists of wetlands that exhibit positive indicators for wetland hydrology, hydrophytic vegetation and hydric soils and an additional 0.21 acre that lacked positive indicators for at least one of the three criteria but would still be considered wetland pursuant to California Coastal Act policies. In order to enhance the aquatic function of the excavated wetland basin, the applicant proposes a rehabilitation program for the basin that would include re-contouring, removal of non-native species, enhancement of the hydrological regime through creation of a muted tidal connection, and establishment of native coastal salt marsh habitat appropriate to the area, including special-status species that would enhance the overall value of the wetland. In addition to the restoration of the 0.47 acre saltwater marsh, the open space areas surrounding the marsh would be planted with species indicative of native habitats along the California coast such as coastal prairie, coastal sage scrub, coastal bluff scrub and maritime chaparral. These plantings will serve as a buffer for the saltwater marsh, and will provide educational opportunities for the public.

A. Location of Project

The 3.8-acre Parcel 9U is located in the City of Marina Del Rey, Los Angeles County, California [USGS 7.5' Venice, California quadrangle map at Township 2S, Range 15W, unsectioned], [Exhibit 1 – Regional Map]. The project is located north of Tahiti Way, west of Basin B of Marina Del Rey, east of Via Marina, and south of a residential development [Exhibit 2 – Vicinity Map]. According to the U.S. Geological Survey (USGS) topographic map of Venice, California [dated 1964 and photorevised in 1981], the Project area supports no blue-line streams. Adjoining properties consist of residential development and Basin B of Marina Del Rey.B.

B. Responsible Parties

Applicant:	Woodfin Suites Hotels 12730 High Bluff Drive San Diego, California 92130
Preparers of Restoration Plan:	Glenn Lukos Associates, Inc. 29 Orchard Lake Forest, California 92630 Phone: (949) 837-0404 Fax: (949) 837-5834 Contact: Tony Bomkamp

C. Areas to be Restored by Habitat Type

The excavated depression supports a mixture of native and non-native plant species that exhibit a range relative to their wetland indicator status from upland (UPL) to obligate (OBL), based at least in part with their location in the basin. The southern margin of the basin consists of a berm made up of spoil materials, which is presumed to have been created using material from the excavated basin. The berm supports narrow-leaf willow (*Salix exigua*, OBL) and upland grasses with ripgut brome (*Bromus diandrus*, UPL) as the most prevalent. The wettest (lowest) area in basin supports limited areas of alkali bulrush (*Scirpus maritimus*, OBL), alkali weed (*Cressa truxillensis*, FACW) and small patches of pickleweed (*Salicornia virginica*). Large portions of the basin exhibit little vegetation or support non-native five-hook bassia (*Bassia hyssopifolia*, FAC).

D. Type(s), Functions, and Values of the Areas to be Restored

The basin is artificial, having been created during previous construction efforts that were left unfinished. The basin is very deep, approximately eight feet below the ground surface on the adjacent portions of the site and only exhibits wetland conditions during high rainfall years. In dry

years, the basin exhibits upland characteristics. Other than very limited areas of native wetland habitat (alkali bulrush, alkali weed and pickleweed), the existing basin is either unvegetated or vegetated with non-native ruderal species such as five-hook bassia.

Hydrologic Functions

As noted, the artificial basin is very deep, well below the surface of the adjacent upland areas. Furthermore, because much of the site was subject to deposition of dredge material during construction of the marina, the substrate in much of the basin is sand that allows rapid percolation of rain water such in most years rainfall and local runoff from limited portions of the site do not result in ponded conditions. As such, the depression exhibits ponding only during above-average rainfall years and supports wetland plant during these years. During other years the basin supports a predominance of upland species.

Biogeochemical Functions

The vegetation located along the upper margins of the pool provides limited filtering of sediments and pollutants prior to entering the pool; however, as the ponded area is mostly unvegetated, the pool provides very limited water quality benefits. Furthermore, because the basin is a closed depression, there is no hydrologic connection with any areas offsite, limiting the effects of any biogeochemical functions to the site.

Functions Related to Habitat

The basin supports very limited habitat value for both native plants and animals. A small area of native alkali bulrush occurs within the deepest portion of the basin. Narrow-leaf willow occurs on the upland berm adjacent to the southern margin of the basin that lacks wetland hydrology and hydric soils. The limited area of willow habitat supports species common within the urban setting such as black phoebe, common mallard, and mourning dove.

II. GOAL OF RESTORATION

A. Type(s) of Habitat to be Created/Enhanced

The wetland basin to be enhanced was created during previous construction on the site, which left an eight-foot-deep depression. The depression exhibits only limited wetland function and other than approximately 150-200 square feet that is occupied by native alkali bulrush and alkali weed, the site is best characterized as “ruderal.” The goal of the restoration/enhancement program is to create coastal salt marsh habitat with a “muted” tidal regime that supports a suite of native plants that also exhibits enhanced functions for wildlife. Enhancement of the excavated depression would

include re-contouring of the depression and establishment of a muted tidal connection to provide enhanced hydrologic and habitat functions. Areas surrounding the basin would be planted with coastal prairie, coastal sage scrub, coastal bluff scrub and maritime chaparral plantings to provide a buffer zone for the restored saltwater marsh.

B. Functions and Values of Habitat to be Created/Enhanced

Hydrologic Functions

Hydrologic functions would be enhanced through re-contouring of the basin to raise the bottom elevation, in conjunction with establishment of a muted tidal connection. The muted tidal connection would be provided through installation of a pipe that would provide the tidal connection.[1] Establishment of more reliable hydrology will allow for introduction of a suite of native coastal salt marsh species set forth in Table 1 below.

Biogeochemical Functions

The current basin exhibits very limited biogeochemical function due to the limited amounts of vegetation. The enhanced basin would support more native vegetation and exhibit minimally higher levels of biogeochemical function.

Functions Related to Habitat

The primary focus of the habitat enhancement will be establishment of coastal salt marsh habitat typical of this region of southern California. The coastal salt marsh would be expected to support invertebrates, vertebrates (e.g. fish), along with a number of avian species including shorebirds, herons and egrets, and waterfowl commonly associated with salt marsh habitats. Provision of a native buffer that includes coastal prairie, coastal sage scrub, coastal bluff scrub and maritime chaparral l elements will enhance the overall habitat value of the saltmarsh area.

C. Time Lapse

Enhancement would begin at the time project construction begins.

D. Estimated Total Cost

Table 1 below is a summary of the estimated cost for implementation including site preparation and plnatings, five-year maintenance, and five-year monitoring of the 0.47 acre saltwater marsh

[1] The location and size of the tidal connection will be determined by a coastal engineer/hydrologist with experience in coastal salt marsh restoration/creation.

and surrounding coastal prairie, coastal sage scrub, coastal bluff scrub and maritime chaparral buffer areas. The cost estimate also includes hardscape that would be incorporated into the park. As described in more detail below, the buffers will be planted with upland species native to the area and the final plant palettes will be determined at the time detailed landscape plans are developed. A detailed breakdown of project costs is included as Appendix A.

TABLE 1 ESTIMATED RESTORATION COST FOR 0.47 ACRE SALTWATER MARSH AND SURROUNDING BUFFER AREA	
Task: Wetland Restoration	Cost
Final Contouring of Basin including establishment of muted tidal connection	N/A*
Mobilization	$2,000
Site Preparation	$440
Irrigation System	$3,840
Plant Installation (includes cost of plants and seed/seed collection)	$8,170
Project Maintenance (30 visits)	$17,800
Project Monitoring (32 visits, annual reports)	$55,460
Wetland Subtotal	$87,710
Task: Upland Buffer Creation	
Mobilization	$3,000
Site Preparation	$660
Irrigation System	$5,750
Plant Installation (includes cost of plants and seed/seed collection)	$16,000
Project Maintenance (30 visits)	$26,800
Project Monitoring (32 visits, annual reports)	$57,360
Upland Buffer Subtotal	$109,570

TABLE 1 ESTIMATED RESTORATION COST FOR 0.47 ACRE SALTWATER MARSH AND SURROUNDING BUFFER AREA	
Task: Non-Habitat Park Elements	
Hardscape Items	$174,300
Irrigation	1,400
Plantings and Maintenance	46,700
Non-Habitat Park Elements Subtotal	$222,400
TOTAL	$419,680

* GLA estimates grading cost for contouring of the wetland basin with tidal connection via a piped inlet to range between $25,000 and $40,000; however, the cost is not included in the table as this needs to be confirmed by the project Civil Engineer. Assuming that GLA's assumptions are accurate, the wetland restoration would cost between $135,000 and $150,000.

III. FINAL SUCCESS CRITERIA

A. Target Functions and Values

Enhancement efforts will result in provision of tidal inundation to the 0.47 acre of restored salt marsh. The restored marsh will exhibit elevations ranging from approximately 0.0 feet MSL (low marsh habitat) up to 5.0+ feet MSL (high marsh habitat). Establishment of a tidal connection will allow colonization by a variety of benthic organisms as well as use by fish, which will in turn attract shorebirds and waterfowl.

B. Target Hydrological Regime

Restoration will include establishment of a "muted" tidal regime through a below grade culverted or piped connection into Marina del Rey Harbor. The muted tidal regime will provide for tidal inundation typical of salt marsh habitats in Southern California.

C. Target Wetland Acreage to be Created/Enhanced

A total of 0.47 acre of coastal salt marsh habitat would be restored.

IV. PROPOSED RESTORATION SITE

A. Location and Size of Restoration Area

The proposed restoration site is located in the southern portion of the site [see Exhibit 4], and covers approximately 0.47 acre of saltwater marsh plantings and 0.73 acre of coastal prairie, coastal sage scrub, coastal bluff scrub and maritime chaparral buffer plantings.

B. Ownership Status

The property is currently owned by the County of Los Angeles.

C. Present and Proposed Uses of Restoration Area

The proposed enhancement area is currently occupied by the degraded wetland basin and adjacent berm that is vegetated with the narrow-leaf willow. The basin currently provides limited hydrologic, biogeochemical and habitat functions typical of "seasonal pond" habitat. Establishment of a "muted" tidal regime would ensure substantially higher functions consistent with coastal salt marsh habitat. To ensure the permanent status of the enhancement area (a total of 0.47 acre) for habitat functions, the applicant will record a restrictive covenant in the form of a conservation easement that will prevent development of the areas proposed for wetland enhancement

D. Jurisdictional Delineation

Data collected within the existing constructed basin [encompassed by the polygons depicted on Exhibit 3], exhibit vegetation, soils and hydrology that are consistent with the presence of wetlands. The wettest area supports alkali bulrush (*Scirpus maritimus*, OBL) and alkali weed (*Cressa truxillensis*, FACW) with the presence of the alkali bulrush as the strongest indicator for wetland conditions. In limited areas, hydric soil indicators appear to have formed in response to current site hydrological conditions including sulfidic odor and low chroma matrix. The areas that exhibit wetland vegetation, soils and hydrology cover approximately 0.26 acre.

Additional areas exhibit positive indicators for hydric soils or hydrophytic vegetation cover approximately 0.21 acre. Combined, the 0.26-acre area that exhibits characteristics consistent with the presence of a three-parameter wetland and 0.21-acre area total of 0.47 acre.

E. Present and Proposed Uses of All Adjacent Areas

Portions of the restoration site currently consist of an artificial wetland basin and willow-dominated berm. The remaining portion of the undeveloped site supports primarily ruderal, with dominant

species in the upland portions including ripgut (*Bromus diandrus*), rattail fescue (*Vulpia myuros*), telegraph weed (*Heterotheca grandiflora*), slender wild oat (*Avena barbata*), hare barley (*Hordeum murinum* ssp. *leporinum*), soft chess (*Bromus hordeaceus*), garland chrysanthemum (*Chrysanthemum coronarium*), cheeseweed (*Malva parviflora*), white-stemmed filaree (*Erodium moschatum*), bur clover (*Medicago polymorpha*), sow-thistle (*Sonchus oleraceus*), small flower iceplant (*Mesembryanthemum nodiflorum*), Australian saltbush (*Atriplex semibaccata*), alkali heliotrope (*Heliotropum curassivicum*), and giant horseweed (*Conyza canadensis*). The surrounding land use is consists of developed areas.

V. IMPLEMENTATION PLAN

A. Rationale for Expecting Implementation Success

Re-contouring of the wetland area, along with establishment of a muted tidal connection, will include final elevations that include areas of low-, mid- and high-marsh elevations (ranging from between 0.0 and 1.0 feet MSL up to approximately 5.0 feet MSL[2]). Upland areas surrounding the basin will be planted with species common to coastal upland habitats such as coastal prairie, coastal sage scrub, coastal bluff scrub and maritime chaparral.

B. Responsible Parties

The applicant or the applicant's successors will be the responsible party.

C. Site Preparation and Invasive Plant Removal

Site preparation will be supervised by a qualified habitat restoration specialist, knowledgeable in coastal salt marsh restoration. Site preparation is to consist of grading necessary to re-contour the wetland area and establishment of elevations that include areas of low-, mid and high-marsh (0.0 feet MSL up to 5.0+ feet MSL). During grading, the seed bank consisting of non-native species will be removed. Grading will be conducted to create the microtopography typically found in coastal salt marsh at the direction of the habitat restoration specialist.

D. Planting Design

Expanded and enhanced coastal salt marsh habitat would be planted within the enhanced wetland area as set forth in Table 2. These species would replace the non-native species removed during

[2] The bottom elevation will be determined by grading and will range between 0.0 and 1.0 feet MSL as noted. The upper elevation will be determined by the size of the pipe that provides the tidal connection and will be determined by a coastal engineer. Salt marsh vegetation will be planted up to an elevation of 6.0 feet; however, these areas will not be inundated except in rare events.

site preparation. The proposed low and mid-marsh species would be planted in zones of appropriate wetness. Variations in microtopography within the basin will allow for establishment of mosaic of coastal salt marsh habitat. Upland areas surrounding the enhanced wetland will be planted with species native to coastal prairie, coastal sage scrub, coastal bluff scrub and maritime chaparral habitats (Tables 3, 4, 5 & 6).

E. Plant Palette

All of the coastal salt marsh plants included in the planting palette (Table 2) are able to tolerate periods of tidal inundation alternating with brief periods of drying. The coastal prairie, coastal sage scrub, coastal bluff scrub and maritime chaparral plantings located in the areas surrounding the wetland area are adapted to seasonally dry conditions of coastal southern California. Initial planting will be accomplished during the fall.

F. Source of Plant Material

Plant materials will be obtained from a local nursery or seed source specializing in the cultivation of native coastal salt marsh plants.

G. Plant Installation

Container stock will be installed by a contractor specializing in the restoration of habitats native to southern California. Planting will be accomplished by digging a hole approximately twice the depth and width of the plant container. The planting hole will be filled with water and allowed to drain prior to planting. A small amount of backfill with be placed in the hole and lightly tamped down prior to placing the container stock. The plant root ball will be placed on the backfill and the area will be backfilled entirely while applying water to the backfill soil.

H. Erosion Control

Appropriate erosion control measures will be used during plant establishment. This will include use of BMPs such as jute netting on slopes to hold soil in place during the establishment period. Erosion control measures will be focused on the basin slope, as significant erosion is not expected to occur within the low-gradient basin floor. Should erosion be observed during site monitoring efforts, corrective measures will be applied.

I. As-Built Conditions

The applicant will submit a report (including site photographs and a narrative that addresses the enhancement/creation activities) to the Coastal Commission Executive Director within 30 days of completion of site preparation and planting, describing as-built status of the Enhancement project.

Table 2
Plant Palette for Restored Coastal Salt Marsh

Plant Species	Container Size	Spacing
Low-Marsh		
California Cord Grass (*Spartina foliosa*)	1 gal	3 foot o.c. (clumped)
Saltwort (*Batis maritima*)	1 gal	6 foot o.c. (scattered)
Mid-Marsh		
Common Pickleweed (*Salicornia virginica)*	1 gal	3 foot o.c. (scattered)
Alkali Heath (*Frankenia salina*)	1 gal	3 foot o.c. (scattered)
Fleshy Jaumea (*Jaumea carnosa)*	1 gal	3 foot o.c. (scattered)
Saltgrass (*Distichlis spicata*)	1 gal	3 foot o.c. (clumped)
Upper-Marsh		
Parish's Saltwort (*Arthrocnemum subterminalis*)	1 gal	3 foot o.c. (perimeter)
Southwestern Spiny Rush (*Juncus acutus leopoldi*)	1 gal	3 foot o.c. (perimeter)

Table 3
Plant Palette for Coastal Prairie

Plant Species	Container Size	Spacing
Container Plants		
Wild hyacinth (*Dichelostema capitatum*)	Rosepots	3 foot o.c. (scattered)
Coastal goldenbush (*Isocoma menziesii*)	1 gal	8 foot o.c. (scattered)
Mesa horkelia (*Horkelia cuneata*)	1 gal	3 foot o.c. (scattered)
Wishbone bush (*Mirabilis californica*)	1 gal	10 foot o.c. (scattered)
Coast range melic (*Melica californica*)	Liners	2 foot o.c. (clumped)
Purple needlegrass (*Nassella pulchra)*	Liners	2 foot o.c. (clumped)
Blue eyed grass (*Sisyrinchium bellum*)	Rosepots	2 foot o.c. (clumped)
Seed Mix		
Bentgrass (*Agrostis pallens*)	seed	
Common goldenstar (*Bloomeria crocea*)	seed	
California goldfields (*Lasthenia californica*)	seed	
Foothill needlegrass (*Nassella lepida*)	seed	
Dot seed plantain (*Plantago erecta*)	seed	
Blue eyed grass (*Sisyrinchium bellum*)	seed	

Table 4
Plant Palette for Coastal Sage Scrub and Coastal Bluff Scrub

Plant Species	Container Size	Spacing
Container Plants		
California sagebrush (*Artemisia californica*)	1 gal	5 foot o.c. (scattered)
Brewer's saltbush (*Atriplexlentiformis breweri*)	1 gal	8 foot o.c. (scattered)
Encelia californica (*Encelia californica*)	1 gal	5 foot o.c. (scattered)
Buckwheat (*Eriogonum fasciculatum*)	1 gal	5 foot o.c. (scattered)
Sea cliff buckwheat (*Eriogonum parvifolium*)	1 gal	6 foot o.c. (scattered)
California Boxthorn (*Lycium californica*)	1 gal	6 foot o.c. (clumped)
Purple needlegrass (*Nassella pulchra)*	Liners	2 foot o.c. (clumped)
Coast prickly pear (*Opuntia prolifera)*	1 gal	8 foot o.c. (clumped)
Lemonade berry (*Rhus integrifolia*)	1 gal	20 foot o.c. (clumped)
Seed Mix		
Wild hyacinth (*Dichelostema capitatum*)	seed	
Buckwheat (*Eriogonum fasciculatum*)	seed	
Foothill needlegrass (*Nassella lepida*)	seed	
Purple needlegrass (*Nassella pulchra*)	seed	
Blue eyed grass (*Sisyrinchium bellum*)	seed	

Table 5
Plant Palette for Maritime Chaparral

Plant Species	Container Size	Spacing
Container Plants		
Big-pod ceanothus (*Ceanothus megacarpus*)	1 gal	8 foot o.c. (scattered)
Little-leaved Redberry (*Rhamnus crocea*)	1 gal	5 foot o.c. (scattered)
Toyon (*Heteromeles arbutifolia*)	1 gal	8 foot o.c. (scattered)
Lemonadeberry (*Rhus integrifolia*)	1 gal	8 foot o.c. (scattered)
Southern California dudleya (*Dudleya lanceolata*)	1 gal	4 foot o.c. (clumped)
California fuschia (*Epilobium canum)*	1 gal	5 foot o.c. (clumped)
Coast Buckwheat (*Eriogonum parviflorum*)	1 gal	5 foot o.c. (clumped)
Fuschia flowering gooseberry (*Ribes speciosum*)	1 gal	10 foot o.c. (scattered)
Seed Mix		
Bentgrass (*Agrostis pallens*)	seed	
Common goldenstar (*Bloomeria crocea*)	seed	
Splendid mariposa lily (*Calochortus splendens*)	seed	
Pink gnaphalium (*Gnaphalium ramosossimum*)	seed	
Collard annual lupine (*Lupinus truncatus*)	seed	

VI. MAINTENANCE DURING MONITORING PERIOD

A. Maintenance Activities

The purpose of this program is to ensure the success of the enhancement/ creation program. Maintenance will occur over the life of the project (five years). As the weed eradication and plant installation is completed, the habitat restoration specialist will schedule a meeting with key members of the landscape maintenance crew in order to identify proper maintenance procedures. The following tasks will be performed as general maintenance duties:

1. Weeding

Weeding will be conducted monthly during the first six months of the project and quarterly during years two through five, or as necessary and as directed by the Project Restoration Specialist. Because the salt marsh habitat will support a predominance of species that are not commonly recognized by landscape contractors, training will be necessary to ensure that target species are not inadvertently removed during weeding. Furthermore, because the non-native seed bank will be removed and tidal inundation will suppress many of the common weeds, the amount of weeding may be very limited and as such will be coordinated by the project biologist.

2. Plant Replacement

Dead or damaged container stock will be replaced during the first year as necessary to ensure compliance with the performance standards.

3. Pruning and Staking

None of the target species will require pruning or staking.

4. Trash Removal

Trash removal will be conducted during weeding and other maintenance visits.

5. Tree Protection

None of the shrub species selected are expected to require special protection.

B. Responsible Parties

The Applicant or its successors will be responsible for financing and carrying out maintenance activities. The applicant may assign the maintenance responsibilities to an appropriate contractor, but will retain ultimate responsibility for maintenance of the Enhancement site.

C. Schedule

As noted, weed control may be limited; however, as determined necessary by the project biologist, weeding will be conducted on an as-needed basis during the dry-phased of the basin during the first season of the project and each following year as needed. As the first season passes into the summer and fall the weed problem is expected to decrease, and, depending on the health and spread of the desired plants, the weed maintenance schedule will likely lighten into the second year of project with a decreasing through the life of the monitoring program.

VII. MONITORING PLAN

Monitoring will focus on characteristics of the coastal salt marsh, coastal prairie, coastal sage scrub, coastal bluff scrub and maritime chaparral.

A. Initial Monitoring Effort

Vegetation will be monitored following installation of the container stock. The initial biological and ecological status of the site will be established and the as-built condition of the site will be documented. Long-term monitoring of the site will begin following this initial assessment.

B. Performance Criteria

The success of a restoration site is defined as the restoration of a functional ecosystem. Success is usually measured by percent coverage by target species. While a fully successful restoration and enhancement plan might be viewed as one that results in 100-percent coverage, such coverage is unlikely. Natural habitats rarely exhibit 100-percent coverage, but rather include a considerable proportion of open spaces.

The means of determining successful restoration for this site will be through series of measurements for native cover and diversity, exotic species cover, and use by resident and non-resident nekton. All of these, except non-native species cover, should increase over time. Cover by non-native species should be the opposite; it should decrease with time, particularly because one of the primary goals of the project is to substantially reduce or eliminate non-native species from the site.

After the initial grading, site preparation, and planting effort has been completed, the Restoration area will be monitored by the project monitor on a monthly basis for the 12 months and quarterly for the remainder of the monitoring period. Qualitative surveys, consisting of a general site walkover and habitat characterization, will be completed during each monitoring visit. General observations, such as fitness and health of the planted species, pest problems, weed persistence/establishment, mortality, and drought stress, will be noted in each site walkover. The Project Monitor will determine remedial measures necessary to facilitate compliance with performance standards.

As habitat for wildlife is a stated Final Success Criteria of this plan, notes regarding wildlife usage will be collected during each visit. Based on current wildlife use of the site as well as the location of the site, it is expected that wildlife use will primarily consist of foraging by shorebirds, herons, egrets and waterfowl.

Quantitative data will be collected annually using accepted vegetative sampling methods in order to evaluate survivorship, species coverage, and species composition.

In the event that plantings should fail to meet the specified requirements, compliance will be ensured by the performance of either or both of the following remedial procedures by the contractor on an as-needed basis as directed by the Project Monitor: (1) replacing unsuccessful plantings with appropriate-sized stock or seed mixes to meet stated cover or survival requirements, and /or (2) performing maintenance procedures to ensure the site conditions are appropriate (e.g., non-native species removal). Remedial actions in planting areas shall be based on detailed investigations (such as soil tests and excavations of failed plantings to examine root development) to determine causes of failure. If substantial non-compliance with the performance occurs, the applicant will consult the California Coastal Commission to determine whether corrective measures and an extension of the five-year monitoring period will be necessary.

Vegetation Performance Standards

Saltwater MarshPlantings

First-Year Monitoring

Success Standard: 30-percent coverage of native species (5-percent deviation allowed);
At least 80-percent of the planted species will be represented in the restoration site;
No more than 10-percent coverage by non-native plant species

Second-Year Monitoring

Success Standard: 40-percent coverage of native species (<5-percent deviation allowed);
At least 80-percent of the planted species will be represented in the

restoration site;
No more than Five-percent coverage by non-native plant species

Third-Year Monitoring

Success Standard: 50-percent coverage of native species (<5-percent deviation allowed);
At least 80-percent of the planted species will each attain at least five-percent cover of the total native cover;
No more than Five-percent coverage by non-native plant species

Fourth-Year Monitoring

Success Standard: 60-percent coverage of native species (<5-percent deviation allowed);
At least 80-percent of the planted species will each attain at least five-percent cover of the total native cover;
No more than Five-percent coverage by non-native plant species

Fifth-Year Monitoring

Success Standard: 75-percent coverage of native species (<5-percent deviation allowed);
At least 80-percent of the planted species will each attain at least five-percent cover of the total native cover;
No more than five-percent coverage by non-native plant species

Coastal Prairie Plantings

First-Year Monitoring

Success Standard: 35-percent coverage of native species (5-percent deviation allowed);
At least 80-percent of the planted species will be represented in the restoration site;
No more than 10-percent coverage by non-native plant species

Second-Year Monitoring

Success Standard: 50-percent coverage of native species (<5-percent deviation allowed);
At least 80-percent of the planted species will be represented in the restoration site;
No more than Five-percent coverage by non-native plant species

Third-Year Monitoring

Success Standard: 60-percent coverage of native species (<5-percent deviation allowed);
At least 80-percent of the planted species will each attain at least five-percent cover of the total native cover;
No more than Five-percent coverage by non-native plant species

Fourth-Year Monitoring

Success Standard: 70-percent coverage of native species (<5-percent deviation allowed);
At least 80-percent of the planted species will each attain at least five-percent cover of the total native cover;
No more than Five-percent coverage by non-native plant species

Fifth-Year Monitoring

Success Standard: 80-percent coverage of native species (<5-percent deviation allowed);
At least 80-percent of the planted species will each attain at least five-percent cover of the total native cover;
No more than five-percent coverage by non-native plant species

Coastal Sage Scrub, Coastal Bluff Scrub and Maritime Chaparral Plantings

First-Year Monitoring

Success Standard: 35-percent coverage of native species (5-percent deviation allowed);
No more than 10-percent coverage by non-native plant species

Second-Year Monitoring

Success Standard: 50-percent coverage of native species (<5-percent deviation allowed);
No more than Five-percent coverage by non-native plant species

Third-Year Monitoring

Success Standard: 60-percent coverage of native species (<5-percent deviation allowed);
No more than Five-percent coverage by non-native plant species

Fourth-Year Monitoring

Success Standard: 70-percent coverage of native species (<5-percent deviation allowed);
No more than Five-percent coverage by non-native plant species

Fifth-Year Monitoring

Success Standard: 80-percent coverage of native species (<5-percent deviation allowed);
No more than five-percent coverage by non-native plant species

C. <u>Monitoring Methods</u>

Monitoring will assess the attainment of annual and final success criteria and identify the need to implement contingency measures in the event of failure. Vegetation monitoring methods include field-sampling techniques that are based upon the California Native Plant Society field sampling

protocol.[3] Please refer to *A Manual of California Vegetation* for further details on this sampling method.

1. Vegetation Monitoring

Vegetation monitoring shall be conducted during the active growing season in September of every year. Monitoring shall be performed by a qualified habitat restoration specialist, biologist, or horticulturist with appropriate credentials and experience in native habitat restoration. Continuity within the personnel and methodology of monitoring shall be maintained insofar as possible to ensure comparable assessments. Records will be kept of mortality and other problems, such as insect damage. Other potential site problems, such as weed infestation and soil loss, will also be identified by the project monitor. Remedial measures undertaken will be referenced in the annual report to the Executive Director of the California Coastal Commission.

Sampling Techniques
Sampling protocols for the restoration area is described below.

Quantitative sampling within the restoration area will be performed using two-decimeter quadrats that will be placed randomly throughout the site. Placement of quadrats will be determined using random numbers tables to provide two coordinates, one that indicates the distance along a longitudinal centerline bisecting the site and one that determines the distance form the line. Plots will be placed on alternating sides of the centerline and perpendicular to the centerline. Vegetative cover will be visually estimated within the quadrat for each species present, and recorded on a data sheet. Any species observed during the sampling that does not fall within a quadrat will be recorded and included on the list of species for the restoration site. At least 30 replicates will be initially sampled. Sample variance from data collection in years one through three will be used to determine if 30 samples is adequate. If a power analysis indicates that more than 30 samples are required, additional transects or quadrats will be added. If power analysis indicates that fewer than 30 samples are required, the number of quadrats will be reduced. Sampling will be conducted with sufficient replication to detect a 10% difference in absolute ground cover between the mean of the restoration and the success standard with 90% power at an alpha level of 0.10. The mean native cover for the restoration site will be compared to the performance criteria at the end of five years using an appropriate inferential test such as a single-sample t-test. The mean cover for the restoration site will be considered to meet the performance criteria if the resulting alpha level is greater than 0.10.

[3] Sawyer, John O. and Todd Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society.

Photo-Documentation
Several permanent stations for photo-documentation of the restoration area will be established. Photos shall be taken each monitoring period from the same vantage point and in the same direction each year, and shall reflect material discussed in the annual monitoring report.

Final Success Criteria Resolution
If the project meets all success criteria at the end of the five-year monitoring period, the habitat creation will be considered a success. If not, the maintenance and monitoring program will be extended one full year at a time and a specific set of remedial measures, approved by the Executive Director of the California Coastal Commission, will be implemented until the standards are met. Only those areas that fail to meet the success criteria will require additional work. This process will continue until all year-five standards are met or until the Executive Director of the California Coastal Commission determines that other re-vegetation measures are appropriate.

Final success criteria will not be considered to have been met until a minimum of three years after all human support (excluding routine weeding), including irrigation, has ceased. Should the re-vegetation effort meet all goals prior to the end of the five-year monitoring period, the Executive Director of the California Coastal Commission, at his discretion, may terminate the monitoring effort.

The permittee recognizes that failure to meet success criteria may result in the requirement to replace that portion of failed Enhancement.

D. <u>Annual Reports</u>

At the end of each of the five monitoring period growing seasons following the "as-built" assessment, an annual report will be prepared for submittal to the Executive Director of the California Coastal Commission. These reports will assess both attainment of yearly target criteria and progress toward final success criteria. These reports will include the following:

- a list of names, titles, and companies of all persons who prepared the content of the annual report and participated in monitoring activities for that year
- an analysis of all qualitative monitoring data
- copies of monitoring photographs
- maps identifying monitoring areas, transects, planting zones, etc. as appropriate.
- copies of all previous reports

E. Schedule

Annual Reports will be submitted by December 31 of each year for the year in which quantitative sampling was performed.

VIII. COMPLETION OF RESTORATION

A. Notification of Completion

When the initial monitoring period is complete, and if the applicant believes final success criteria have been met, the applicant will notify the Executive Director of the California Coastal Commission by submitting a Final Monitoring Report that documents this completion. The final performance monitoring will take place after the five-year monitoring period is complete or after at least three years without remediation or maintenance other than weeding, whichever is longer.

B. Agency Confirmation

Following receipt of the final report, the applicant will, at the request of the Executive Director of the California Coastal Commission, provide access and guidance through the project site to confirm the adequate completion of the habitat creation effort.

C. Contingency Plan

Should any portion of the restoration site fail to meet the final success criteria after the five-year monitoring period, an alternate restoration plan will be developed to compensate for the failed areas. The alternate plan will be submitted to the Coastal Commission for approval within 90 days after submitting the Final Monitoring Report.

s:0668-1a_restoration_plan_112006.doc

Adapted from National Geographic TOPO!

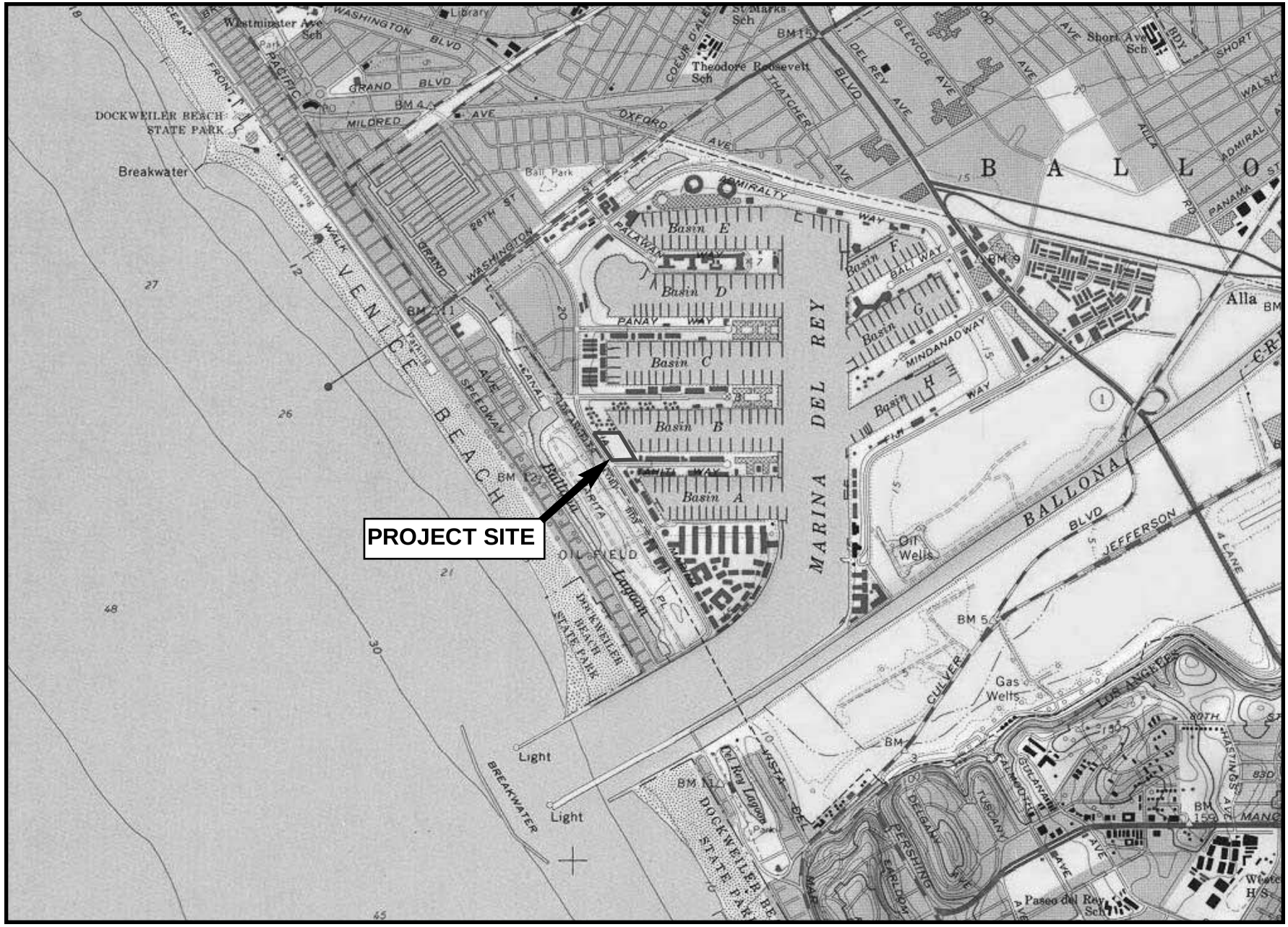
PARCEL 9U

Regional Map

GLENN LUKOS ASSOCIATES

EXHIBIT 1

Adapted from USGS Venice quadrangle



NORTH

0 1000 2000 3000

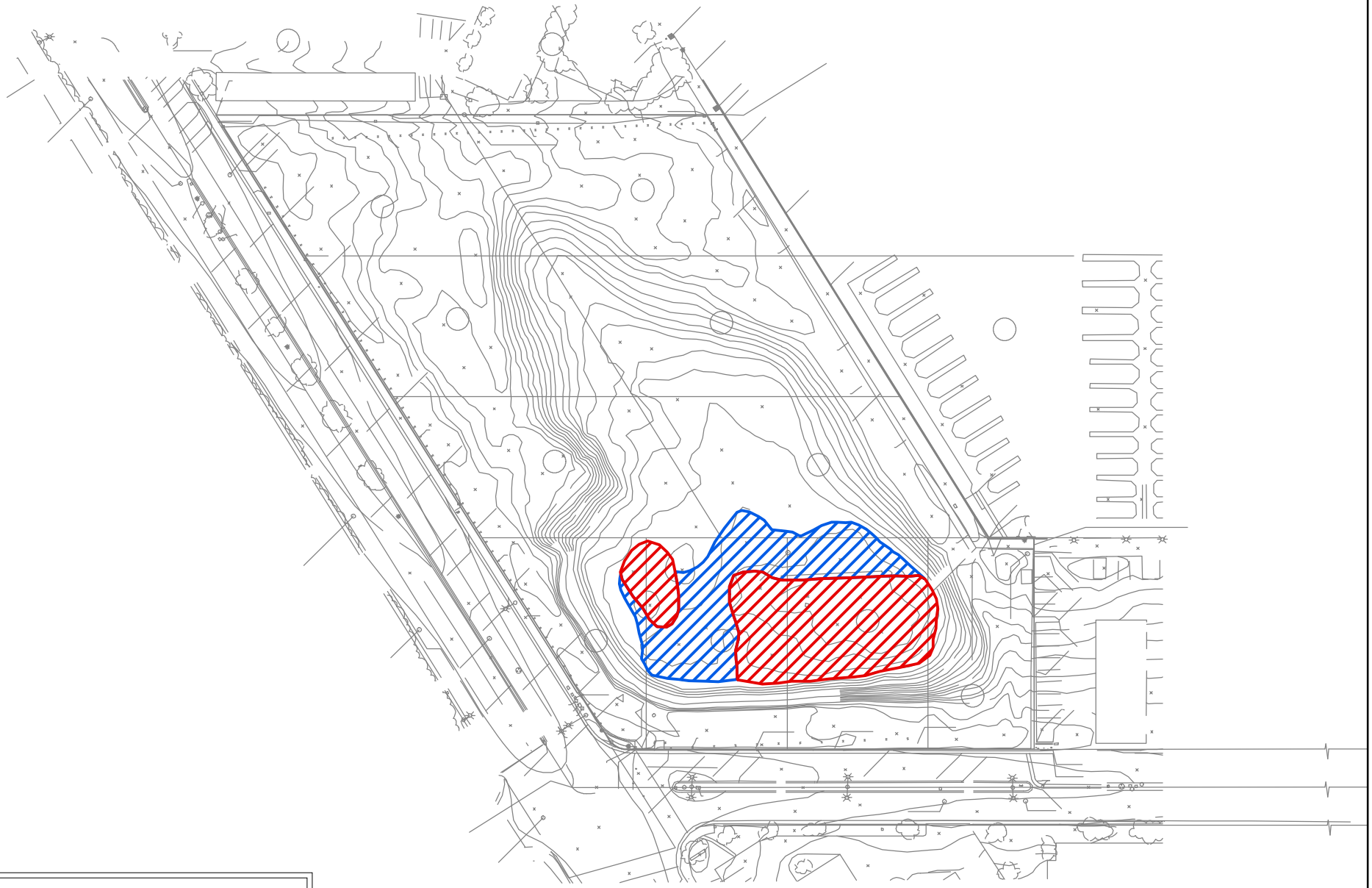
FEET

PARCEL 9U

Vicinity Map

GLENN LUKOS ASSOCIATES

EXHIBIT 2



Wetland Meeting Three Parameters

Areas with Hydric Soils or Indicator Plant Species Lacking Hydrology in Normal Years

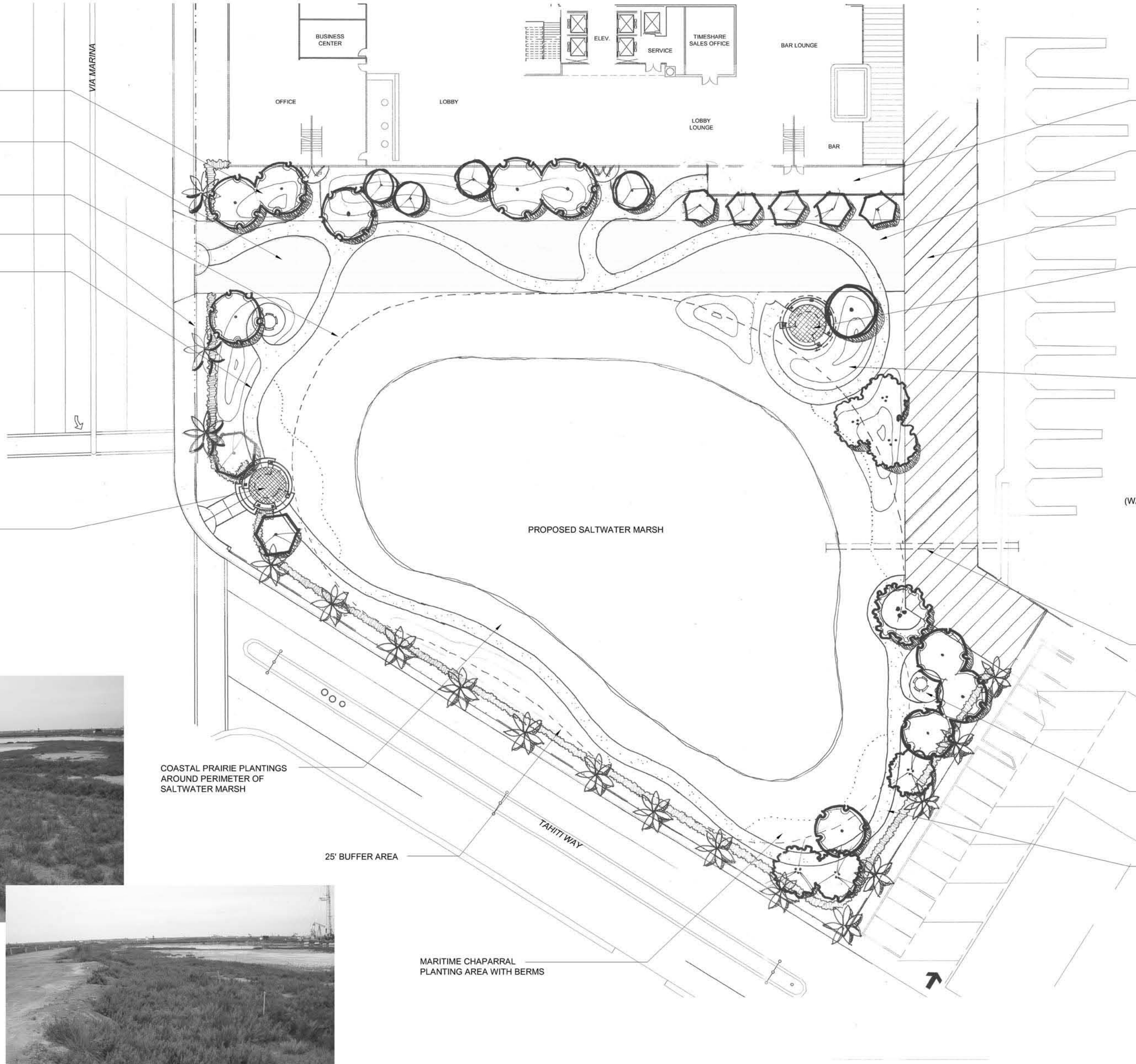
0 100 200
Feet

T:\0363-THE REST\0668-01P9U\0668-01P9U.GIS\668-1 Mitigation.mxd
January 26, 2005

PARCEL 9U MARINA DEL REY

Potential Wetland Areas

GLENN LUKOS ASSOCIATES



COASTAL SAGE SCRUB PLANTING AREAS WITH BERMS

28' WIDE TURFBLOCK FIRE ACCESS ROUTE WITH CONCRETE PEDESTRIAN PATH

PICNIC TABLE/EATING AREA

SCREENING HEDGE

DECOMPOSED GRANITE PATH

PARK ENTRANCE AND EDUCATIONAL GATHERING AREA
- INFORMATIONAL SIGNAGE
- SEATING AREAS
- WOOD OVERHEAD
- VIEWING AREA

OUTDOOR TERRACE

28' WIDE TURFBLOCK FIRE ACCESS ROUTE WITH CONCRETE PEDESTRIAN PATH

28' WIDE FIRELANE AND WATERFRONT PROMENADE PER "WATERFRONT STROLL GUIDELINES"

EDUCATIONAL GATHERING AREA
- INFORMATIONAL SIGNAGE
- SEATING AREAS
- WOOD OVERHEAD

COASTAL BLUFF SCRUB PLANTING AREAS WITH BERMS

CONNECTION TO PROVIDE TIDAL INFLUENCE

PICNIC TABLE/EATING AREA

DECOMPOSED GRANITE PATH

COASTAL PRAIRIE PLANTINGS AROUND PERIMETER OF SALTWATER MARSH

25' BUFFER AREA

MARITIME CHAPARRAL PLANTING AREA WITH BERMS

PHOTOGRAPHS OF CREATED SALTWATER MARSH HABITAT SIMILAR TO HABITAT PROPOSED FOR THE WOODFIN SUITES PARK SITE

16 8 0 16 32 64

GRAPHIC SCALE 1/16" = 1'-0"

WOODFIN SUITES
CONCEPTUAL PARK PLAN

0868-01P9U:cad files\Concept Plan 040306.dwg

BIOLOGICAL TECHNICAL REPORT
PARCEL 9U, MARINA DEL REY, CALIFORNIA

PREPARED FOR

WOODFIN SUITE HOTELS
12730 HIGH BLUFF DRIVE
SAN DIEGO, CALIFORNIA 92130

PREPARED BY

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DRAFT, JANUARY 2006
[REVISED NOVEMBER 2006]

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I. INTRODUCTION

Glenn Lukos Associates, Inc. (GLA) conducted a biological evaluation of the Parcel 9U project site in order to determine whether the site supports, or exhibits potential to support, state or federally listed threatened or endangered species or other special-status species or vegetation communities. The biological evaluation included a review of the California Natural Diversity Database (CNDDB) as well as other general and focused plant and animal surveys.

The site was also evaluated for the presence of areas subject to the jurisdiction of the U.S. Army Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act, the Regional Water Quality Control Board pursuant to Section 401 of the Clean Water Act, the California Department of Fish and Game pursuant to Section 1602 of the California Fish and Game Code, and the California Coastal Commission. The results of the jurisdictional delineation are also included in a letter report prepared by GLA[1].

This report includes a project description, methodologies, list of target sensitive species that have the potential to occur on site, results of project surveys, and a discussion of potential direct and indirect impacts to sensitive biological resources that would results from project development of Parcel 9U.

II. PROJECT AND PROPERTY DESCRIPTION

The 3.8-acre Parcel 9U is located in the City of Marina Del Rey, Los Angeles County, California [USGS 7.5' Venice, California quadrangle map at Township 2S, Range 15W, unsectioned], [Exhibit 1 – Regional Map]. The project is located north of Tahiti Way, west of Basin B of Marina Del Rey, east of Via Marina, and south of a residential development [Exhibit 2 – Vicinity Map]. According to the U.S. Geological Survey (USGS) topographic map of Venice, California [dated 1964 and photorevised in 1981], the Project area supports no blue-line streams. Adjoining properties consist of residential development and Basin B of Marina Del Rey.

The property consists of an empty lot vegetated primarily with upland ruderal species. The south side of the parcel includes an excavated depression that supports a mixture of native and exotic plant species. The southern margin of the basin consists of a berm made up of spoil materials excavated from the basin. The berm supports narrow-leaved willow (*Salix exigua*). The proposed project includes the construction of a hotel on the northern section of the property.

Vegetation

The dominant vegetation on the 3.8-acre Parcel 9U property is primarily ruderal, with dominant species in the upland portions including ripgut (*Bromus diandrus*), rattail fescue (*Vulpia myuros*), telegraph weed (*Heterotheca grandiflora*), slender wild oat (*Avena barbata*), hare barley (*Hordeum murinum* ssp. *leporinum*), soft chess (*Bromus hordeaceus*), garland chrysanthemum (*Chrysanthemum coronarium*), seaside heliotrope (*Heliotropum curassivicum*), cheeseweed (*Malva*

[1] Glenn Lukos Associates. Revised November 20, 2006. Letter Report to Mr. Mark Rousseau, Subject: Jurisdictional Wetland Status of Parcel 9U, Marina Del Rey, Los Angeles County, California.

parviflora), white-stemmed filaree (*Erodium moschatum*), bur clover (*Medicago polymorpha*), sow-thistle (*Sonchus oleraceus*), small flower iceplant (*Mesembryanthemum nodiflorum*), Australian saltbush (*Atriplex semibaccata*), alkali heliotrope (*Heliotropum curassivicum*), and giant horseweed (*Conyza canadensis*). Dominant species in the excavated area include alkali weed (*Cressa truxillensis*), five-hook bassia (*Bassia hyssopifolia*), sickle grass (*Parapholis incurva*), red brome (*Bromus madritensis* ssp. *rubens)*, Bermuda grass (*Cynodon dactylon*), toad rush (*Juncus bufonius*), and alkali bulrush (*Scirpus maritimus*). The berm is dominated by narrow leaf willow (*Salix exigua*), with an understory of yellow sweet clover (*Melilotus officianalis*) and slender wild oat.

Wildlife

Avifauna observed on site include Say's phoebe (*Sayornis saya*), black phoebe (*Sayornis nigricans*), Anna's hummingbird (*Calypte anna*), mallard (*Anas platyrhynchos*), belted kingfisher (*Ceryle alcyon*), green heron (*Butorides virescens*), American crow (*Corvus brachyrhynchos*), European starling (*Sturnus vulgaris*), ruby-crowned kinglet (*Regulus calendula*), northern mockingbird (*Mimus polyglottos*), house finch (*Carpodacus mexicanus*), yellow-rumped warbler (*Dendroica coronata*), and bushtit (*Psaltriparus minimus*).

No reptiles or amphibians were observed on site during general biological surveys.

No mammals were observed on site during general biological surveys.

III. METHODOLOGY OF BIOLOGICAL SURVEYS AND JURISDICTIONAL DELINEATION

Biologists from GLA visited the project site to perform the following tasks: (1) general reconnaissance and vegetation mapping; (2) floristic plant surveys; (3) general wildlife surveys; (4) focused surveys for special-status plants and animals; (5) protocol surveys for listed animals; and (6) delineation of areas subject to the jurisdiction of the Corps pursuant to Section 404 of the Clean Water Act and CDFG jurisdiction pursuant to Division 2, Chapter 6, Section 1600 of the Fish and Game Code. Observations of all plant and wildlife species were recorded during each of the above-mentioned survey efforts. A floral compendium is attached as Appendix A and a list of the wildlife observed on site is attached as Appendix B. The 90-Day Report Of Wet-Season Vernal Pool Branchiopod Sampling is attached as Appendix C. The Jurisdictional Delineation is Appendix D and is bound as a stand-alone document.

Literature Review

Sensitive biological resources present, or potentially present, were identified through a literature review using the following sources: U.S. Fish and Wildlife Service (USFWS 1997 through 2002), California Department of Fish and Game (CDFG 1988 through 2002), California Natural Diversity Database (CNDDB 2004), for the Venice quadrangle, and the California Native Plant Society (Tibor et al. 2001). Sensitive species reported in the project vicinity were noted and the project site was evaluated for the potential to support such species. The USDA Soil Conservation Service's (SCS)

soil map was consulted to verify the soils that occur on site. Field guides and other literature pertinent to the project area were also consulted, and are referenced below.

Vegetation Mapping

Vegetation associations were mapped based upon descriptions provided by Sawyer and Keeler-Wolf (1995) and Holland (1986) with, as appropriate, modifications to more accurately characterize on site conditions [Exhibit 3 – Vegetation Map].

Botanical Surveys

A GLA botanist conducted general vegetation surveys of the site on July 18, September 22, and December 1, 2004; focused surveys for special-status plants on the site on January 23, February 13, and June 16, 2005; and again on June 2, June 15, July 27, and August 1, 2006. The site was covered on foot in a manner that allowed for visual examination of the entire site. All species of plants observed on the site were recorded in field notes during each visit. A complete list of the plant species observed during the surveys is provided in Appendix A.

Fieldwork was coordinated throughout the season with the blooming periods, site-specific habitat conditions, and vegetation associates of the target species.

Wildlife Surveys

A GLA wildlife biologist conducted general wildlife surveys on July 18, October 22, and December 1, 2004. Focused surveys for special-status animals on the site were conducted on January 23, February 13, June 16, 2005; as well as June 2, June 15, and August 1, 2006. The site was covered on foot in a manner that allowed for visual examination of the entire site. All animal species observed on the site were recorded in field notes during each visit. Wildlife species were detected during field surveys by sight, call, tracks, and scat. A complete list of wildlife species detected during the surveys is provided in Appendix B.

USFWS Protocol Surveys

Because of the presence of seasonal ponding within the excavated depression, USFWS protocol surveys for listed anostracan species were performed by Frank Wegscheider (Permit # TE-038716-0). See Appendix C for a complete report of the protocol surveys.

Historical Photograph Analysis

In order to better understand the current site conditions and how previous activities have altered the site, GLA conducted an analysis of historic aerial photographs of the site in conjunction with a review of the history of the site covering the period between 1927 and the present. This historical review includes a review of previous documentation that addresses soil/geological conditions on the site and interviews with local experts who have conducted geotechnical investigations during the

previous five decades. A detailed review of the site history is provided in the Jurisdictional Delineation Report [Appendix D].

Jurisdictional Delineation

On August 18, October 22, November 3, and December 1, 2004; January 14, 2005; and June 2 and 15, 2006 regulatory specialists of Glenn Lukos Associates, Inc. (GLA) examined the project site to determine potential presence of (1) Corps jurisdiction pursuant to Section 404 of the Clean Water Act, (2) CDFG jurisdiction pursuant to Division 2, Chapter 6, Section 1600 of the Fish and Game Code, and (3) any wetlands as defined by the California Coastal Commission. The jurisdictional delineation report is attached as Appendix D. A map depicting wetland areas is provided as Exhibit 4.

Methodology

Prior to beginning the field delineation a 200-scale aerial photograph and 100-scale base topographic map of the property, were evaluated along with previous constraints reports prepared by PCR Services and EDAW to determine the locations of potential areas of Corps/CDFG jurisdiction and CCC-defined wetlands. Suspected jurisdictional areas were field checked for the presence of wetland vegetation, soils and hydrology using the methodology set forth in the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual[2] (Wetland Manual). While in the field, the vegetation, soils, and hydrology field data were recorded onto wetland data sheets, and data collection locations were recorded onto a 100-scale base topographic map using visible landmarks.

As noted above, site visits were conducted on August 18, October 22, November 3, and December 1, 2004, with the October 22 and November 3 visits timed to evaluate the site within seven days of significant rainfall events, providing for optimal conditions for evaluating wetland hydrology. A succession of winter storms during late December and early January, which ended on January 10, 2005, resulted in record rainfall for a 15-day period. This period of rainfall that accounted for approximately 15 inches, and resulted in inundation of the depression. For purposes of determining wetland hydrology, this period does not represent a “normal” or “average” rainfall year and is not suitable for making a positive determination for wetland hydrology. As such, the limits of jurisdictional wetlands (or potential wetlands) discussed below are based on the data collected prior to the storms of late December and early January 2004/05. Survey visits during 2006, particularly visits on June 2, June 15, and August 1 2007 focused on areas that support seaside heliotrope as this species can be an indicator of wetlands as described in Memorandum prepared by GLA dated June 20, 2006.[3] During all 2006 visits, floral and faunal elements were recorded as observed.

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[2] Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experimental Station, Vicksburg, Mississippi.

[3] Glenn Lukos Associates. June 20, 2006. Memorandum addressing: Occurrences of Seaside Heliotrope (*Heliotropum curassivicum*) at Parcel 9U, Marina del Rey, California [Included as Appendix B to GLA Jurisdictional Delineation Report referenced in footnote 1 above].

Federal Regulatory Setting

U.S. Army Corps of Engineers

1. Section 404 of the Clean Water Act

Pursuant to Section 404 of the Clean Water Act, the Corps regulates the discharge of dredged and/or fill material into waters of the United States. The term "waters of the United States" is defined in Corps regulations at 33 CFR Part 328.3(a) as:

> *(1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;*
> *(2) All interstate waters including interstate wetlands;*
> *(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect foreign commerce including any such waters:*
> > *(i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or*
> > *(ii) From which fish or shell fish are or could be taken and sold in interstate or foreign commerce; or*
> > *(iii) Which are used or could be used for industrial purpose by industries in interstate commerce...*
> *(4) All impoundments of waters otherwise defined as waters of the United States under the definition;*
> *(5) Tributaries of waters identified in paragraphs (a) (1)-(4) of this section;*
> *(6) The territorial seas;*
> *(7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) (1)-(6) of this section.*
>
> *Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 123.11(m) which also meet the criteria of this definition) are not waters of the United States.*

In the absence of wetlands, the limits of Corps jurisdiction in non-tidal waters, such as intermittent streams, extend to the OHWM which is defined at 33 CFR 328.3(e) as:

> *...that line on the shore established by the fluctuation of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*

The term “wetlands” (a subset of “waters of the United States”) is defined at 33 CFR 328.3(b) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support...a prevalence of vegetation typically adapted for life in saturated soil conditions." In 1987 the Corps published a manual to guide its field personnel in determining jurisdictional wetland boundaries. The methodology set forth in the 1987 Wetland Delineation Manual generally requires that, in order to be considered a wetland, the vegetation, soils, and hydrology of an area exhibit at least minimal hydric characteristics. While the manual provides great detail in methodology and allows for varying special conditions, a wetland should normally meet each of the following three criteria:

- more than 50 percent of the dominant plant species at the site must be typical of wetlands (i.e., rated as facultative or wetter in the National List of Plant Species that Occur in Wetlands[4]);

- soils must exhibit physical and/or chemical characteristics indicative of permanent or periodic saturation (e.g., a gleyed color, or mottles with a matrix of low chroma indicating a relatively consistent fluctuation between aerobic and anaerobic conditions); and

- hydrologic characteristics must indicate that the ground is saturated to within 12 inches of the surface for at least five percent of the growing season during a normal rainfall year[5].

a. Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, et al.

Pursuant to Article I, Section 8 of the U.S. Constitution, federal regulatory authority extends only to activities that affect interstate commerce. In the early 1980s the Corps interpreted the interstate commerce requirement in a manner that restricted Corps jurisdiction on isolated (intrastate) waters. On September 12, 1985, EPA asserted that Corps jurisdiction extended to isolated waters that are used or could be used by migratory birds or endangered species, and the definition of “waters of the United States” in Corps regulations was modified as quoted above from 33 CFR 328.3(a).

On January 9, 2001, the Supreme Court of the United States issued a ruling on *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, et al.* (SWANCC). In this case the Court was asked whether use of an isolated, intrastate pond by migratory birds is a sufficient interstate commerce connection to bring the pond into federal jurisdiction of Section 404 of the Clean Water Act.

The written opinion notes that the court’s previous support of the Corps’ expansion of jurisdiction beyond navigable waters (*United States v. Riverside Bayview Homes, Inc.*) was for a

[4] Reed, P.B., Jr. 1988. National List of Plant Species that Occur in Wetlands. U.S. Fish and Wildlife Service Biological Report 88(26.10).

[5] For most of low-lying southern California, five percent of the growing season is equivalent to 18 days.

wetland that abutted a navigable water and that the court did not express any opinion on the question of the authority of the Corps to regulate wetlands that are not adjacent to bodies of open water. The current opinion goes on to state:

> *In order to rule for the respondents here, we would have to hold that the jurisdiction of the Corps extends to ponds that are not adjacent to open water. We conclude that the text of the statute will not allow this.*

Therefore, we believe that the court's opinion goes beyond the migratory bird issue and says that no isolated, intrastate water is subject to the provisions of Section 404(a) of the Clean Water Act (regardless of any interstate commerce connection). However, the Corps and EPA have issued a joint memorandum which states that they are interpreting the ruling to address only the migratory bird issue and leaving the other interstate commerce clause nexuses intact.

b. Adjacency and Adjacent Wetlands

As noted in Paragraph 7 of 33 CFR 328.3, the Corps regulates wetlands that are adjacent to other jurisdictional waters. Corps regulations define adjacent to mean "bordering, contiguous, or neighboring" and further state: "Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes and the like are 'adjacent wetlands'. It should be noted that the courts have interpreted the 'criterion' for adjacency broadly, and found that wetland were 'adjacent' even when separated by substantial distances or by substantial barriers. For example, one court found adjacency for lots one-half-mile from a navigable water and in another instance where a wetland was separated from a navigable water by a fifty-foot-wide paved street.

2. Section 10 of the Rivers and Harbors Act

Pursuant to Section 10 of the Rivers and Harbors Acts of 1899 (33 U.S.C. 403), the Corps regulates any obstruction or alteration to navigable waters of the United States. Navigable waters of the Pacific Ocean extend to the line on the shore reached by the mean of the higher high waters (MHHW)[6]. The MHHW reaches an elevation of about 3.0 feet near Marina del Rey.

[6] Corps of Engineers. Los Angeles District. November 29, 1972. Public Notice Relative to Navigable Waters Within the Los Angeles District.

State of California Regulatory Setting

A. <u>California Coastal Commission - California Coastal Act</u>

1. California Coastal Act Wetland Definitions and Policy Guidance

The CCC regulates the diking, filling, or dredging of wetlands within the coastal zone. Section 30121 of the Coastal Act defines "wetlands" as land "*which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens.*" The 1981 CCC Statewide Interpretive Guidelines state that hydric soils and hydrophytic vegetation "*are useful indicators of wetland conditions, but the presence or absence of hydric soils and/or hydrophytes alone are not necessarily determinative when the Commission identifies wetlands under the Coastal Act. In the past, the Commission has considered all relevant information in making such determinations and relied upon the advice and judgment of experts before reaching its own independent conclusion as to whether a particular area will be considered wetland under the Coastal Act. The Commission intends to continue to follow this policy.*"

The 1981 CCC Statewide Interpretive Guidelines define riparian habitats as areas of riparian vegetation. Riparian vegetation is defined as "*an association of plant species which grows adjacent to freshwater watercourses, including perennial and intermittent streams, lakes, and other bodies of fresh water.*" Riparian habitats may encompass wetland areas, but may also extend beyond those areas.

As discussed above (and below), areas regulated by the Corps, CCC, and CDFG are often not coincident due to the differing goals of the respective regulatory programs and also because these agencies use different definitions for determining the extent of wetland areas. For example, the Corps requires that positive indicators for the presence of wetland hydrology, hydric soils, and a predominance of hydrophytic vegetation be present for an area to meet the Corps' wetland definition. The Coastal Commission does not necessarily require that indicators for wetland hydrology, hydric soils, and a predominance of hydrophytic vegetation be present for an area to be determined to by a "wetland"; rather, the presence of hydric soils in the absence of a predominance of hydrophytes (or vice versa) could be sufficient for a positive wetland determination.

2. California Coastal Act – Environmentally Sensitive Habitat Areas

The California Coastal Act (California Public Resources Code Division 20, Section 30240a) restricts land uses within or adjacent to environmentally sensitive habitat areas (ESHAs).[7] The Coastal Act Section 30107.5 defines an ESHA as:

[7] Although ESHA policies do not exist within the LCP, this report elaborates on ESHA policies simply to demonstrate that the evidence does not suggest this area constitutes ESHA.

> *…any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.*

Included within this definition are wetlands, estuaries, streams, riparian habitats, lakes, and portions of open coastal waters, which meet the rare or valuable habitat criteria. Not all wetlands necessarily meet the "rare or valuable habitat criteria" and as set forth in Section 30233, "where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects" degraded or low-value wetlands that do not which meet the rare or valuable habitat criteria may be subject to restoration in accordance with Section 30233.7.

B. <u>Regional Water Quality Control Board</u>

Subsequent to the SWANCC decision, the Chief Counsel for the State Water Resources Control Board issued a memorandum that addressed the effects of the SWANCC decision on the Section 401 Water Quality Certification Program.[8] The memorandum states:

> *California's right and duty to evaluate certification requests under section 401 is pendant to (or dependent upon) a valid application for a section 404 permit from the Corps, or another application for a federal license or permit. Thus if the Corps determines that the water body in question is not subject to regulation under the COE's 404 program, for instance, no application for 401 certification will be required…*
>
> *The SWANCC decision does not affect the Porter Cologne authorities to regulate discharges to isolated, non-navigable waters of the states….*
>
> *Water Code section 13260 requires "any person discharging waste, or proposing to discharge waste, within any region that could affect the waters of the state to file a report of discharge (an application for waste discharge requirements)." (Water Code § 13260(a)(1) (emphasis added).) The term "waters of the state" is defined as "any surface water or groundwater, including saline waters, within the boundaries of the state." (Water Code § 13050(e).) The U.S. Supreme Court's ruling in SWANCC has no bearing on the Porter-Cologne definition. While all waters of the United States that are within the borders of California are also waters of the state, the converse is not true—waters of the United States is a subset of waters of the state. Thus, since Porter-Cologne was enacted California always had and retains authority to regulate discharges of waste into any waters of the state, regardless of whether the COE has concurrent jurisdiction under section 404. The fact that often Regional Boards opted to regulate discharges to, e.g., vernal pools, through the 401 program in lieu of or in addition to issuing*

[8] Wilson, Craig M. January 25, 2001. Memorandum addressed to State Board Members and Regional Board Executive Officers.

> *waste discharge requirements (or waivers thereof) does not preclude the regions from issuing WDRs (or waivers of WDRs) in the absence of a request for 401 certification….*

Thus, discharge of fill material into waters of the State that do not fall under the jurisdiction of the Corps pursuant to Section 404 of the Clean Water Act, may require authorization through application for waste discharge requirements (WDRs) or through waiver of WDRs.

C. California Department of Fish and Game

Pursuant to Division 2, Chapter 6, Sections 1600-1603 of the California Fish and Game Code, the CDFG regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake, which supports fish or wildlife.

CDFG defines a "stream" (including creeks and rivers) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having surface or subsurface flow that supports or has supported riparian vegetation." CDFG's definition of "lake" includes "natural lakes or man-made reservoirs."

CDFG jurisdiction within altered or artificial waterways is based upon the value of those waterways to fish and wildlife. CDFG Legal Advisor has prepared the following opinion:

- Natural waterways that have been subsequently modified and which have the potential to contain fish, aquatic insects and riparian vegetation will be treated like natural waterways...

- Artificial waterways that have acquired the physical attributes of natural stream courses and which have been viewed by the community as natural stream courses, should be treated by [CDFG] as natural waterways...

- Artificial waterways without the attributes of natural waterways should generally not be subject to Fish and Game Code provisions...

Thus, CDFG jurisdictional limits closely mirror those of the Corps. Exceptions are CDFG's exclusion of isolated wetlands (those not associated with a river, stream, or lake), the addition of artificial stock ponds and irrigation ditches constructed on uplands, and the addition of riparian habitat supported by a river, stream, or lake regardless of the riparian area's federal wetland status.

As with Corps jurisdiction, the limits of CDFG jurisdiction were determined in the field, and if present, were mapped on a 200-scale topographic map.

IV. SPECIES EVALUATED IN THIS STUDY

Special-Status Flora

Table 1 provides a list of special-status plants that have been documented to occur in the vicinity of the site and that were considered during general biological surveys (in some instances the occurrences are historical and the species have been extirpated). Plants were selected for consideration primarily through review of the November 2004 CNDDB and the 2001 CNPS inventory. See the Results Section for discussion of all special-status plants that occur on site or have the potential to occur on site

Table 1. Special-status plant species considered for this report

Species Name	Status	Habitat Requirements	Potential for Occurrence
Ballona cinquefoil *Potentilla multijuga*	Federal: None State: None CNPS: List 1A	Brackish meadows; apparently extinct	Not expected to occur on site due to the lack of suitable habitat.
Beach spectaclepod *Dithrea maritima*	Federal: None State: ST CNPS: List 1B	Coastal dunes and coastal scrub	Not expected to occur on site due to the lack of suitable habitat.
Brand's phacelia *Phacelia stellaris*	Federal: None State: None CNPS: List 1B	Coastal dunes and coastal sage scrub.	Not expected to occur on site due to the lack of suitable habitat.
Coastal dunes milk-vetch *Astragalus tener* var. *titi*	Federal: FE State: FE CNPS: List 1B	Coastal bluff scrub and coastal dunes.	Not expected to occur on site due to the lack of suitable habitat.
Coulter's goldfields *Lasthenia glabrata* ssp. *coulteri*	Federal: None State: None CNPS: List 1B	Playas, vernal pools, marshes and swamps (coastal salt).	Marginally suitable habitat present on site.
Estuary seablite *Suaeda esteroa*	Federal: None State: None CNPS: List 1B	Coastal salt marsh and swamps. Occuring in sandy soils	Marginally suitable habitat present on site
Mud nama *Nama stenocarpum*	Federal: None State: None CNPS: List 2	Marshes and swamps.	Marginally suitable habitat present on site.
Orcutt's pincushion *Chaenactis glabriuscula* var. *orcuttiana*	Federal: None State: None CNPS: List 1B	Coastal bluff scrub (sandy soils) and coastal dunes.	Not expected to occur on site due to the lack of suitable habitat.
Parish's brittlescale *Atriplex parishii*	Federal: None State: None CNPS: List 1B	Chenopod scrub, playas, vernal pools.	Not expected to occur on site due to the lack of suitable habitat.

Species Name	Status	Habitat Requirements	Potential for Occurrence
Prostrate navarretia *Navarretia prostrata*	Federal: FSC State: None CNPS: List 1B	Coastal sage scrub, valley and foothill grassland (alkaline), vernal pools. Occurring in mesic soils.	Marginally suitable habitat present on site.
San Fernando Valley spineflower *Chorizanthe parryi* var. *fernandina*	Federal: Candidate State: Candidate CNPS: List 1B	Coastal sage scrub, occurring on sandy soils.	Not expected to occur on site due to the lack of suitable habitat.
Salt spring checkerbloom *Sidalcea neomexicana*	Federal: None State: None CNPS: List 2	Mesic, alkaline soils in chaparral, coastal sage scrub, lower montane coniferous forest, Mojavean desert scrub, and playas.	Not expected to occur on site due to the lack of suitable habitat.
Salt marsh bird's-beak *Cordylanthus maritimus* ssp. *maritimus*	Federal: FE State: SE CNPS: List 1B	Coastal dune, coastal salt marshes and swamps.	Not expected to occur on site due to the lack of suitable habitat.
South coast saltscale *Atriplex pacifica*	Federal: None State: None CNPS: List 1B	Coastal bluff scrub, coastal dunes, coastal sage scrub, playas.	Not expected to occur on site due to the lack of suitable habitat.
Southern tarplant *Centromadia parryi* ssp. *australus*	Federal: None State: None CNPS: List 1B	Disturbed habitats, margins of marshes and swamps, vernally mesic valley and foothill grassland, vernal pools.	Not expected to occur based on lack of detection during three years of surveys.
Ventura Marsh milk-vetch *Astragalus pycnostachyus* var. *lanosissimus*	Federal: FE State: SE CNPS: List 1B	Coastal salt marsh within reach of high tide or protected by barrier beaches; more rarely near seeps on sandy bluffs.	Not expected to occur on site due to the lack of suitable habitat.

Federal
FE-Federally Endangered
FT-Federally Threatened

State
SE-State Endangered
ST-State Threatened

CNPS
List 1B - Plants rare, threatened, or endangered in California.
List 2 - Plants rare, threatened, or endangered in California, but more common elsewhere.
List 3 - Plants about which more information is needed.

Special-Status Wildlife

Table 2 provides a list of special-status wildlife species that have been documented to occur in the vicinity of the site and that were considered during general biological surveys (in some instances the occurrences are historical and the species have been extirpated). Wildlife species were selected for consideration primarily through review of the November 2004 CNDDB. See the Results Section for discussion of all special-status wildlife species that occur on site or have the potential to occur on site.

Table 2. Special-status wildlife species considered for this report

Species Name	Status	Habitat Requirements	Potential for Occurrence
Belding's savannah sparrow *Passerculus sandwichensis beldingi*	Federal: None State: SE CDFG: CSC	Coastal Marshes. Nests in pickleweed in tidal margins.	Not expected to occur on site due to the lack of suitable habitat.
Belkin's dune tabanid fly *Brennania belkini*	Federal: None State: None CDFG: None	Coastal sand dunes	Not expected to occur on site due to the lack of suitable habitat.
Burrowing owl *Athene cunicularia*	Federal: FSC State: None CDFG: CSC	Shortgrass prairies, grasslands, lowland scrub, agricultural lands (particularly rangelands), coastal dunes, desert floors, and some artificial, open areas as a year-long resident. Occupies abandoned ground squirrel burrows as well as artificial structures such as culverts and underpasses.	Not expected to occur on site due to the lack of suitable habitat.
California black rail *Laterallus jamaicensis coturniculus*	Federal: None State: ST CDFG: None	Occurs in coastal saltmarsh and brackish marsh dominated by pickleweed.	Not expected to occur on site due to the lack of suitable habitat.
California least tern *Sterna antillarum browni*	Federal: FE State: SE CDFG: CFP	Occurs near estuaries, bays, or harbors where fish is abundant. Breeds colonially on flat, sparsely vegetated substrates near the coast, including sandy beaches, alkali flats, land fills, and paved areas.	Marginally suitable breeding habitat is present on site. A single individual was observed during "flyover" on June 2, 2006.
Coastal California gnatcatcher *Polioptila californica californica*	Federal: FT State: None CDFG: CSC	Low elevation coastal sage scrub and coastal bluff scrub.	Not expected to occur on site due to the lack of suitable habitat.
Dorothy's El Segundo dune weevil *Trigonoscuta dorothea dorothea*	Federal: None State: None CDFG: None	Coastal sand dunes	Not expected to occur on site due to the lack of suitable habitat.
El Segundo blue butterfly *Euphilotes battoides allyni*	Federal: FE State: None CDFG: None	Coastal sand dunes. Hostplant is *Eriogonum parviflorum*.	Not expected to occur on site due to the lack of host plant and suitable dune habitat.

Species Name	Status	Habitat Requirements	Potential for Occurrence
Globose dune beetle *Coelus globosus*	Federal: None State: None CDFG: None	Coastal sand dunes.	Not expected to occur on site due to the lack of suitable habitat.
Henne's eucosman moth *Eucosma hennei*	Federal: None State: None CDFG: None	Coastal sand dunes. Larval foodplant is *Phacelia ramosissima* var *austrolitoralis*; larvae can be found on woody stems and upper root parts.	Not expected to occur on site due to the lack of larval food plant and suitable dune habitat.
Lange's El Segundo dune weevil *Onychobaris langei*	Federal: None State: None CDFG: None	Coastal sand dunes	Not expected to occur on site due to the lack of suitable habitat.
Mimic tryonia *Tryonia imitator*	Federal: None State: None CDFG: None	Coastal lagoons, estuaries, and salt marshes.	Not expected to occur on site due to the lack of suitable habitat.
Monarch butterfly (wintering) *Danaus plexippus*	Federal: None State: None	Roosts in winter in wind-protected tree groves along the California coast from northern Mendocino to Baja California, Mexico.	Not expected to occur on site due to the lack of suitable habitat.
Pacific pocket mouse *Perognathus longimembris pacificus*	Federal: FE State: None CDFG: CSC	Fine, alluvial soils along the coastal plain. Scarcely in rocky soils of scrub habitats.	Not expected to occur on site due to the lack of suitable habitat.
Riverside fairy shrimp *Streptocephalus woottoni*	Federal: FE State: None CDFG: None	Restricted to deep seasonal vernal pools, vernal pool-like ephemeral ponds, and stock ponds.	Not expected to occur on site due to the lack of suitable habitat.
San Diego fairy shrimp *Branchinecta sandiegonensis*	Federal: FE State: None CDFG: CSC	Seasonal vernal pools	Not expected to occur on site due to the lack of suitable habitat.
Sandy beach tiger beetle Cicindela hirticollis gravida	Federal: None State: None CDFG: None	Coastal sand dunes	Not expected to occur on site due to the lack of suitable habitat.
Southern steelhead - southern California ESU *Oncorhynchus mykiss irideus*	Federal: FE State: None CDFG: CSC	Clear, swift moving streams with gravel for spawning. Federal listing refers to populations from Santa Maria river south to southern extent of range (San Mateo Creek in San Diego county.)	Not expected to occur on site due to the lack of suitable habitat.

Species Name	Status	Habitat Requirements	Potential for Occurrence
Southwestern pond turtle *Clemmys marmorata pallida*	Federal: FSC State: None CDFG: CSC	Slow-moving permanent or intermittent streams, small ponds and lakes, reservoirs, abandoned gravel pits, permanent and ephemeral shallow wetlands, stock ponds, and treatment lagoons. Abundant basking sites and cover necessary, including logs, rocks, submerged vegetation, and undercut banks.	Not expected to occur on site due to the lack of suitable habitat.
Tiger beetle *Cicindela senilis frosti*	Federal: None State: None CDFG: None	Coastal salt marsh	Not expected to occur on site due to the lack of suitable habitat.
Vernal pool fairy shrimp *Branchinecta lynchi*	Federal: FT State: None CDFG: None	Seasonal vernal pools	Not expected to occur on site due to the lack of suitable habitat.
Wandering skipper *Panoqina errans*	Federal: None State: None CDFG: None	Coastal salt marsh; requires moist salt grass for development.	Not expected to occur on site due to the lack of suitable habitat.
Western snowy plover *Charadrius alexandrinus nivosus*	Federal: FT State: None CDFG: CSC	Sandy or gravelly beaches along the coast, estuarine salt ponds, alkali lakes, and at the Salton Sea.	Not expected to occur on site due to the lack of suitable habitat.

Federal
FE-Federally Endangered
FT-Federally Threatened
FSC-Federal Species of Concern

State
SE-State Endangered
ST-State Threatened

CDFG
CSC-California Species of Concern
CFP-California Fully Protected Species

Special-Status Vegetation Communities and Habitats

A review of the CNDDB (November 2004) indicated that the following sensitive vegetation associations are known from the Venice quadrangle: coastal salt marsh, coastal dune scrub. Neither of the above-mentioned sensitive habitats occurs on the Parcel 9U Property.

V. RESULTS

Vegetation Surveys

Vegetation types within the project area were mapped incorporating habitat descriptions provided by Holland (1986). Project-specific vegetation types were modified or created as necessary to reflect on site associations, as discussed in detail below. A summary of the vegetation cover within the project area is presented in Table 3. A map showing vegetation within the project area is attached as Exhibit 3.

TABLE 3. Summary of Vegetation Cover Within Project Area

Vegetation Association	Total (Acres)
Narrow-leaved Willow Scrub	0.22
Ruderal	3.23
Emergent Marsh	0.04
Ruderal Wetland	0.31
Totals	3.80

Narrow-leaved willow scrub. The southern edge of the project site consists of a berm dominated by narrow-leaved willow (*Salix exigua*) with an understory of yellow sweet clover (*Melilotus indica*) and non-native annual grasses.

Ruderal. The majority of the project site, including some portions of the excavated depression and all of the areas outside the depression (except the berm on the southern edge of the property), is dominated by upland non-native herbaceous species including ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), foxtail barley (*Hordeum murinum* ssp. *Leporinum*), bur clover (*Medicago polymorpha*), yellow sweet-clover (*Melilotus indica*), white sweet-clover (*Melilotus alba*), cheeseweed (*Malva parviflora*), white-stemmed filaree (*Erodium moschatum*), small-flowered iceplant (*Mesembryanthemum nodiflorum*), seaside heliotrope (*Heliotropum curassivicum*),and garland chrysanthemum (*Chrysanthemum coronarium*). Also common is the native telegraph weed (*Heterotheca grandiflora*).

Emergent Marsh. A portion of the excavated basin is dominated by hydrophytic herbaceous species including the native alkali bulrush (*Scirpus maritimus*) and toad rush (*Juncus bufonius*).

Ruderal Wetland. A portion of the excavated basin is vegetated with hydrophytic herbaceous species including small locally dominant areas of native species including alkali weed (*Cressa truxillensis*), saltgrass (*Distichlis spicata*), and pickleweed (*Salicornia virginica*). Locally dominant non-native species include five-hook bassia (*Bassia hyssopifolia*), sickle grass (*Parapholis incurva*), and rabbitfoot grass (*Polypogon monospeliensis*).

Special-Status Flora

Focused surveys for four special-status plant species with the potential to occur on site were conducted. These plant species include Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*; CNPS List 1B), estuary seablight (*Sueda esteroa*; CNPS List 1B), prostrate navarretia (*Navarretia prostrata*; Federal Species of Concern, CNPS List 1B), and southern tarplant (*Centromadia parryi* ssp. *australus*; CNPS List 1B). None of these species were detected on site.

Coulter's Goldfields (*Lasthenia glabrata* ssp. *Coulteri)* is a CNPS List 1B species that occurs in salt marsh areas near the coast at the extreme upper end of tidal inundation. It has also been noted on the periphery of vernal pools such as near Miramar Airfield and in alkali marshes and meadows in the inland valleys of western Riverside County. The flowering period is April to June. This species has never been detected at the project site, and is not expected to occur based on lack of detection and marginally suitable habitat.

Mud Nama (*Nama stenocarpum*) is a CNPS List 2 species that occurs near the high tide line of marshes and on the margins of swamps, lakes, and on riverbanks. In southern California, this species occurs in Los Angeles, Orange, Riverside, San Diego, and Imperial counties. The flowering period is January to July. This species has never been detected at the project site, and is not expected to occur based on lack of detection and marginally suitable habitat.

Prostrate Navarretia (*Navarretia prostrata*) is a CNPS List 1B species that in mesic soils in Coastal sage scrub, valley and foothill grassland, and vernal pools. The flowering period is April to July. In southern California, it has been recorded in Los Angeles, Orange, Riverside, San Bernadino, and San Diego counties. This species is recorded in the CNDDB from Manhattan Beach at the junction of Sepulveda Boulevard and West Railroad; however, this occurrence dates from 1944 and is probably extirpated. This species has never been detected at the project site, and is not expected to occur based on lack of detection and marginally suitable habitat.

Southern Tarplant (*Centromadia parryi* var. *australis*) is a CNPS List IB species and is an annual member of the sunflower family that occurs in vernal pools, alkali playas, alkali grasslands, and along the margins of salt marshes. This species is very distinctive, reaching heights of three feet. The flowering period is June to November. This species has never been detected at the project site, and is not expected to occur based on lack of detection and marginally suitable habitat.

No federally or state-listed plant species were detected on site, and none are expected to occur due to the lack of suitable habitat.

Special-Status Wildlife

No special-status wildlife species were observed on site. Based on initial observations, it was determined that the projects site exhibited potential habitat for listed species including California least tern (*Sterna antillarum browni*) and Riverside fairy shrimp (*Streptocephalus wootoni*); however, following more detailed survey work, it was determined that there is very low potential

for California least tern to occur on site and no potential for Riverside fairy shrimp to occur on site.

California Least Tern (*Sterna antillarum browni*) is a federally and state-listed endangered migratory seabird. This species is a small tern, about nine inches long with a 20-inch wingspan. It is mostly white and pale gray, and wingtips are black. The head of the adult has a black cap and white forehead, and the yellow beak is black-tipped. This migratory bird winters somewhere in Latin America, but the winter range and habitats are unknown. The nesting range is along the Pacific coast from southern Baja California to San Francisco Bay. Least terns usually arrive in California in April and depart in August. Suitable habitat for breeding colonies consists of open sandy beaches, dunes, or sparsely vegetated disturbed sites adjacent to bays and lagoons. The project site is suitable breeding habitat, as it consists of a sparsely vegetated site adjacent to a bay. However, this species was not detected by surveys conducted during the breeding period by either GLA (July 18, 2004 and June 16, 2005) or during the course of a fairy shrimp protocol survey conducted by Frank Wegscheider (April 10, 2005). A flyover along the southern site boundary by a single individual was recorded during the June 2, 2006 site visit. The individual was well above the site and did not perch, roost , or otherwise indicate any other potential for using the site.

Riverside Fairy Shrimp (*Streptocephalus wootoni*) is a federally listed endangered branchiopod crustacean. This species has a limited distribution and is known from pool complexes in western Riverside, San Diego, and Orange Counties. It is also known to have occurred historically in the vicinity of Los Angeles International Airport and at one location in Ventura County, based on dry season sampling. The pools in which this species is found are located at elevations of 30-415 meters in seasonal grasslands, some of which are interspersed among chaparral or coastal sage scrub vegetation. These pools tend to be long-lived, have low-to moderate total dissolved solids (less than 600 ppm), and have relatively warm water[9]. Protocol surveys performed by Frank Wegscheider (Permit # TE-038716-0) did not detect Riverside fairy shrimp or any other listed fairy shrimp species. Total dissolved solids (TDS) levels in the excavated depression ranged above 4,000 ppm and on 25 March the depression exhibited a TDS level of 7530 ppm. Conditions are likely unsuitable for the Riverside fairy shrimp as well as for the San Diego and Vernal Pool fairy shrimps in these pools due to excessively high TDS levels. See Appendix C for a complete report of the protocol surveys.

Corps, CDFG, and Regional Board Jurisdiction

Corps jurisdiction at the site totals approximately 0.26 acre [Exhibit 4 – Potential Wetland Areas]. This 0.26-acre area exhibits positive indicators for wetland hydrology, hydric soils and hydrophytic vegetation; however, it is not connected hydrologically to other navigable waters (i.e., Marina del Rey/Pacific Ocean). As discussed in (3.1.b.) above, the Corps could assert jurisdiction over the 0.26-acre area based on adjacency to other navigable waters (i.e., Marina

[9] Eriksen, C and D. Belk. 1999. Fairy Shrimps of California's Puddles, Pools, and Playas. Mad River Press, Eureka, California.

del Rey/Pacific Ocean), and given the proximity of the 0.26-acre area to the marina (approximately 85 feet), it is expected that the Corps will assert jurisdiction over this feature.

The excavated depression does not meet the definition of either a lake or a stream in accordance with the California Fish and Game Code, and would not be subject to regulation by CDFG pursuant to Section 1602 of the California Fish and Game Code.

If the Corps asserts jurisdiction over the 0.26-acre portion of the isolated depression, it will be necessary to obtain a Section 401 Water Quality Certification from the Regional Board as a condition of the Section 404 from the Corps. If the Corps does not assert jurisdiction over this feature, then the Regional Board would assert jurisdiction in accordance with the Porter Cologne Act and require a waste discharge permit (WDR).

California Coastal Commission Jurisdiction

Coastal Commission Jurisdiction on site totals 0.47 acre [Exhibit 4 – Potential Wetland Areas]. Of this, 0.26 acre consists of the previously discussed area that exhibits characteristics consistent with the presence of a three-parameter wetland as defined by the Corps. The additional 0.21-acre area exhibits at least one parameter (positive indicators for hydric soils or hydrophytic vegetation) that would be regulated as wetland by the Coastal Commission.

VI. PROJECT IMPACTS

The impact analysis is based on the assumption that all development on site will avoid the 0.47-acre area subject to Coastal Commission jurisdiction, with the addition of a 25-foot-wide buffer around the Coastal Commission jurisdictional wetland.

VII. IMPACT ANALYSIS

The following discussion examines the potential impacts to plant and wildlife resources that may occur as a result of the development of Parcel 9U. Project-related impacts can occur in two forms, direct and indirect. Direct impacts are considered to be those that involve the loss, modification or disturbance of plant communities, which in turn, directly affect the flora and fauna of those habitats. Direct impacts also include the destruction of individual plants or wildlife, which may also directly affect regional population numbers of a species or result in the physical isolation of populations, thereby reducing genetic diversity and population stability. In general, indirect impacts involve the effects of increases in ambient levels of noise or light, unnatural predators (i.e., domestic cats and other non-native animals), competition with exotic plants and animals, and increased human disturbances such as hiking. Generally, indirect impacts may be associated with the subsequent day-to-day activities of project build-out, such as increased traffic use, permanent concrete barrier walls or chain-link fences, exotic ornamental plantings that provide a local source of seed, etc., which may be both short-term and long-term in their duration. These impacts are commonly referred to as “edge effects” and may result in a slow replacement of native plants by exotics, and changes in the behavioral patterns of wildlife and reduced wildlife diversity and abundance in habitats adjacent to the project site.

Therefore, potential significant adverse effects, either directly or through habitat modifications, on any special-status plant, animal, or habitat that could occur as a result of project development require evaluation under CEQA. It should be noted that project design features such as the use of non-invasive plants, careful light placement, and light shielding could eliminate some adverse effects of development.

California Environmental Quality Act (CEQA) Thresholds of Significance

Environmental impacts relative to biological resources are assessed using impact significance threshold criteria, which reflect the policy statement contained in CEQA, Section 21001(c) of the California Public Resources Code. Accordingly, the State Legislature has established it to be the policy of the State of California:

> *"Prevent the elimination of fish or wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities..."*

Determining whether a project may have a significant effect, or impact, plays a critical role in the CEQA process. According to CEQA, Section 15064.7 (Thresholds of Significance), each public agency is encouraged to develop and adopt (by ordinance, resolution, rule, or regulation) thresholds of significance that the agency uses in the determination of the significance of environmental effects. A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant. In the development of thresholds of significance for impacts to biological resources CEQA provides guidance primarily in Section 15065, Mandatory Findings of Significance, and the CEQA Guidelines, Appendix G, Environmental Checklist Form. Section 15065(a) states that a project may have a significant effect where:

> *"The project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or wildlife community, reduce the number or restrict the range of an endangered, rare, or threatened species, ..."*

Therefore, for the purpose of this analysis, impacts to biological resources are considered potentially significant (before considering offsetting mitigation measures) if one or more of the following criteria discussed below would result from implementation of the proposed project.

Criteria for Determining Significance Pursuant to CEQA

Appendix G of the 1998 State CEQA guidelines indicate that a project may be deemed to have a significant effect on the environment if the project is likely to:

a) *Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.*

b) *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service (including protections provided pursuant to Section 1600 et seq.).*

c) *Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.*

d) *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.*

e) *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.*

f) *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.*

Direct Impacts

The Parcel 9U project site does not support any state- or federally-listed threatened or endangered plant or animal species, nor does it support any special-status plant or animal species. There would be no impacts to state- or federally listed species on the Parcel 9U site. Furthermore, the project site supports only common species, many of which are non-native. All of the species detected onsite are adapted to the urban environment and conversion of portions of the site from ruderal habitat to developed area would not have a significant affect on regional populations of any species detected onsite.

The project site contains wetlands potentially subject to the jurisdiction of the U.S. Army Corps of Engineers and California Coastal Commission. However, the proposed development of Parcel 9U includes both full avoidance of the 0.47 acre of Coastal Commission jurisdictional wetlands

and 0.26 acre of Corps jurisdictional wetlands, and a 25-foot wide buffer on the perimeter of the wetland area.

As a component of the project, the applicant proposes to restore the wetland, including establishment of a "muted" tidal connection and restoration of coastal salt marsh habitat. In order to establish the appropriate elevation that would provide for tidal influence, it will be necessary to re-contour the existing wetland as well as to install the pipe that will provide for the tidal connection. Temporary impacts to the degraded wetland for purposes of restoration would not be considered significant; nevertheless, it will be necessary to obtain authorizations from the Corps and Coastal Commission in order to implement the proposed restoration. Following restoration, the wetland will exhibit higher hydrologic, biogeochemical, and habitat functions.

The Parcel 9U does not support any special-status vegetation communities; therefore, there would be no impacts to special-status vegetation communities.

Indirect Impacts

The Parcel 9U project site does not support any state- or federally-listed threatened or endangered plant or animal species, and no such species have been detected on the site historically subsequent to the construction of the marina. Therefore, no indirect impacts to special-status plant or animal species are associated with the project. As noted in the project description above, the site is generally surrounded by existing development and is clearly "urban". All of the wildlife species observed on the site are well adapted to the urban environment and are not measurably affected by the noise, ambient lighting, and conditions within the urban setting. As such, development of the site would not affect those species that use the site which are fully adapted to the urban setting. No significant affects due to indirect impacts would be associated with the project.

Wetlands subject to the jurisdiction of the Corps and/or the CCC are at a minimum of 25 feet from the areas proposed for development. This wetland area is highly degraded and located in a depression excavated from marine dredge spoils deposited during the construction of the marina, and is dominated by non-native species. There would therefore be no significant indirect impact to wetlands associated with the project.

In the post-project restored condition, it is expected that wildlife usage would be increased, including use by herons and egrets, shorebirds, and waterfowl however, the species most likely to use the site on a regular basis exhibit a high tolerance of the urban environment and no indirect impacts to these species using the restored wetland area would occur in the post-project condition.

VIII. MITIGATION

Development of the Parcel 9U project would not result in significant direct or indirect impacts to biological resources. Therefore, no mitigation is proposed, as none is necessary to reduce impacts to a less than a significant level.

Nevertheless, as addressed above, the applicant has proposed to restore the degraded wetland, which will include establishment of a muted tidal regime that will substantially enhance the hydrologic, biogeochemical and habitat functions of the degraded wetland, and will include the establishment of coastal salt marsh vegetation.

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Adapted from National Geographic TOPO!

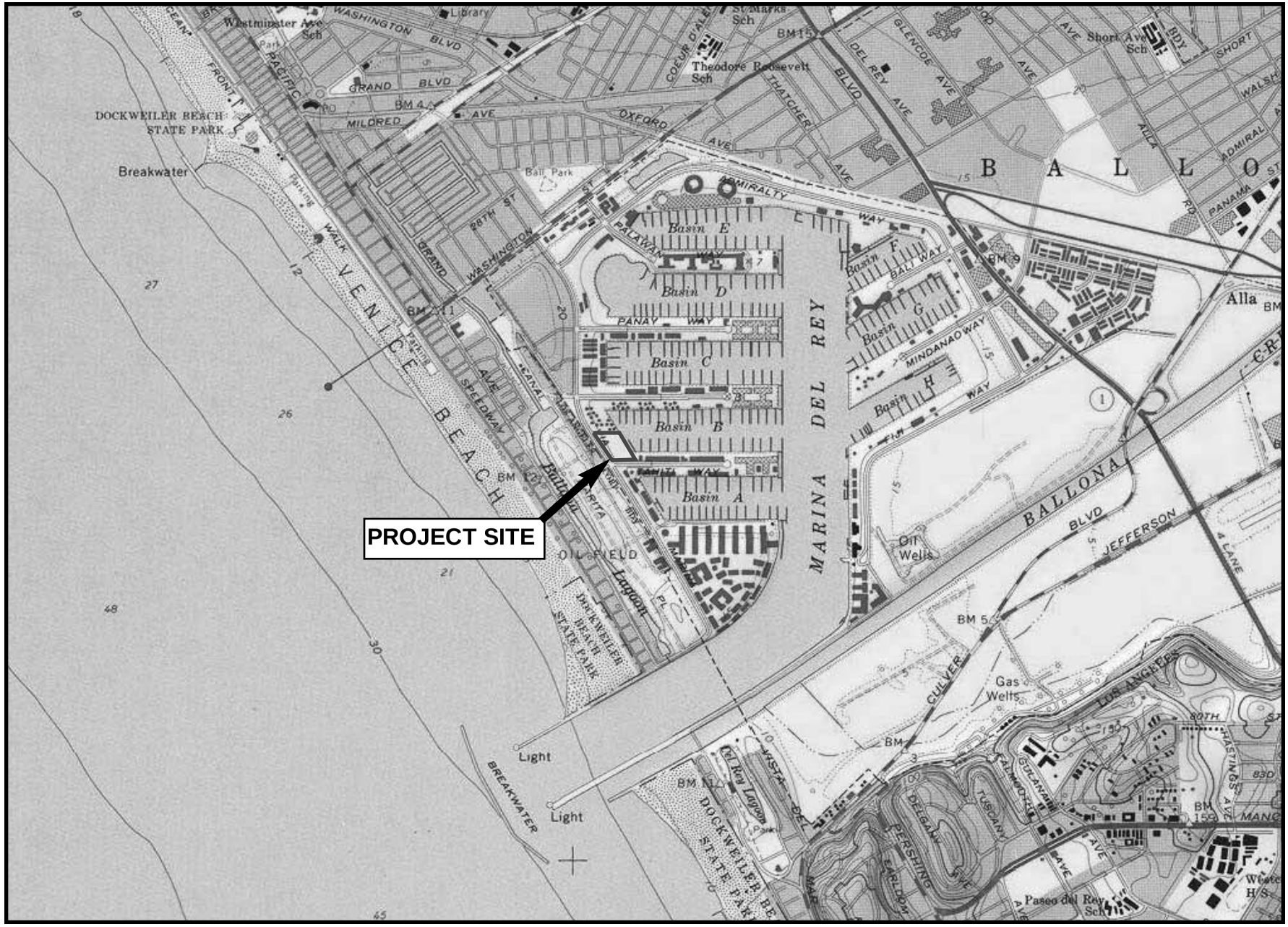
PARCEL 9U

Regional Map

GLENN LUKOS ASSOCIATES

EXHIBIT 1

Adapted from USGS Venice quadrangle



NORTH

0 1000 2000 3000

FEET

PARCEL 9U

Vicinity Map

GLENN LUKOS ASSOCIATES

EXHIBIT 2

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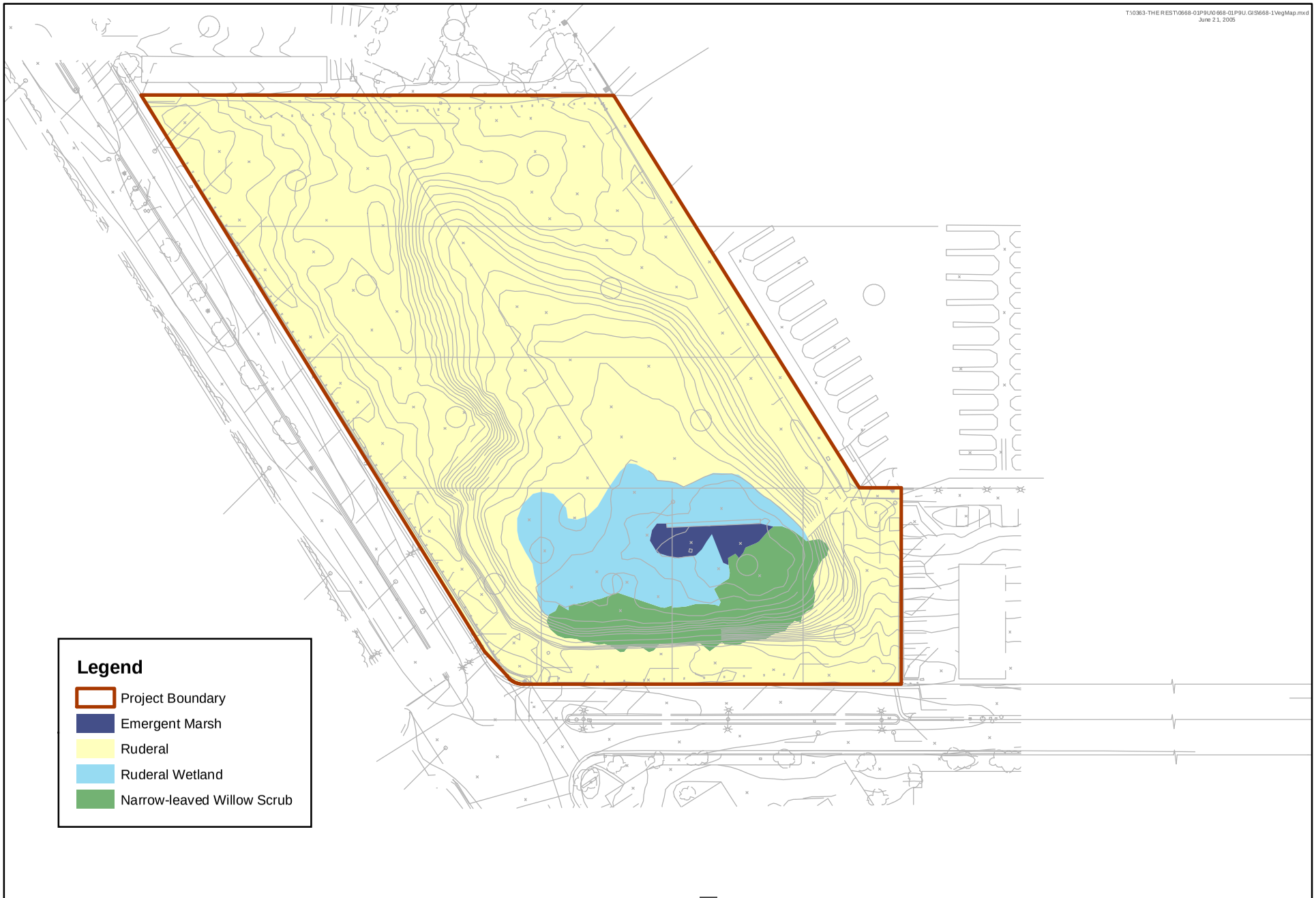
June 21, 2005

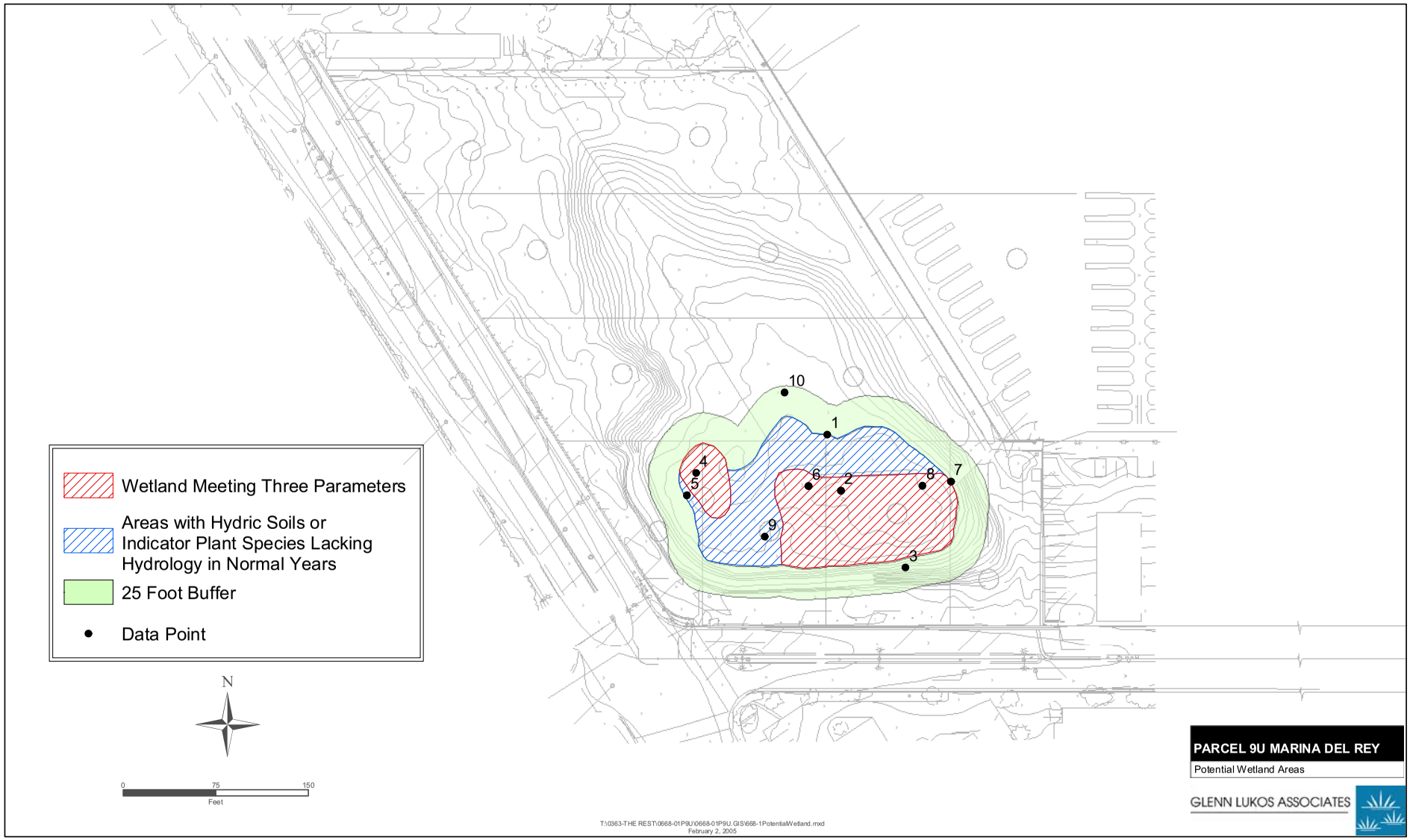


PARCEL 9U MARINA DEL REY

Vegetation Map

GLENN LUKOS ASSOCIATES

Exhibit 3


Wetland Meeting Three Parameters
Areas with Hydric Soils or Indicator Plant Species Lacking Hydrology in Normal Years
25 Foot Buffer
Data Point
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0
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10
1
4
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3
PARCEL 9U MARINA DEL REY
Potential Wetland Areas
GLENN LUKOS ASSOCIATES
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February 2, 2005

APPENDIX A

FLORAL COMPENDIUM

The floral compendium lists species identified on the project site. Taxonomy follows the Jepson Manual (Hickman 1993) and, for sensitive species, the California Native Plant Society's Rare Plant Inventory (Tibor 2001). Common plant names are taken from Munz (1974) and Roberts (1998). An asterisk (*) denotes a non-native species.

SCIENTIFIC NAME	COMMON NAME
ANGIOSPERMS-DICOTS	
AIZOACEAE	**FIG-MARIGOLD FAMILY**
*Carpobrotus edulis**	Hottentot fig
*Msembryanthemum nodiflorum**	Small-flowered iceplant
ASTERACEAE	**SUNFLOWER FAMILY**
*Chrysanthemum coronarium**	Garland daisy
Conyza canadensis	Horseweed
Heterotheca grandiflora	Telegraph weed
Jaumea carnosa	Fleshy jaumea
*Sonchus oleraceus**	Common sow-thistle
BORAGINACEAE	**BORAGE FAMILY**
Heliotropum curassivicum	Seaside heliotrope
BRASSICACEAE	**MUSTARD FAMILY**
*Brassica nigra**	Black mustard
*Raphanus sativus**	Wild radish
CHENOPODIACEAE	**GOOSEFOOT FAMILY**
*Atriplex semibaccata**	Australian saltbush
*Bassia hyssopifolia**	Five-hook bassia
*Salicornia virginica**	Pickleweed
Salsola tragus*	Russian thistle
CONVOLVULACEAE	**MORNING GLORY FAMILY**
Cressa truxillensis	Alkali weed

FABACEAE	**PEA FAMILY**
*Medicago polymorpha**	Bur clover
*Melilotus alba**	White sweet-clover
*Melilotus indica**	Yellow sweet-clover
GERANIACEAE	**GERANIUM FAMILY**
*Erodium moschatum**	White-stemmed filaree
MALVACEAE	**MALLOW FAMILY**
*Malva parviflora**	Cheeseweed
Malvella leprosa	Alkali mallow
SALICACEAE	**WILLOW FAMILY**
Salix exigua	Narrow-leaved willow
ANGIOSPERMS-MONOCOTS	
CYPERACEAE	**SEDGE FAMILY**
Scirpus maritimus	Alkali bulrush
POACEAE	**GRASS FAMILY**
*Avena barbata**	Slender wild oat
*Bromus diandrus**	Ripgut
*Bromus hordeaceus**	Soft chess
Bromus madritensis ssp. *rubens**	Red brome
*Cynodon dactylon**	Bermuda grass
Distichlis spicata	Salt grass
Hordeum murinum ssp. *leporinum**	Foxtail barley
*Parapholis incurva**	Sickle grass
*Polypogon monospeliensis**	Rabbitfoot grass
*Vulpia myuros**	Rattail fescue

APPENDIX B

WILDLIFE COMPENDIUM

The wildlife compendium lists species identified on the project site.
* = non-native species
** = Species not detected, but expected to occur

SCIENTIFIC NAME	COMMON NAME
BIRDS	
ARDEIDAE	**HERONS**
Ardea alba	Great egret
Ardea herodias	Great blue heron
Egretta thula	Snowy egret
Nycticorax nycticorax	Black-crowned night heron
ANATIDAE	**DUCKS, GEESE, SWANS**
Anas platyrhynchos	Mallard
LARIDAE	**GULLS AND TERNS**
Sterna antillarum	Least tern
CORVIDAE	**JAYS AND CROWS**
Corvus brachyrhynchos	American crow
TYRANNIDAE	**TYRANT FLYCATCHERS**
Sayornis nigricans	Black phoebe
Sayornis saya	Say's phoebe
TROCHILIDAE	**HUMMINGBIRDS**
Calypte anna	Anna's hummingbird
ALCEDINIDAE	**KINGFISHERS**
Ceryle alcyon	Belted kingfisher
AEGITHALIDAE	**BUSHTITS**
Psaltriparus minimus	Bushtit
REGULIDAE	**KINGLETS**
Regulus calendula	Ruby-crowned kinglet

MIMIDAE	**THRASHERS**
Mimus polyglottos	Northern mockingbird
STURNIDAE	**STARLINGS**
*Sturnus vulgaris**	European starling
PARULIDAE	**WOOD WARBLERS**
Dendroica coronata	Yellow-rumped warbler
FRINGILLIDAE	**FINCHES**
Carpodacus mexicanus	House finch

22 June 2005

Mr. Daniel Marquez
Recovery Permit Coordinator
U. S. Fish & Wildlife Service – Carlsbad
6010 Hidden Valley Rd.
Carlsbad, CA 92009

Re: 90-Day Letter Report Of Wet-Season Vernal Pool Branchiopod Sampling For The Parcel 9U Property Located In Marina Del Rey, Los Angeles County, California; Conducted Under The Endangered Species Act Section 10(A)(1)(A) Permit # TE-038716-0.

Dear Mr. Marquez:

The following report has been prepared to submit survey information and results of the 2005 wet-season sampling for vernal pool branchiopods at the Parcel 9U property located in the City of Marina Del Rey, Los Angeles County, California.

SUMMARY

Glenn Lukos Associates (GLA) conducted wet-season surveys for federally endangered or threatened branchiopods at the Parcel 9U property, located within the city of Marina Del Rey, Los Angeles County, California (Exhibit 1; Regional Map). Survey sampling was authorized under the federal Endangered Species Act Section 10(a)(1)(A), and was conducted by Frank Wegscheider (permit #TE-038716-0) in accordance with the U.S. Fish and Wildlife Service Vernal Pool Branchiopods Survey Guidelines (1996). No anostracans were found on site during the survey dates.

PROJECT LOCATION AND DESCRIPTION

The 3.8-acre Parcel 9U is located in the City of Marina Del Rey, Los Angeles County, California [USGS 7.5' Venice, California quadrangle map at Township 2S, Range 15W, unsectioned], [Exhibit 1 – Regional Map]. The project is located north of Tahiti Way, west of Basin B of Marina Del Rey, east of Via Marina, and south of a residential development [Exhibit 2 – Vicinity Map]. According to the U.S. Geological Survey (USGS) topographic map of Venice, California [dated 1964 and photorevised in 1981], the Project area supports no blue-line streams. Adjoining properties consist of residential development and Basin B of Marina Del Rey.

The property consists of an empty lot vegetated primarily with upland ruderal species. The south side of the parcel includes an excavated depression that supports a mixture of native and exotic plant species. The southern margin of the basin consists of a berm made up of spoil materials excavated from the basin. The berm supports narrow-leaved willow (*Salix exigua*). The proposed project includes the construction of a hotel on the northern section of the property.

Fig. 1 Regional Map

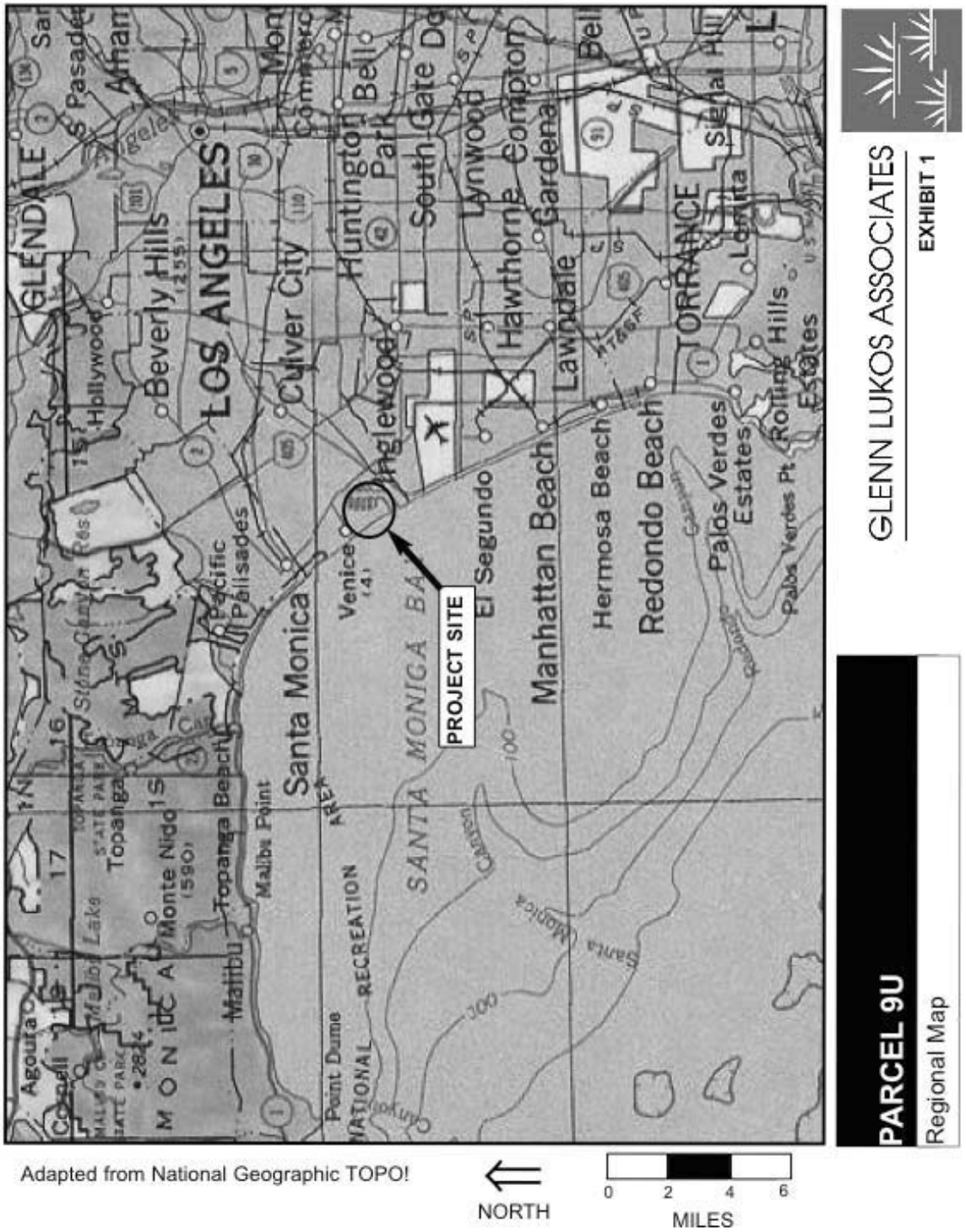
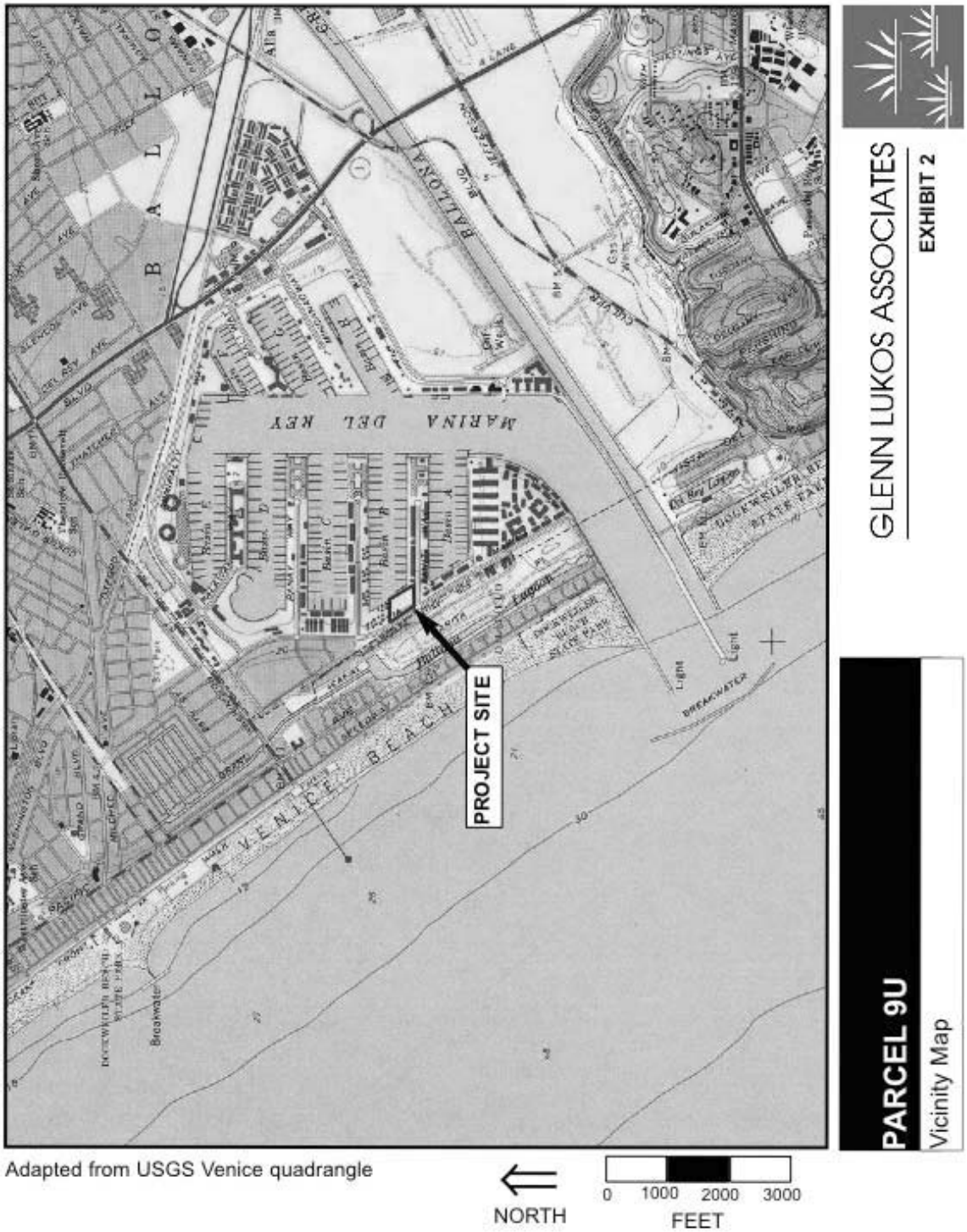


Fig. 2 Vicinity Map



Vegetation

The dominant vegetation on the 3.8-acre Parcel 9U property is primarily ruderal, with dominant species in the upland portions including ripgut (*Bromus diandrus*), rattail fescue (*Vulpia myuros*), telegraph weed (*Heterotheca grandiflora*), slender wild oat (*Avena barbata*), hare barley (*Hordeum murinum* ssp. *leporinum*), soft chess (*Bromus hordeaceus*), garland chrysanthemum (*Chrysanthemum coronarium*), cheeseweed (*Malva parviflora*), white-stemmed filaree (*Erodium moschatum*), bur clover (*Medicago polymorpha*), sow-thistle (*Sonchus oleraceus*), small flower iceplant (*Mesembryanthemum nodiflorum*), Australian saltbush (*Atriplex semibaccata*), alkali heliotrope (*Heliotropum curassivicum*), and giant horseweed (*Conyza canadensis*). Dominant species in the excavated area include alkali weed (*Cressa truxillensis*), five-hook bassia (*Bassia hyssopifolia*), sickle grass (*Parapholis incurva*), red brome (*Bromus madritensis* ssp. *rubens)*, Bermuda grass (*Cynodon dactylon*), and alkali bulrush (*Scirpus maritimus*). The berm is dominated by narrow leaf willow (*Salix exigua*).

Seasonal Pools

GLA identified ponding within the basin on the south side of the project site. During the field visits conducted in October, November and early December 2004, ponding was limited to three small sub-pools in the center of the basin, although rainfall totals were above average during this period. Subsequently, following the extreme storms of late December 2004 and early January 2005, the entire basin became inundated; however the approximately 15 inches of rain in a two week period do not represent "normal" conditions. Depending upon yearly rainfall, the depression may not exhibit inundation in average or below-average rainfall years, or the pools may initially exist as three sub-pools, then become one large pool if rainfall conditions are sufficient, and subsequently trisect into three smaller pools as the depression desiccates.

BRANCHIOPOD SURVEYS

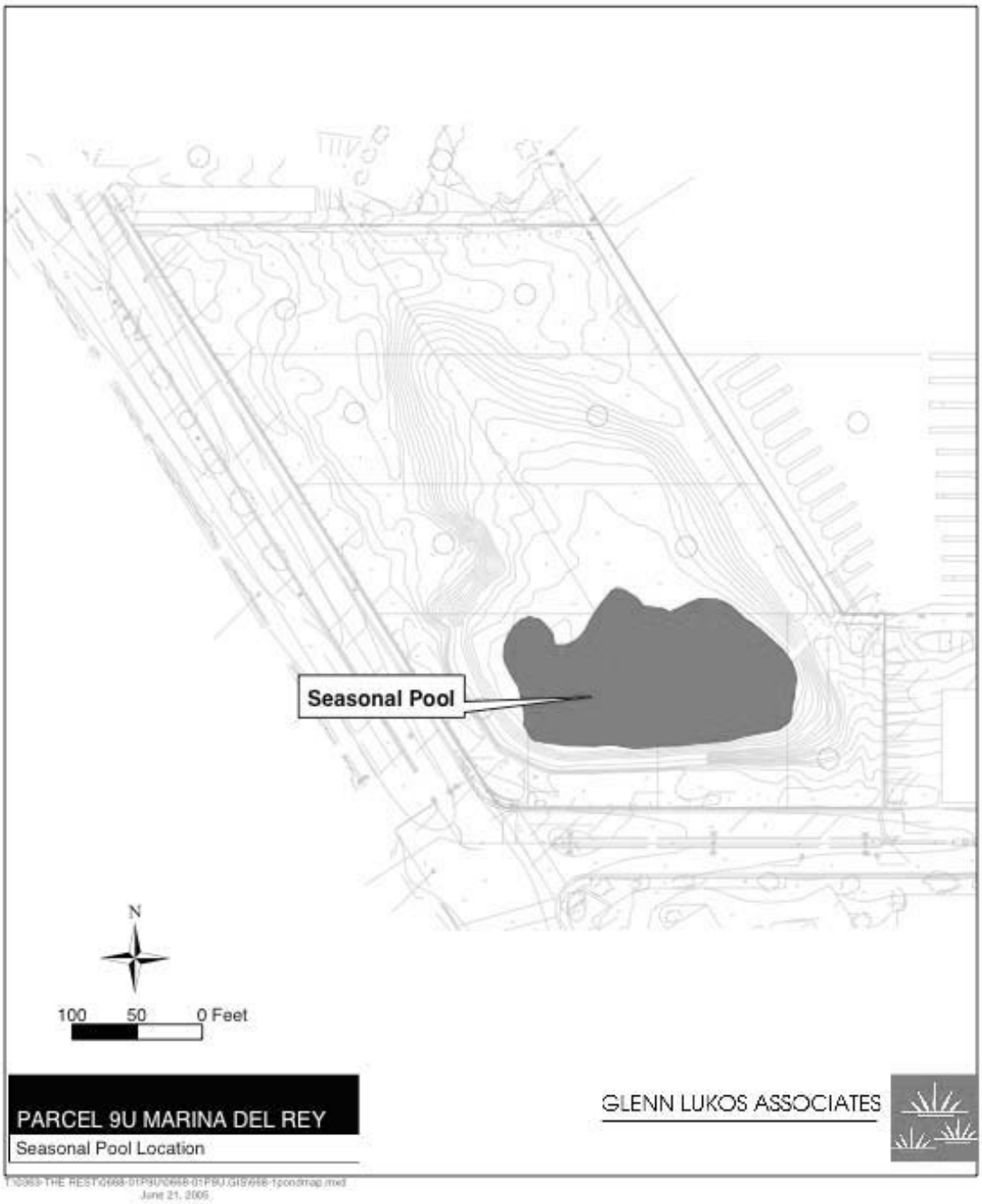
GLA associate biologist Frank Wegscheider (permit #TE-038716-0) conducted protocol fairy shrimp surveys between 13 February and 10 April 2005 during the wet-season study. The selected fairy shrimp sampling site is found on Public Land Survey Sections (California, San Bernardino Base and Meridian) within the following USGS 7.5-minute topographic maps: Venice Quadrangle, dated 1964, photo-revised 1981, (Exhibit 2).

Pools Sampled

One large man-made seasonal pool/depression was originally identified within the basin on the south study area during the initial field visits. However, this pool subsequently trisected into three smaller pools as the depression desiccated. Photographs taken of the sampled pools are shown in the Appendix. The location of the fully-inundated pool is depicted on Exhibit 3 (Pool Location Map); GPS data follows:

Feature 1	Seasonal pool 1	UTM 11	365480E	3760054N
" 2	Seasonal pool 1A	UTM 11	365449E	3760056N
" 3	Seasonal pool 1B	UTM 11	365459E	3760093N

Fig. 3 Pool Location Map



Sampling Timelines

On 1 February 2004, USFWS was notified of intent to perform wet-season surveys for listed branchiopods at the Marina Del Rey property. The first rains of the 2005 season occurred in late October 2004. It is unknown when the depressions first became inundated. Wet-season sampling commenced on 13 February and continued, at 14-day intervals, through 10 April 2005. The site did not experience further inundation after the 10 April 2005 sampling date.

METHODS

Wet Season sampling

Wet season sampling followed the U.S. Fish and Wildlife Service (USFWS) *Interim Survey Guidelines to Permittees for Recovery Permits Under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods* (April1996). Briefly, each pool was photographed (see Appendix) and the exact location was recorded using a Magellan hand-held GPS receiver. At each subsequent visit the air temperature, wind speed and other weather conditions were recorded along with the maximum surface area, depth, and water temperature of each pool. The pools were sampled throughout the water column, including edges & bottom, using a standard 500-micron aquatic dip net (Bioquip®). Additionally, an approximately 210-micron aquarium net was used to sample the water column to detect the presence of newly hatched shrimp and other small branchiopods (e.g., cladocerans & conchostracans).

RESULTS OF 2005 WET-SEASON STUDY

No anostracans were found in any of the depressions during the 2005 wet-season surveys. The summary analysis of the three pools sampled on site is provided in Table 1. Crustacea associated with the pools included a particularly high density of water fleas (Cladocerans) and Seed shrimp (Ostracods). There was a surprising paucity of hexapods residing in the pools; prior to the 25 March survey date, the only insects found residing in the pools were midge (Chironomidae), and other dipteran larvae. On the 25 March survey dates all of the pools harbored, cladocerans, ostracods, mosquito larvae (Culicidae) and other dipteran larvae and dip netting in the main pool also yielded a modicum of water boatman (Corixidae) and backswimmers (Notonectidae).

TABLE 1: MARINA DEL REY PROPERTY
WET-SEASON FAIRY SHRIMP SURVEYS

Survey Dates	Surface Area (m^2)	Depth (cm)	H_20 Temp. (°C)	Dissolved Solids (PPM)	pH	Anostracans	Cladocera	Other Crustacea
MAIN POOL								
02/13/05	978	25	16.2	4260	6.4	0	++	ostracods
02/27/05	N/R	75	22.3	1710	6.0	0	++	ostracods
03/13/05	1702	43	19.9	2350	6.0	0	0	ostracods
03/25/05	750	30	25.4	3040	6.4	0	++	ostracods
04/10/05	DRY	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Survey Dates	Surface Area (m^2)	Depth (cm)	H_20 Temp. (°C)	Dissolved Solids (PPM)	pH	Anostracans	Cladocera	Other Crustacea
POOL A								
02/13/05	91	10	N/R	N/R	N/R	0	++	ostracods
02/27/05	DRY	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/13/05	DRY	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/25/05	80	14	29.4	7530	6.6	0	++	ostracods
04/10/05	DRY	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Survey Dates	Surface Area (m^2)	Depth (cm)	H_20 Temp. (°C)	Dissolved Solids (PPM)	pH	Anostracans	Cladocera	Other Crustacea
POOL B								
02/13/05	23	6	N/R	N/R	N/R	0	0	0
02/27/05	DRY	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/13/05	DRY	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/25/05	280	15	29.4	3830	6.4	0	++	ostracods
04/10/05	DRY	N/A	N/A	N/A	N/A	N/A	N/A	N/A

DISCUSSION

Seasonal/Vernal Pools

Vernal pools are characterized as shallow, ephemeral wetlands with very specific hydrologic characteristics and possess a unique vegetative community (Zedler, 1987). As such, they also support specific types of wildlife including fairy shrimp.

The basin on the south side of the Parcel 9U project site was excavated in 1984 for a development project, but was halted well before completion. The I-beam pilings installed as part of the construction operation still ring the site and a concrete foundational structure, which was installed within the excavated basin, is still intact. The excavated depression is clearly not a natural feature, and therefore the pools within the man-made basin are termed “seasonal pools.”

Fairy Shrimp Species of Concern

Only two species of anostracans listed for protection under the Federal Endangered Species Act have the potential to occur at this site; the Riverside fairy shrimp *Streptocephalus woottoni* and the vernal pool fairy shrimp The versatile fairy shrimp *Branchinecta lindahli*, which may range throughout this area, is not a concern since it is a widespread and common, non-listed species.

Streptocephalus woottoni is a fairy shrimp that lives in warm-water, long-lived pools with low to moderate total dissolved solids (TDS) generally with a depth greater than 30 cm (Eriksen and Belk 1999). Riverside fairy shrimp cysts have been found in soils adjacent to the Los Angeles

International Airport (T. Bomkamp, pers. comm.), although it is unknown whether the cysts were viable.
TDS levels in pool 1 ranged above 4,000 ppm and on 25 March pool 1a had a TDS level of 7530 ppm. Conditions are likely unsuitable for *S. woottoni* in these pools due to excessively high TDS levels. None of the surveyed depressions/drainages contained fairy shrimp within the genus *Streptocephalus*.

Branchinecta lynchi lives in cool-water, short-lived pools, again with low to moderate TDS that may exist for only three weeks in the spring (Eriksen and Belk 1999). The vernal pool fairy shrimp generally hatches early in the season when water temperatures are below 10° C (Gallagher, 1996; Helm, 1998). The vernal pool fairy shrimp may cohabit with the versatile fairy shrimp, but is found in very low densities typically comprising perhaps only one to five percent of the total population in the pool. The nearest pool that harbors vernal pool fairy shrimp is within the Cruzan (Mystery) Mesa vernal pool complex north of Santa Clarita ca., 60 miles distant from the Marina Del Rey site. However, no branchinectids were found in the Marina Del Rey pools.

If you have any questions regarding this report please contact me via phone at (714) 993-9249 or email at fwegscheider@fullerton.edu.

I certify that the information in this survey report and attached exhibits fully and accurately represents my work.

	15 April 2005	TE-038716-0
Frank J. Wegscheider	Date	Permit No.

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Supplemental Marine Biological Impact Assessment

SUPPLEMENTAL MARINE BIOLOGICAL IMPACT ASSESSMENT

LEGACY PARTNERS
NEPTUNE MARINA DEVELOPMENT PROJECT
MARINA DEL REY HARBOR
MARINA DEL REY, CALIFORNIA

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MARINE BIOLOGICAL IMPACT ASSESSMENT
LEGACY PARTNERS NEPTUNE MARINA DEVELOPMENT PROJECT
BASIN B AND C, MARINA DEL REY HARBOR, CALIFORNIA

1.0 INTRODUCTION

Coastal Resources Management, Inc. (CRM) has been engaged by Legacy Partners Residential, Inc. (Legacy Partners) to prepare this Marine Biological Impact Assessment report, as required by the Marina del Rey Local Coastal Program, in conjunction with Legacy Partners' planned redevelopment of the land-and-waterside portions of Marina del Rey Parcel 10R and its planned construction of a public/"transient" anchorage abutting the Parcel 9U bulkhead. As outlined in greater detail in section 1.1.1 of this report, Legacy Partners' development proposal for Parcel 10R and the waters abutting the Parcel 9U bulkhead are components of a larger apartment, anchorage, hotel/timeshare resort and public park development being proposed by Legacy Partners and Woodfin Suite Hotels, LLC (Woodfin) on Parcels 9U, 10R and FF in the County unincorporated community of Marina del Rey.

This report focuses on the requirements set forth in the Marina del Rey Specific Plan, Part 3 of Chapter 22.46, Supplemental Filing Requirements for development projects in Marina del Rey (Revised Feb 96). Specifically, this report addresses filing requirement 22.46.1180.2, regarding the proposed development's impacts on the biological productivity of the marine resources within and adjacent to Marina del Rey, including:

- Effects of any additional pollutants due to increased runoff caused by new development;
- Potential changes in water temperature and biological productivity caused by outfalls, runoff, or a decrease in light entering the water due to shadowing (new buildings); and
- Effects of any new structures placed in the water.

1.1 PROJECT DESCRIPTION

The proposed projects elements are located on or seaward of County Parcels 10R and FF (residential units and private marina on the north side of Basin B) and County Parcel 9U located at the west end of Basin B of Marina del Rey Harbor in Los Angeles, County California (Figure 1, Figure 2a and 2b).

Parcel 10R is a rotated L-shaped site that wraps partially around "Basin B" of the Marina del Rey small-craft harbor. The parcel consists of a total of 7.32 landside

Figure 1. Marina del Rey Harbor
(Source: County of Los Angeles Department of Harbors and Beaches)

Figure 2a. View of Project Site, Basin B Facing North

Figure 2b. View of Project Site, Basin B Facing Southeast

acres and 4.68 waterside or submerged acres. The perimeter of the site is bordered to the west by Via Marina and to the north by Marquesas Way. Marina del Rey Parcel 9U forms the southern boundary of the landside portion of the site, while Marina del Rey Parcel 12R forms the easternmost boundary on the landside portion of the parcel. The site perimeter extends into the waters of Basin B to the south and east.

Parcel 9U consists of 3.66 landside acres and is bound by Marina del Rey Parcel 10R to the north, Via Marina to the west, Basin B of Marina del Rey to the east and Tahiti Way to the south.

Parcel FF is a rectangular site that lies on the southwest corner of "Basin C" of the Marina del Rey small-craft harbor. The parcel consists of a total of 2.05 landside acres and borders the waterfront along approximately 200 linear feet of the site. The perimeter of the site is bordered to the west by Via Marina and to the south by Marquesas Way. Its easternmost boundary is formed by Marina del Rey Parcel 13R. Marina del Rey Parcel 15U and the waters of Basin C comprise the northern boundary of the site.

A joint site plan for the proposed Legacy Partners and Woodfin projects on Parcels 9U, 10R and FF is depicted in Figure 3. A site plan showing Legacy Partners' proposed private marina at Parcel 10R and its proposed public/"transient" anchorage abutting the Parcel 9U bulkhead is provided in Figure 4.

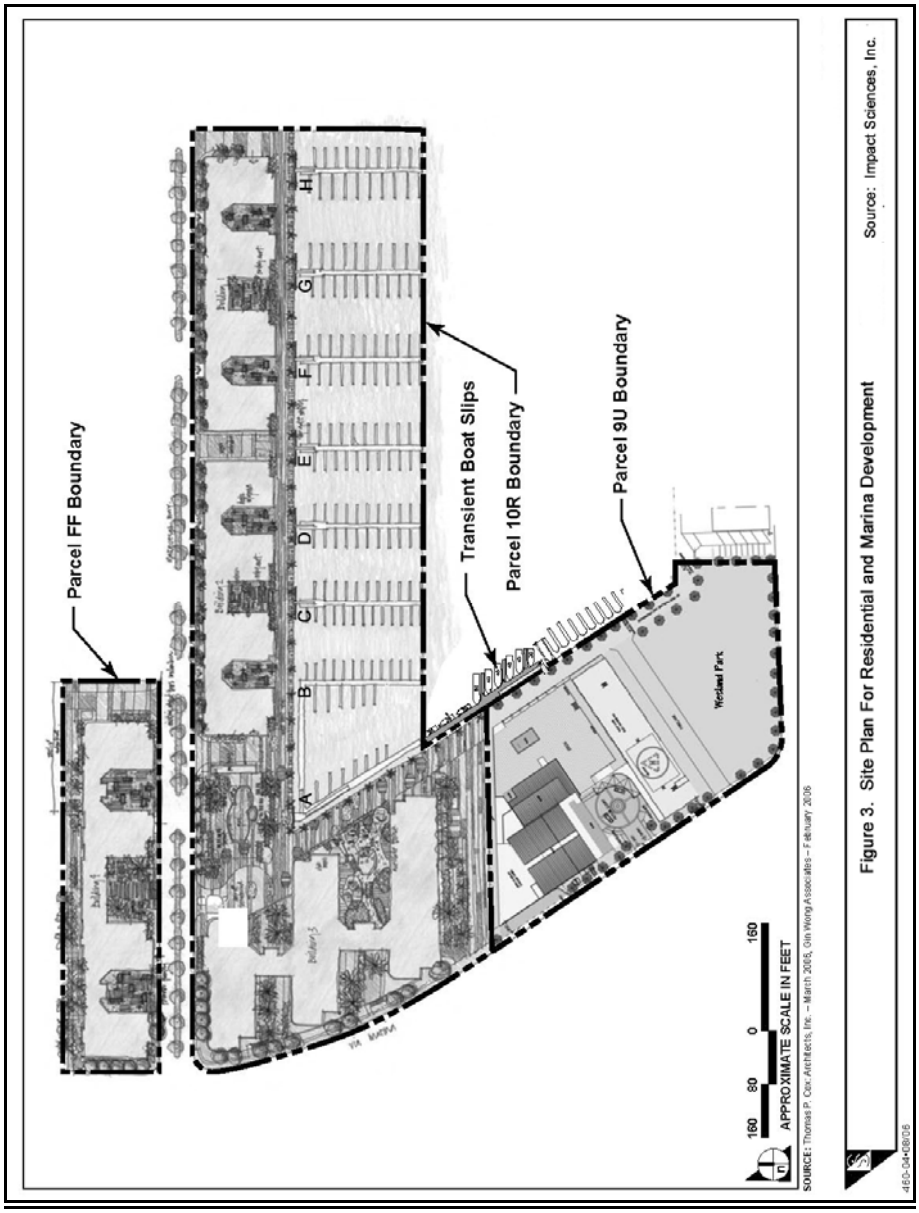


Figure 3. Site Plan for Residential and Private Marina Development
Note: Marina slip design is detailed in Figure 4)

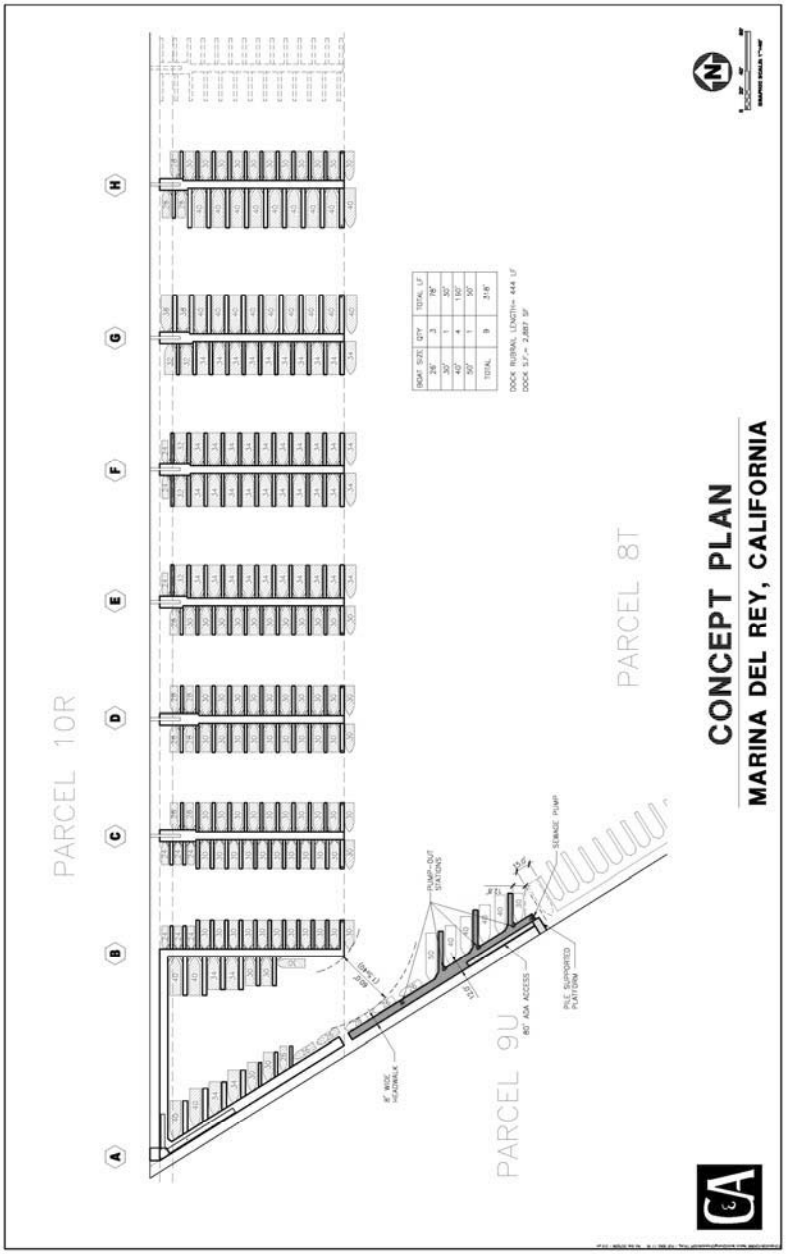


Figure 4. Concept Plan for Private Marina, Public Dock, and Vessel Pump-out Facilities (Source: Cash & Associates Engineers)

1.1.1 Detailed Private Marina and Residential Project Development Description

Legacy Partners has made application to the County of Los Angeles for approval of a Coastal Development Permit to authorize the demolition of all site improvements on County Parcel 10R, which include 136 existing apartment units and appurtenant parking, landscape and hardscape facilities. Post-demolition, Legacy Partners proposes to construct an apartment complex on Parcel 10R containing 400 rental dwelling units in three (3) apartment buildings (4 residential floors over 2 levels of at-grade and partially subterranean structured parking) with private courtyard and outdoor recreation (pool) areas, a 28-ft.-wide public Waterfront Stroll Promenade along the entire waterfront extent of the parcel, and appurtenant common landscaped and hardscaped facilities.

Legacy Partners has also made application to the County for "Coastal Approval in Concept" reviews pertaining to its planned demolition of the existing "Neptune Marina" anchorage and the subsequent construction a new private marina on the waterside portion of Parcel 10R; and for its development of a public/"transient" anchorage abutting the Parcel 9U bulkhead. The planned waterside development on both Parcel 10R and abutting Parcel 9U will be within marina "Basin B". The existing marina to be demolished at Parcel 10R under Legacy Partners' waterside development proposal contains 184 boat slips and 14 end-tie spaces. Legacy Partners' proposed new private marina on the waterside portion of Parcel 10R will contain 161 boat slips and 13 end-tie spaces, with contemporary, appurtenant landside (boaters' restrooms, lounge and parking) and waterside (dock-side utilities and a bilge/sewage pump-out station) facilities. Legacy Partners' proposed new public anchorage to abut the Parcel 9U bulkhead will contain approximately 542 lineal feet of public/transient vessel docking space and would provide berthing for between seven and 11 transient vessels (depending on the boats' size) as well as a dingy berthing area at the northerly end of the anchorage (see Figure 4 for detail).

Under a separate Coastal Development Permit request filed with the County, Legacy Partners is proposing to demolish an existing surface parking lot on Parcel FF and to subsequently construct one apartment building containing 126 rental dwelling units (4 residential floors over 2 levels of at-grade and partially subterranean structured parking) with private courtyard areas; a 28 ft.-wide public Waterfront Stroll Promenade along the entire waterfront extent of the parcel; and appurtenant common landscaped and hardscaped facilities.

Woodfin has filed a separate Coastal Development Permit with the County to authorize, on the northerly portion of Parcel 9U, the construction of a 19-story, 288-room hotel and vacation ownership resort structure (up to 152 conventional hotel suites and 136 vacation ownership/"timeshare" suites) containing an assortment of accessory uses typical of the resort environment (i.e., cocktail lounge, restaurant, pool, spa). The project includes a six-level parking garage

adjoining the hotel/vacation ownership structure to the north (5 parking levels above ground and 1 parking level underground). The Project also includes construction of a 28-foot-wide public pedestrian promenade along the parcel's entire water frontage.

Concurrently with the above described development, Legacy Partners and Woodfin will partner in jointly funding the development of an approximately 1.46-acre public wetland park on the southerly portion of Parcel 9U.

1.2 FOCUS OF SUPPLEMENTARY DOCUMENT

CRM previously assessed the impacts of the Neptune Marina development project on marine resources in Basins B and C (Coastal Resources Management 1999) relative to a similar prior development proposal by Legacy Partners and Woodfin on the subject Parcels 10R, FF and 9U. That report is included in this document along with updated marine resources environmental information for Marina del Rey Harbor (ABC Laboratories 2001), and the results of site-specific marine resources surveys conducted in Basin B by CRM in October 2006.

An additional resources impact assessment has been added to this study specific to the effects of the proposed Woodfin hotel/timeshare resort development on Parcel 9U, and vessel pump-out facilities and boat dock adjacent to the Parcel 9U bulkhead on marine resources.

2.0 ENVIRONMENTAL SETTING

2.1 PROJECT LOCATION

Marina del Rey Harbor is located in Santa Monica Bay, California, south of Venice and north of Playa del Rey (Figure 1). It is approximately 24 kilometers (14.9 miles) southwest of downtown Los Angeles. Constructed in 1960 from part of the Ballona Wetlands and the former Lake Los Angeles, Marina del Rey Harbor encompasses approximately 354 acres and has a capacity to accommodate more than 6,000 private watercraft (Figure 1). The marina is protected at its entrance by two jetties and a detached breakwall, and is adjacent to the downcoast Ballona Creek Flood Control Channel. Marina del Rey Harbor is divided into eight basins, A through H.

The Ballona Creek watershed drains about 329 square kilometers of watershed in Los Angeles County. The watershed boundary includes the Santa Monica Mountains on the north and the cities of Baldwin Hills and Inglewood on the south. The western boundary is approximately 1.6 kilometers (1 mile) inland from the Pacific Ocean and extends from the Santa Monica Mountains southward to Venice and eastward to Baldwin Hills. The eastern boundary extends from the crest of the Santa Monica Mountains southward and westwards to the vicinity of central Los Angeles. Tributaries of Ballona Creek include Centinela Creek, Sepulveda Canyon Channel, Benedict Canyon Channel, and numerous storm drains.

Runoff and associated contaminants from the watershed are discharged into the marina's south entrance channel and Santa Monica Bay at the mouth of Ballona Creek, which is located immediately downcoast of Marina del Rey Harbor. Several storm drains lead into the back basins including the Washington Street Drain and the Oxford Drain. Other sources of contaminants include the illegal flushing of bilges and boat repairs (scraping of fouling organisms and antifouling paint from watercraft hulls), and accidental sewage discharges from the City of Los Angeles wastewater treatment system.

Much of the habitat in Marina del Rey Harbor is subtidal (below the tide level) soft bottom habitat consisting of sands, silts, and clays. The breakwall and main channel entrance jetties are constructed of rip rap and support hard bottom species (ACOE 1999). With the exception of these rip rap areas, hard bottom in the marina is limited to vertical retaining walls, piers, and floats. The only gently sloping, shallow water habitat in the marina is a small swimming beach (Mother's Beach) at the back of Basin D (Figure 1).

The following section discusses the results of a literature search and review of data on the marine environmental conditions within Marina del Rey Harbor. The focus of the search was primarily on Basin B where the Neptune Marina Project is proposed and the back basins where storm drain runoff enters the harbor. Conditions throughout the marina are also described for comparative purposes.

2.2 ENVIRONMENTAL REVIEW OF EXISTING DATA

Environmental studies have been conducted since at 14 sampling stations within Marina del Rey Harbor since the 1970s (Figure 3). Sponsored by the Los Angeles County Department of Beaches and Harbors, these studies were first conducted by the University of Southern California Harbors Project between 1976 and 1996. These studies were designed to document changes in the chemical, physical, and biological environment within the marina and associated drainages. The program was transferred to Aquatic Bioassay and Consulting Laboratories (ABC Laboratories) who has been conducting the environmental studies since 1996. Sampling has been conducted to monitor water and sediment quality, benthic infauna, and ichthyofauna within the marina and Ballona Creek.

The review focuses primarily on the Los Angeles County program sampling methodologies and results of the 1976 to 2001 studies, but also includes other relevant data from within the marina. Updated information is provided in the report from the results of marine resources surveys conducted by CRM in 2006 (CRM 2006a,b,c,d and CRM 2007).

Figure 5 shows the location of the County's sampling stations; most (14 of 18) of the water, sediment, and infauna stations are located within the marina. Two of the non-marina stations are located within or near Ballona Creek; the other two are within the Oxford Drain. Three of the marina stations (numbers 5, 6, and 8) are near the proposed Neptune Marina Project Site. Station 5 is in the center of the main channel (water depth is 12-15 ft); Station 6 is at the innermost end of Basin B (water depth is 10-12 ft); and Station 8 is off the swimming beach in Basin D (water depth 10-12 ft). No marine environmental data are known from within Basin C.

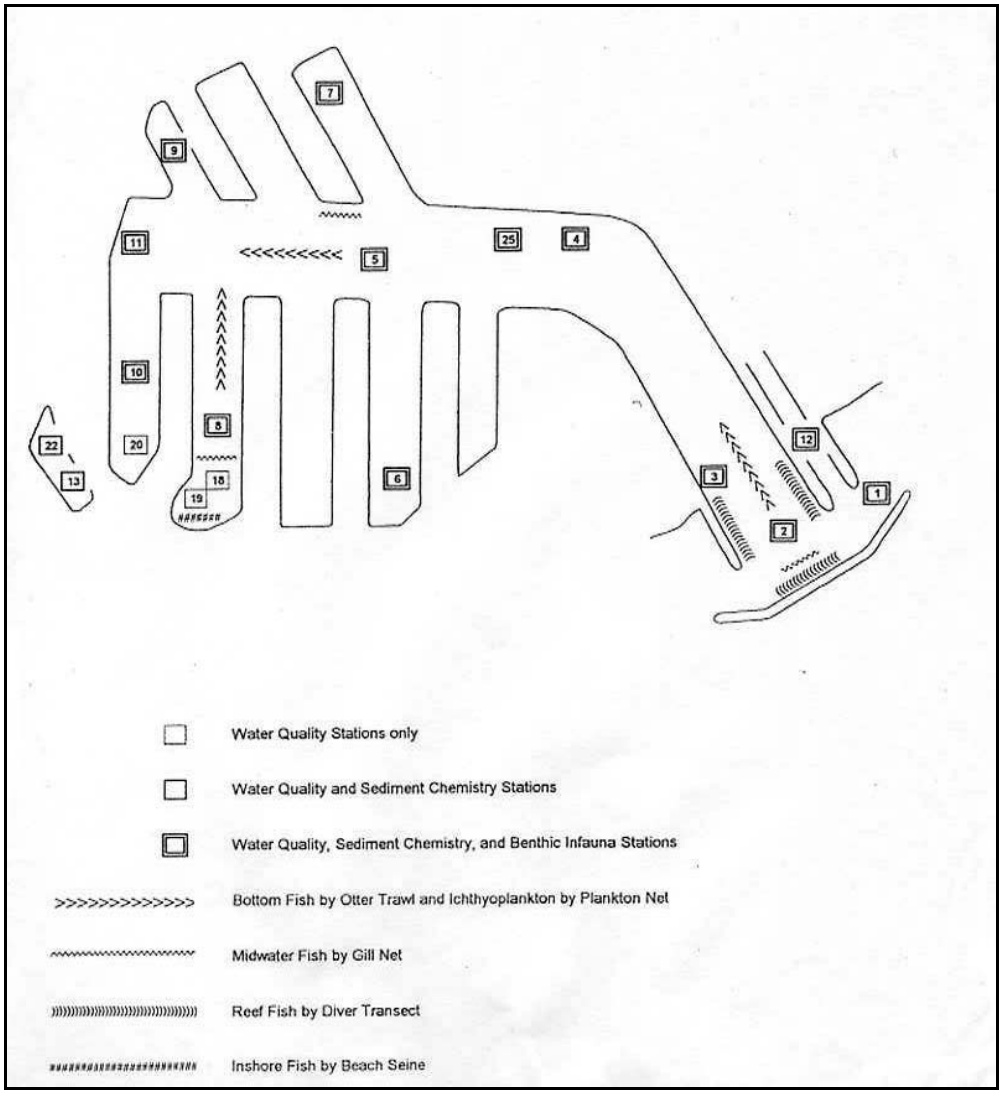


Figure 5. L.A. County Marina del Rey Harbor Sampling Locations
(Source: ABC Laboratories 2001)

2.2.1 Water Quality

The County program included monthly surveys, comprising temperature, salinity, dissolved oxygen, pH, and light transmittance profiles, Secchi disc readings, and depth-stratified water samples are taken at 18 stations. Recently, coliform and Enterococcus analyses have also been performed at several stations. Collected water samples are returned to the laboratory for biological oxygen demand (BOD), ammonia, dissolved oxygen, and pH analyses.

Water quality in Marina del Rey Harbor is influenced by both dry and wet season runoff from the watershed and in general, exhibits high seasonal variations in temperature, salinity, dissolved oxygen, and turbidity (Soule et al. 1993, ABC Laboratories 1997, 2001). This is partially a result of poor flushing and mixing with offshore waters (ACOE 1999). Water quality tends to be better in the main channels near the ocean entrance, and declines with distance into the back basins. In general, Basin B can be grouped together with Basin H and the lower main channel areas. Water tends to be more saline, clear, and high in pH and dissolved oxygen. Organics are low and other measurements are moderate. Basin B and other sites within this grouping are within some of the healthiest areas of the marina.

Water Temperature. From 1976 through 1996, the surface water temperature in Marina del Ray varied between 11.0^{o} C to 28.2^{o} C. During The 1996-1997 sampling program recorded a temperature range of 12.4 to 24.6^{o} C; the annual average temperature was 19.0 ^{o} C within the Basin B marina (Station 6). Comparatively, the average water temperature for that same period was 19.0 ^{o} C (Stations 5, main channel) and 19.2 ^{o} C (Station 8, Basin D) (ABC Laboratories, 1997). During 2000-2001, the mean surface water temperature was 18.2 ^{o} C, compared to a range in the harbor between 8 ^{o} C to 24.2 ^{o} C (ABC Laboratories, 2001).

Dissolved Oxygen. Dissolved oxygen in seawater ranges from about 0 to 16 parts per million (milligrams per liter). Typical Santa Monica Bay oxygen levels range from 6.0 to 8.5 mg/l (EPA 1986). A value of 5.0 is recognized as a standard acceptable level to sustain marine life, although benthic invertebrates (crabs, snails, clams, and worms) can sustain slightly lower levels of dissolved oxygen, around 2.0 mg/l (EPA 1986).

In Marina del Rey Harbor, dissolved oxygen declines with distance from the entrance channel (Soule et al. 1993), reflecting a build of organics in the back channel basins, storm drain runoff areas, and reduce tidal flushing activity. Dissolved oxygen concentrations within the marina ranged between 1.0 to 13.8 parts per million [ppm]) from continuous sampling between 1988 through 1996 (Soule et al 1997). Average dissolved oxygen values for Stations 5 (main channel), 6 (Basin B), and 8 (Basin D) during the 1996-1997 samplings ranged from 6.8 to 7.2 ppm. In 2000-2001, the range at these stations varied between 6.3 and 7.6 ppm and values for the harbor during the 2000-2001 season were within the overall range for the preceding ten years.

Values during all seasons tended to have a greater range in values. Lowest oxygen levels typically occur during the warmest time of the year and some individual values will decrease to below 5.0 mg/l. In August, 1996, a concentration of 2.2 mg/l was recorded in the Oxford Lagoon. Lowest values in the 2000-2001 season were also in the Oxford Lagoon (1.0 mg/l, August 2000).

Water Salinity. Water salinity (the amount of dissolved salts per unit volume of seawater) is relatively constant in Santa Monica Bay whereas it varies over a wide range in Marina del Rey Harbor (MBC 1994). In Santa Monica Bay, the mean salinity over a 5-year period was 33.75 parts per thousand (ppt), with a 90% range between 33.57 and 33.92 (U.S. Navy 1986). Variations in the Bay occur primarily due to freshwater (storm) input and upwelling.

Salinity in Marina del Rey Harbor is much more variable, because of the amount of storm water runoff which enters the system, principally from Ballona Creek and Oxford Street Basin. Salinity is generally well mixed from the surface to bottom, except during storm events when the less saline, freshwater forms a lens above the denser and more saline bottom waters.

Since 1983, salinity has varied from 0.0 to 34.8 ppt (ABC Laboratories, 1997, 2001). Salinity values for all marina stations ranged from 0.1 to 34.9 parts per thousand (ppt) from 1991 through 1996; a range of 21.1 to 34.1 ppt was recorded for the 1996-1997 sampling period and a range of 16.6 to 33.9 were observed during the 2000-2001 season. Mean salinity values for stations 5, 6 (Basin B) and 8 were 33.3, 33.3, and 33.2, respectively during 1996-1997; In the 2000-2001 sampling period, the average mean salinity in Basin B was 33.1, with a range between 16.3 and 33.9 ppt (ABC Laboratories, 2001).

Surface Transparency. Water clarity is important because both benthic (bottom-dwelling algae and seagrasses) and phytoplankton (floating microscopic plants) are dependent upon their ability to capture light during the photosynthetic process. Surface transparency is recorded as the depth at which a weighted white plastic disk disappears from view and is used as a simple estimate of the amount of ambient submarine light available during the photosynthetic process. Transparency is affected by seasonal runoff during the winter and occasional plankton blooms, both of which decrease surface transparency.

During 1996, surface transparency varied from less than 1 meter to 6 meters. Spatially, water clarity values were highest within the channels (3.4 to 3.7 meters) and near the entrance (3.7 to 3.8 meters), and lowest in Basin E (1.9 meters). Basin B, located relatively near the entrance channel, exhibited moderately high water clarity (3.2 meters). During the 2000-2001 sampling season, average seasonal transparency values varied between 2.0 and 3.6 meters (Basin D and the Main Channel, respectively) and water clarity in Basin B was 2.5 meters, a slight decrease compared to 1996-1997. This trend was generally observed for all stations during this sampling period. Overall, water clarity tends to decrease with distance into the channels and basins due to poor flushing and a higher concentration of particulate material in the water column.

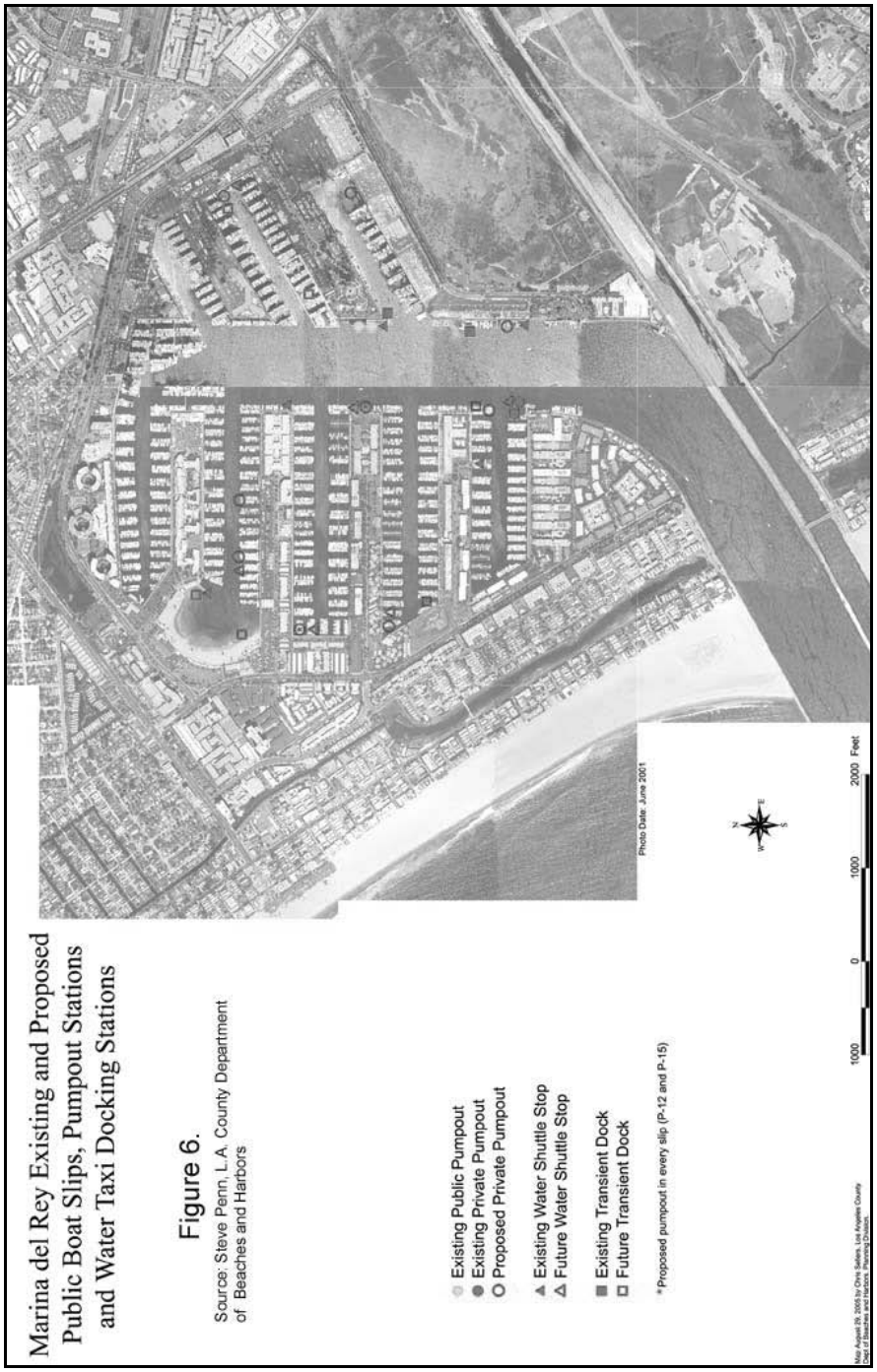
Bacterial Water Quality. Water contact in marinas is a concern because of the high frequency of water contact activity through sailing, boating, swimming (Basin D), and other water contact activities. Fecal contamination may enter Marina del Rey Harbor through several sources, including illegal dumping or leakage of human sewage from vessels, tidal flushing, or rainfall runoff of fecal material from animal and/or humans from jetties, beaches, and docks; hosing off vessels used as bird roosts and sea lion haul-outs, and runoff from storm drain channels. Rainfall events periodically trigger overflows in storm drains that enter Marina del Rey Harbor. There are currently three public vessel pump-out stations and one private pump-out station in Marina del Rey Harbor with another eight pump-out stations proposed (Figure 6). Based on historical data, recreational vessels in the marina do not appear to be a continuing source of coliform bacteria contamination, since there are few dry weather violations (ABC Laboratories 2001).

Total coliform values averaged over the 2000-2001 sampling period varied between 6,061 mpn/100 ml (Oxford Channel) to 98 (Main Channel). Basin B total coliform levels averaged 237 mpn/100 ml. Highest values tended to occur in Oxford Channel, Ballona Creek, and Basin E. Highest values were observed during the winter rainfall periods. The frequency of total coliform violations (>10,000 mpn/100 ml) during the 2000-2001 sampling period ranged between 1 during summer and 20 during winter.

Fecal Coliforms. Fecal coliforms ranged between >20 to >16,000 mpn/ ml in 2000-2001. Counts were in violation 22 times. Nearly all of the violations were in Basin D during March 2001, following heavy rainfall. Fecal coliforms are highest in Ballona Creek, Oxford Lagoon, and Basin E (ABC Laboratories, 2001). Basin B geometric mean values during the 2000-2001 sampling period were low (26 mpn/ 100 ml).

2.2.2 Sediment Quality

The sediment sampling program comprises annual sampling with a modified 0.1 m^2 Van Veen grab sampler or similar device. Sub-samples for grain size and chemical analyses are taken prior to sieving the remaining portion through nested 1.0 and 0.5 mm screens. The retained portion of each sample was used for infaunal taxonomy and enumeration. Physical analyses include particle size distribution and median grain size, percent moisture, volatile solids, and total dissolved solids. Laboratory analyses include total organic carbon, and immediate and chemical oxygen demand, 31 metallic and nonmetallic contaminants, and 20 pesticides and chlorinated hydrocarbons. Infaunal abundance (number of individuals) by species is completed for the single sample taken at each station and is presented as number per unit area.


Marina del Rey Existing and Proposed Public Boat Slips, Pumpout Stations and Water Taxi Docking Stations
Figure 6.
Source: Steve Penn, L.A. County Department of Beaches and Harbors
Existing Public Pumpout
Existing Private Pumpout
Proposed Private Pumpout
Existing Water Shuttle Stop
Future Water Shuttle Stop
Existing Transient Dock
Future Transient Dock
* Proposed pumpout in every slip (P-12 and P-15)
Photo Date: June 2001
1000 0 1000 2000 Feet
N
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Sediment Grain Size. Sediments within most of Marina del Rey Harbor consist of fine slits and clays, with lesser percentages of coarser sand materials. The finest sediments occur in the center of the main channel and near the bend of the Marina Del Rey Channel. The generally fine-grain size regimes within Marina del Rey Harbor reflects the low velocities within the marina channels and basins and secondly, the nature of the historical fine-grained Ballona wetland sediments from which the marina was dredged from. Coarser sediments tend to occur where current velocities are highest, near the mouth of Ballona Creek, inside the breakwall at the mouth of Marina del Rey Harbor, and in Oxford Lagoon (ABC Laboratories 1997, 2001).

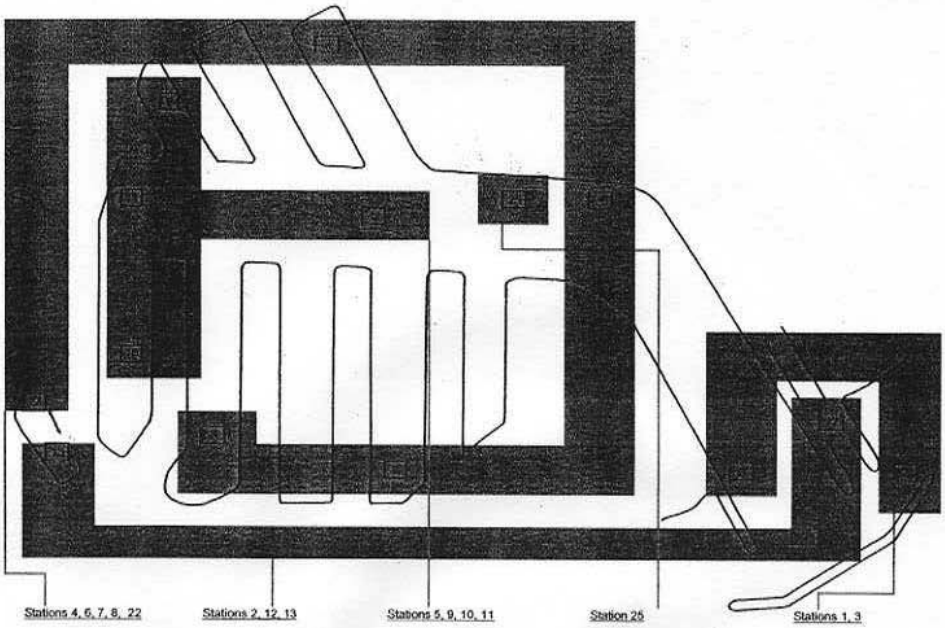
In the harbor, fine sand accounts for 10 to over 90% of the material. Within Basin B, sediments are sampled at the innermost end. In generally, circulation is reduced here, and pollution levels are usually medium-low to moderate (ABC Laboratories, 2001). The mean particle size of sediments within Basin B between 1990 and 2001 ranged from ranged <74 to 90 microns (very fine sand), which is consistent with other basin sediments that are fine- to- very fine sands.

Moffatt & Nichol (1998) investigated sediment grain size characteristics throughout Marina del Rey Harbor. Their results indicate that Basin B sediments contain substantially less silt clay percentages (59.9%) than the other basins, which ranged in silt/clay content between 80.6 (Basin D) to 100% (Basin F). The mean percent silt/clay content for nine sites in Marina del Rey Harbor was 91.5%.

Sediment Contaminants. No sediments in Marina del Rey Harbor have been measured that have levels of chemicals high enough to qualify as hazardous to humans under the California Hazardous Waste Control Law (ACOE 1999). However, the levels of certain chemicals in Marina del Rey Harbor sediments may be high enough to have negative effects on marine organisms (Soule et al. 1997, ABC Laboratories (1997, 2001), State Water Resources Control Board et al. [SWRCB et al.] (1998).

Several factors are responsible for the distribution of benthic contaminants in Marina del Rey Harbor sediments. Sediment contamination within the marina is suspected to originate from several sources, including storm water runoff from surrounding parking lots, inflow from Ballona Creek which drains much of the surrounding urbanized area, and from two storm drains, Oxford Basin and Washington Street that empty into the inner potions of the marina. Local sources include discharges and scrapings from the boats berthed in the marina and from historical industrial developments near Venice (Soule et al. 1997).

Sedimentological data collected during 2000-2001 are summarized in Figure 7. These data indicate that neither Oxford Lagoon nor Ballona Creek appear to be a source of heavy metals into the harbor during 2000; the most likely sources are



Stations 4, 6, 7, 8, 22

High in:
TBT
--
--
--
--
--
--
--
--
--
--
--
--
--
--
--
--

Low in:
DDT
Lead
Selenium

Charateristics:
High in TBT.
Low in DDT, lead and selenium. Moderate in all other chemical constituents.

Stations 2, 12, 13

High in:
TBT
DDT
Pesticides
Immediate Oxygen Demand
Oil and Grease
Organic Nitrogen
Ortho Phosphate
--
--
--
--
--
--

Low in:
Arsenic
Cromium
Copper
Iron
Manganese
Mercury
Nickel
Selenium
Chemical Oxygen Demand

Charateristics:
High concentrations of DDT, TBT, pesticides and some organics. Moderate to low in all other constituents.

Stations 5, 9, 10, 11

High in:
Arsenic
Cadmium
Chromium
Copper
Iron
Lead
Manganese
Mercury
Nickel
Silver
TBT
Zinc
TOC
Volatile Solids
Immediate Oxygen Demand
--
--
--

Low in:
Chemical Oxygen Demand
Oil and Grease
Selenium

Charateristics:
High in nearly all metals and organics. Moderate to low in all other constituents.

Station 25

High in:
Arsenic
Cadmium
Chromium
Copper
Iron
Lead
Manganese
Nickel
Silver
TBT
Zinc
TOC
Volatile Solids
Chemical Oxygen Demand
Oil and Grease
Organic Nitrogen
Sulfides
DDT
Pesticides

Low in:
Selenium

Charateristics:
High in DDT, other pesticides, most organics and metals. Low in selenium.

Stations 1, 3

High in:
TBT
Organic Nitrogen

Low in:
Arsenic
Cadmium
Chromium
Copper
Iron
Lead
Manganese
Mercury
Nickel
Selenium
Silver
TBT
Zinc
DDT
TOC
Volatile Solids
Chemical Oxygen Demand
Ortho Phosphate
Sulfides

Charateristics:
Low in DDT, other pesticides organics and metals
High in TBT and organic nitrogen.

Figure 7. Sediment Chemistry Characteristics in Marina del Rey Harbor, 2001

vessel-related and marina-related based upon distribution of sediment heavy metals. Basins B and C sediments were found to contain low concentrations of DDT, lead, and selenium and a relatively high concentration of tri-butyl tin. All other constituents during the 2000-2001 sampling period were found in moderate quantities.

The State Water Resources Control Board conducted investigations of sediment chemistry, toxicity, and benthic community conditions in Marina del Rey Harbor and other selected water bodies in the Los Angeles Region (SWRCB et al. 1998). Their data suggests that the sediments of Marina del Rey Harbor contain significant chemical contamination, and some toxicity to amphipod crustaceans. The sites sampled during the State survey were classified as "Category 5", which are sites where elevated chemical contamination is found, and that benthic studies of indicator species were of "mixed" results.

Three indices for comparing potential impacts on marine life are used to illustrate the level of potential toxicity in Marina del Rey Harbor sediments. The Long and Morgan's Effects Range Low (ER-L), Effects Range-Medium (ER-M) (Long and Morgan (1990), and the Apparent Range Effects (AET). Biological effects are most probably at or above the ER-M (Long and Morgan 1990).

An AET concentration is the sediments concentration of a selected chemical above which statistically significant biological effects always occur, and therefore, are always expected (ABC Laboratories 1997).

Chlorinated Pesticides and PCBs. Inflows from the Oxford Lagoon and Ballona Creek appear to be the primary sources of pesticides (DDT) and PCB (Arochlor 1254). Marina-wide ranges for total pesticides in 2000 were <0.5 to 17 ppb, with the value in Basin B very low (2 ppb). Generally, DDT and its derivatives have declined by an order of magnitude since 1988. Three stations in the harbor did not exceed concentrations considered to be above concentrations where adverse effects may begin to affect resident organisms or chronically impact sensitive or younger marine organisms (Station 3, harbor entrance; Station 8, Basin D; and Station 22, Oxford Channel). All harbor stations exceeded at least one pesticide sediment limit. Concentrations of these compounds in Basin B (Station 6) were low compared to all other harbor stations (ABC Laboratories 1997, 2001).

Total non-DDT pesticide concentration in 2001 ranged from 0 to 8.1 and not detected in Basin B samples. PCB values were below the detection limits of the instrumentation (<10 to <30 ppb).

Heavy Metals. The concentrations of heavy metals are highest in channel and back-basin sediments and are directly correlated to the finer sediments which attract chemical contaminants (Soule et al. 1997, ABC Laboratories 1997, 2001). Several metals (arsenic, chromium copper, iron, manganese, mercury, selenium,

silver, and tri-butyl tin) likely originate from watercraft in the marina, through either bottom paints or corrosion of the metal components of boats and their engines.

Three of four stations at the harbor entrance channel did not exceed any potential toxic limits of any metals. All remaining stations exceeded at least one metal limit of "probable" toxicity to marine organisms, as listed as toxic by NOAA. Areas which exceeded most metal limits were mid channel (Station 5 and 25), Basins D, E, F, and most channel stations (ABC Laboratories 2001).

Most heavy metal concentrations have varied over time but have not substantially increased or decreased. However, tri-butyl tin concentrations have decreased over time, most likely in response to banning of this compound in the harbor. Still, the concentrations are high enough to evolve some toxicity to marine organisms (ABC Laboratories 2001)

In 1996, Basin B sediments exceeded the ERL limits for copper (175 ppm), lead (63.6 ppm), mercury (0.715 ppm) and zinc (189 ppm) but limits at which toxicity likely occurs (ERM or AET limits) were not exceeded for any of the metal compounds. In 2001, Basin B sediments exceeded the ERL limits for cooper (182 ppm), lead (61 ppm), mercury (0.68 ppm), and zinc (194 ppm. Consequently, sediments in Basin B, according to this analysis were non-toxic relative to metal compounds. Soule, et al. (1997) also noted that these sediments had a low toxicity potential. In 1995, Basin B (Station 6) sediments were classified as medium-low toxicity, whereas nearby channel sediments (Station 5) and Basin D (Station 8) were medium-high toxicity sites. In 1991, the AET concentration for mercury was exceeded for Basin B, the channel, and Basin D.

Based on the results of the SWRCB 1997 investigation, copper, mercury, and zinc exceedances of ERM occurred in sediments from Basin E (Stations 44001, 48001) Basin D (48002), Basin B (48003), and channel stations (48004 and 48005). The results also indicated that Basin B sediments may have a higher toxic potential than indicated by the ABC Laboratories studies. ERM limits for copper (391 ppb), mercury (1.54 ppb), zinc (589 ppb), and nickel (53.9 ppb) were exceeded, whereas neither ERM or AET limits were exceeded during the 1996 ABC Laboratory surveys.

Tri-butyl tin is a toxic anti-fouling paint which was banned for use on vessels less than 25 meters in length due to its toxic effects on marine life. Within Marina del Rey Harbor, tri-butyl tin sediment concentrations in 2000-2001 were highest mid-channel (0.004-0.003 ppm), and in Basin B (0.002 ppm). In 1997, tri-butyl tin was highest in Basin E, Basin F, and at the end of the harbor channel, at ranges between 0.20 to 0.23 ppb (ABC Laboratories 1997) and lowest near the entrance channel (0.005 to 0.013 ppb). Comparatively, the TBT concentration was 0.16 ppb in Basin B in 1996, and 0.002 in 2001. Concentrations of this compound

have declined in Marina del Rey Harbor during recent years probably in response to federal laws banning of this compound.

Organic Materials (nutrients, oil and grease, carbonaceous organics). These materials enter Marina del Rey Harbor through non-point source storm water runoff from street drains, flood control channels, municipal wastewater discharges, and vessel discharges. Concentrations vary widely throughout the harbor depending on rainfall and stormwater run-off conditions. However, the distribution of these materials also follows the spatial patterns for heavy metals and is correlated to the fine sediment regimes in these areas.

2.2.3 Marine Biological Resources

Benthic Infauna. Benthic infauna are marine organisms that reside in or on the surface of the seafloor sediments. The most common types of benthic invertebrates include polychaete worms, clams, snails, and various crustacean arthropods (isopods, amphipods, cumaceans, shrimps, and crabs). The abundance, diversity, and distribution of benthic invertebrates is influenced by the physical environment (grain size, texture, compactness), the environmental quality of the sediments, and physical/chemical properties of the water above the sediments. The benthic community is used as a monitoring tool to measure potential environmental effects because they live in the sediments and do not migrate. Additionally, certain species are used as "indicator species" because they are either opportunistic and can survive under harsh man-made or natural environmental conditions, or are extremely sensitive to environmental changes and are only found in areas which are indicative of low-stressed conditions.

Prior studies in Marina del Rey Harbor indicate that the infaunal community is dominated by polychaete worms that dominate fine-grained sediments and can tolerate sediments with elevated levels of contaminants (Soule et al. 1993).

Historical analyses of the benthic community indicate nematode worms and annelid worms are the dominant phyla and contribute the most number of individuals to the infaunal community structure (Soule et al. 1993, ABC Laboratories, 2001). Less common are mollusks, crustaceans, and echinoderm species. These organisms are less abundant and diverse because it is believed that they are more sensitive to elevated levels of contaminants that occur in the sediments of Marina del Rey Harbor.

In over 25 years of sampling conducted by the Harbors Project and ABC Laboratories, the dominant types of benthic infauna in Marina del Rey Harbor include nematodes (round worms), and several species of polychaete worms typical of coastal embayments including the capitellids *Capitella capitata* and *Mediomastus ambiseta,* the cirratulid *Tharyx* spp, and the spionids *Pseudopolydora paucibranchiata and, Prionospio heterobranchiata*. Mollusks,

crustaceans, and echinoderm species that are sensitive to contaminants are relatively rare.

Infaunal communities near inflows from Oxford Lagoon and Ballona Creek appear to be undergoing moderate environmental stress (ABC Laboratories 2001). Mid-channel Marina del Rey Harbor stations also exhibited some evidence of environmental stress during the 2000 survey. These station s contained organisms that are present in sediment near wastewater outfalls or otherwise known to be present in disturbed habitats.

Species in Marina del Rey Harbor sediments cluster together into several site groups (Figure 8) based on 2001 sampling results (ABC Laboratories 2001). These include:

- Station 10, characterized by infauna organisms indicative of disturbance (Basin E) and influenced by inflow from Oxford Lagoon. High in diversity and dominance, moderate number of individuals and infaunal index values. May be indicative of stressed conditions.

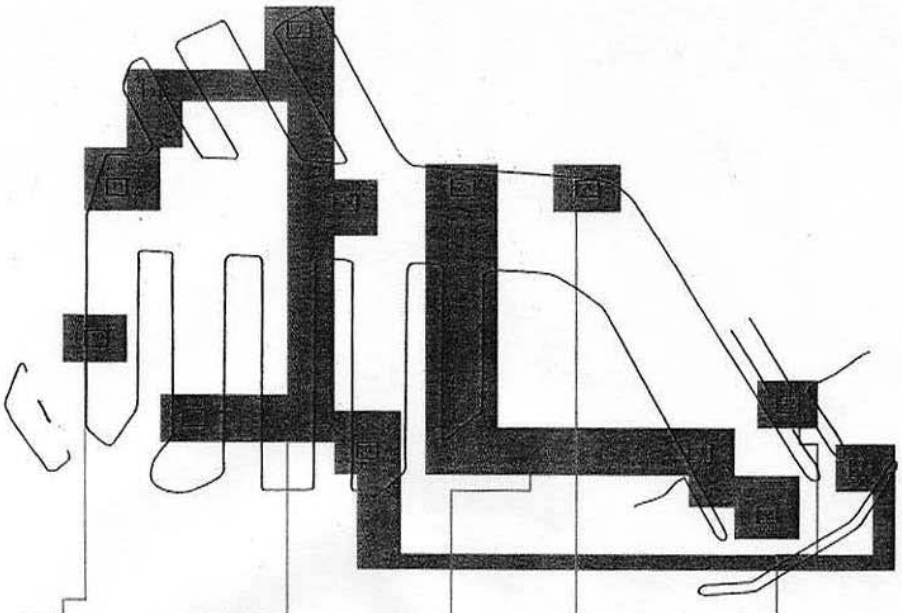
- Stations located in the channel entrance, mid-channel, Basin B, Basin D, Basin E, Basin F, and Basin H. Moderate values in most parameters, but low in number of individuals.

- Stations 2, 3 and 25 located in harbor entrance channel, and mid-channel. High numbers of individuals, high species counts, and high diversity, but low in infaunal index values. Moderately stressed benthic environment.

- Station 4, midchannel. High number of individuals, high infaunal index value, but low in diversity and dominance. Near absence of crustacean in list of top 10 species may indicate slight environmental stress.

- Station 12, Ballona Creek. High number of individuals, low diversity, and low infaunal index. Low diversity and low infaunal index values suggest this station is likely experiencing environmental stress

The average number of benthic organisms during the October 2000 survey was 1,607 and ranged between 199 (Basin B) to 4,286 (mid-outer channel), while the average number of species was 52 and ranged between 19 (Basin B) and 94 (Harbor entrance). Species diversity was 2.13 and ranged between 1.44 (Harbor entrance) to 3.33 (Harbor entrance). The dominant species at one or more stations included polychaete worms (Streblospio benedicti, *Exogone lourei, Aphelochaetea multifilis*, *Leitoscoloplos pugettensis, Mediomastus* spp., *Euchone*



Station 10	Stations 1, 5, 6, 7, 8, 9, 11	Stations 2, 3, 25	Station 4	Station 12
High in: Diversity Dominance --	**High in:** -- -- --	**High in:** Individuals Species Diversity	**High in:** Individuals Infaunal Index --	**High in:** Individuals -- --
Low in: -- -- --	**Low in:** Individuals -- --	**Low in:** Infaunal Index -- --	**Low in:** Diversity Dominance --	**Low in:** Diversity Infaunal Index --
Dominants: *Streblospio benedicti (p)* *Aphelochaeta "parva" (p)* *Euchone limnicola (p)* *Mediomastus spp. (p)* *Pseudopolydora paucibranchiata (p)* Oligochaeta (o) * *Ceulleria pacifica (p)* *Exogone cf verugora (p)* *Lumbrineris sp. C (Harris) (p)* Nematode (n) *	**Dominants:** *Mediomastus spp. (p)* *Leitoscoloplos pugettensis (p)* *Lumbrineris sp. C (Harris) (p)* *Exogone sp. (p)* *Phoronis sp. (ph)* *Aphelochaeta "parva" (p)* *Euchone limnicola (p)* *Pseudopolydora paucibranchiata (p)* *Carinoma mutabilis (ne)* *Lumbrineris sp. (p)*	**Dominants:** *Mediomastus spp. (p)* *Phronospio heterobranchia (p)* *Laevicardium substriatum (b)* *Protothaca staminoa (b)* Nematode (n) * *Carinoma mutabilis (ne)* *Phoronis sp. (ph)* Oligochaeta (o) * *Exogone cf verugora (p)* *Notomastus sp. 1 (Phillips) (p)*	**Dominants:** *Phoronis sp. (ph)* *Pseudopolydora paucibranchiata (p)* *Mediomastus spp. (p)* *Exogone sp. (p)* *Prionospio heterobranchia (p)* *Rudilemboides stenopropodus (c)* *Euchone limnicola (p)* *Polyophthalamus pictus (p)* *Armandia brevis (p)* * *Exogone lourei (p)*	**Dominants:** *Mediomastus spp. (p)* *Armandia brevis (p)* * *Polyophthalamus pictus (p)* *Dorvillea (Schistomeringos) annulata (p)* * *Prionospio heterobranchia (p)* *Ericthonius brasiliensis (c)* *Prionospio lighti (p)* *Pseudopolydora paucibranchiata (p)* *Notomastus sp. 1 (Phillips) (p)* *Oxyurostylis pacifica (c)*
Characteristics: Two species present which are indicative of a stressed benthic environment.	**Characteristics:** Moderately healthy group with some evidence of stress.	**Characteristics:** Two species present which are indicative of a stressed benthic environment.	**Characteristics:** One species present which is indicative of a stressed environment.	**Characteristics:** Two species present which are indicative of a stressed benthic environment.

(p) = polychaete worm, (o) = oligochaete worm, (n) = nematode worm, (c) = crustacean, (b) = bivalve, (ph) = phoronid worm, (ne) = nemertean worm

* Infaunal species known to be associated with disturbed benthos.

Figure 8. Benthic Community Cluster Analysis, 2000. (ABC Labs)

limnicola, Dorvillea sp., Lumbrineris sp. C, Pseudopolydora paucibranchiata and worms, the phoronid worm *Phoronis* sp., and the amphipod crustacean *Rudilemboides stenopropodus.*

Benthic studies conducted in 1997 (SWRCB et al. 1998) indicated that the Marina del Rey Harbor benthic community structure was negatively correlated with heavy metals, several pesticides, and PCBs, sediment grain size, and Total Organic Carbon (TOC). Similar to the results of ABC Laboratories studies, this report concluded that the Basin B benthic community was transitional between degraded and healthy (reference sites). Toxicity tests, based upon the survival of amphipods over a 10 day period suggested that toxicity was highest in the basin samples (including Basin B) and negatively correlated with metals, tri-butyltin, ERM exceedances, and percent clay.

Benthic Macrofauna-Hardscape. Hardscape, including jetties, breakwalls, rock rip-rap, pilings, and piers support a range of benthic algae and benthic invertebrates. In surveys conducted in May 2006 and December 2006, CRM observed a total of 24 species of plants and invertebrates living on the hardscape of seawalls and rip-rap located where proposed seawall void repairs are proposed at 26 sites (CRM 2006a and CRM 2007). Highest richness of plants and invertebrates occurs on the jetties and breakwall near the harbor entrances. Richness is substantially less on rip-rap and seawalls located farther back in the Marina del Rey Harbor basins.

Red algae taxa observed during the CRM studies included *Coralline* turf (*Corallina pinnatafolia*)*,* and a complex of red algal turf species which likely included *Polysiphonia* sp. and *Chondracanthus spinosus.* The brown algae *Sargassum muticum* was moderately abundant throughout the marina, while the brown algae *Dictyota binghamiae* was observed only in Basin B*.* It likely occurs in other basins as well. All of these taxa were observed either on the seawall or on the protective rip-rap. Invertebrates observed by biologists included sponges (*Haliclona* sp.), unid hydroids, proliferating anemones (*Epiactis* sp), anemones (*Anthopleura xanthogrammica*), burrowing anemones (*Pachycerianthus fimbriatus*), California sea whips (*Muricea californica*), polychaete worms *(Dodecaceria fewksii*, Spirorbidae, unid.) limpets (*Tectura limatula*), amphipods (*Grandidierella japonica*), California lobster (*Panilurus interuptus*), octopus (*Octopus bimaculatus*), predatory sea slugs (*Navanax inermis*), nudibranchs (*Dialula sandiegensis)*, gastropods (*Pteropurpura festiva*), mussels (*Mytilus galloprovincialis*), oysters (*Ostrea conchilcola*) ectoprocts (*Bugula californica,* orange bryozoan, unid*.*), short-spined sea stars (*Pisaster brevispinus*), tunicates (*Botryllus/Botrylloides* complex, *Styela montereyensis, Styela plicata,* Ascideacea, unid). Most of the seawall and rip-rap within Basin B areas support a low diversity of plants due to low light levels and high silt cover within the marina basin similar to the conditions observed in Figure 9a and 9b (CRM 2006a, 2007).

Figure 9a. Encrusting organisms and silt on rip-rap at the base of seawall

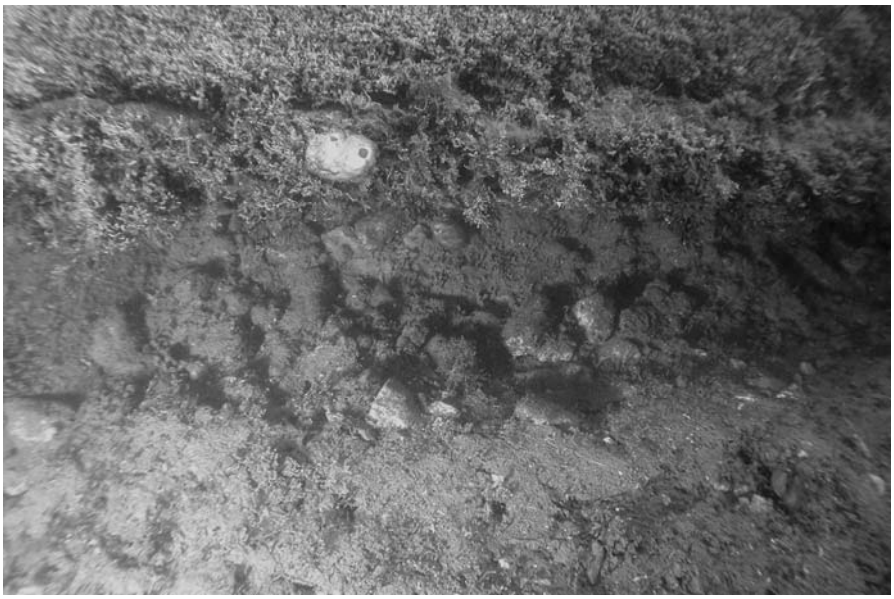


Figure 9b. Coralline algae, tunicates, and other rip-rap and seawall associated organisms typical of low-diversity basin habitats. Source Photo: Concept Marine Associates)

The most common types of invertebrates observed during site-specific dive surveys at the Basin B project site included mussels, limpets, barnacles, hydroids, ectoprocts and tunicates.

In October 2006, CRM biologists identified four algal and 12 invertebrate taxa at the Basin B project site (CRM 2006b). These included a red-algal turf, consisting of *Polysiphonia* sp. and *Chondracanthus spinosus* was observed on the rip-rap. The brown algae *Sargassum muticum* and *Dictyota binghamiae* were also observed on the rip-rap, with *Sargassum* being the most abundant brown algae. Invertebrates observed included sponges (*Haliclona* sp.) unid hydroids, burrowing anemones (*Pachycerianthus fimbriatus*), limpets (*Collisella limatula*), mussels (*Mytilus galloprovincialis*), oysters (*Ostrea conchilcola*), ectoprocts (*Bugula californica,* orange bryozoan, unid.), and tunicates (*Botryllus/Botrylloides* complex, *Styela montereyensis, Styela plicata,* Ascideacea, unid).

Fishes. In addition to benthic and water quality sampling, the County's monitoring program also includes annual sampling of the ichthyofauna and ichthyoplankton at several stations within the marina. The ichthyofauna sampling comprises multi-mesh, 45-minute gill net sets at two stations, ten-minute otter trawls at three stations, beach seining within Basin D, and diver observations along three transects located near the breakwalls at the mouth of the marina. Near-surface and near-bottom ichthyoplankton tows are conducted at three stations using a 333 micron net.

Marina del Rey Harbor waters are a viable habitat and nursery for 111 species of marine fish based on several studies of the fish populations conducted in Marina del Rey Harbor since 1977 (ABC Laboratories 2001). In 2000, ABC Laboratories identified 47 species and 16,884 individuals of all age groups (including larvae and eggs) using a combination of trawl net sampling for bottom fish, gill net sampling for midwater fish, beach seine sampling for inshore fish, plankton net sampling for larval fish and eggs, and diver transect enumeration for reef fishes (ABC Laboratories 2001). The bottom fishes of the main channels and basins are characterized by the occurrence of several species such as California halibut (*Paralichthys californicus*), barred sand bass, white croaker (*Genyonemus lineatus*), bat ray (*Myliobatis californicus*), and round stingray (*Urolophus halleri*). Ichthyoplankton collections are dominated by goby, and blenny larvae during the summer and winter months; anchovy larvae are abundant during the summer sample periods.

Allen (1991) provides a list of fishes collected during an otter trawl survey of Ballona Creek and Marina del Rey Harbor in 1990 and 1991. The most abundant fishes collected by otter trawl were pelagic (near surface) taxa, including queenfish (*Seriphus politus*) and northern anchovy (*Engraulis mordax*). Gill net and trawl catches in Basin B (Station 6) in 1995 through 1997 by Soule et al. (1997) and ABC Laboratories (1997) were dominated by topsmelt (*Atherinops affinis*). In 2000-2001, the most abundant fishes collected by otter trawl and gill

net were northern anchovy, topsmelt and shiner perch (*Cymatogaster aggregata*). In Basin D (Station 8), the nearest station to Basin B, the most abundant species in May 2001 were topsmelt and shiner perch.

Topsmelt, northern anchovy, and deepbody anchovy are common schooling fishes found throughout the marina waters-northern anchovy are generally found nearest the harbor entrance, whereas both topsmelt and deepbody anchovy occur throughout the basins.

Common reef-associated species found primarily along the jetties and breakwall, and secondarily and less-frequently around the hardscape of rip-rap, pilings, and piers farther into the channels of Marina del Rey Harbor include senorita *(Oxyjulis californica*), opaleye (*Girella nigricans*), sargo (*Anisotremus davidsoni*), black *(Embiotoca jacksoni*), shiner surfperch (*Cymatogaster aggregata*), blacksmith (*Chromis punctipinnus*), barred sand bass (*Paralabrax nebulifer*), kelp bass (*P. clathratus*), black croaker (*Cheilotrema saturnum*) and pile perch (*Damalichthys vacca*).

CRM (2006a) identified eight different types of fish at 26 locations in Marina del Rey Harbor where proposed seawall void repairs are proposed. These species included topsmelt (*Atherinops affinis*), opaleye perch (*Girella nigricans*), unid perch (Embiocidae, unid.), pile perch *(Damalichthys vacca*), unidentified croaker (Sciaenidae, unid.), kelp bass (*Paralabrax clathratus*), unidentified turbot (*Pleuronichthys* sp.), and round sting ray (*Urolophus halleri*). Most occurrences of fish observed during the underwater surveys occurred along the seawalls that lined the main channel of Marina del Rey Harbor and within Basin B (BW7-BW9).

In October 2006, CRM biologists identified six types of fish along the seawall in front of Parcel 9U (CRM 2006b) including topsmelt (*Atherinops affinis*), opaleye perch (*Girella nigricans*), unid perch (Embiocidae, unid.), barred sand bass (P*aralabrax nebulifer),* unidentified turbot (*Pleuronichthys* sp.), and round sting ray (*Urolophus halleri*).

2.2.4 Sensitive Biological Resources

Table 1 lists the wildlife sensitive species which could potentially occur within Marina del Rey Harbor (ACOE 1998). Five species that are listed as threatened or endangered by the State and/or the Federal government have a potential to occur in the vicinity of Marina del Rey Harbor. Eleven species, designated as Species of Special Concern could also occur in the Marina del Rey Harbor region. In addition, two seagrass species and two species of fishes are considered sensitive that have a potential to occur within Marina del Rey Harbor that have no official listing but are considered sensitive by resource agencies.

Table 1. Listed Wildlife Species Potentially Occurring in Marina del Rey Harbor
Source: Army Corps of Engineers 1998

Scientific Name	Common Name	Status[1]	Potential for Occurrence[2]
CLASS AVES	BIRDS		
GAVIIDAE	LOONS		
Gavia immer	common loon	CSC	H
PELECANIDAE	PELICANS		
Pelecanus occidentalis californicus	California brown pelican	SE,FE	H
PHALACROCORACIDAE	CORMORANTS		
Phalacrocorax auritus	double-crested cormorant	CSC	H
ARDEIDAE	HERONS, BITTERNS		
Ixobrychus exilis hesperis	Western least bittern	CSC	L
FALCONIDAE	FALCONS, CARACARAS		
Falco peregrinus anatum	American peregrine falcon	FE, SE	H
CHARADRIIDAE	PLOVERS		
Charadrius alexandrinus nivosus	Western snowy plover	FT,CSC	M
SCOLOPACIDAE	SANDPIPERS, PHALAROPES		
Numenius americanus	long-billed curlew	CSC	L
LARIDAE	GULLS, TERNS, AND SKIMMERS		
Larus californicus	California gull	CSC	H
Sterna elegans	elegant tern	CSC	H
Sterna antillarum browni	California least tern	FE,SE	H
Chlidonias niger	black tern	CSC	L
Rynchops niger	black skimmer	CSC	M
ALCIDAE	AUKS		
Cerorhinca monocerata	rhinocerus auklet	CSC	L
LANIIDAE	SHRIKES		
Lanius ludovicianus	loggerhead shrike	CSC	L
EMBERIZIDAE	EMBERIZIDS		
Geothlypis trichas sinuosa	saltmarsh common yellowthroat	CSC	L
Passerculus sandwichensis beldingi	Belding's savannah sparrow	SE	L

1 Status
- FT = Listed as a Threatened Species by the Federal Government
- FE = Listed as an Endangered Species by the Federal Government
- FPE = Federal Proposed Endangered
- CSC = California Department of Fish and Game Species of Special Concern
- CFP = Taxa is fully protected in the State of California
- SE = Listed as an Endangered Species in the state of California

2 Potential for Species to Occur Onsite
- L = Low potential to occur within the project area
- M = Moderate potential to occur within the project area
- H = High potential to occur within the project area

Seagrasses. Eelgrass (*Zostera marina*) is a marine flowering plant that grows in soft sediments in coastal bays and estuaries, and occasionally offshore to depths of 50 feet (ft). Eelgrass canopy (consisting of shoots and leaves) and the vertical relief it provides enhances the abundance and the diversity of marine invertebrates and fishes compared to areas where the sediments are barren. Historically, there have been no records of eelgrass (*Zostera marina*), growing within Marina del Rey Harbor.

CRM conducted eelgrass surveys in Marina del Rey Harbor in May and December 2006 for proposed County of Los Angeles funded seawall repairs at 27 sites throughout the harbor, including the proposed Basin B public dock area. No eelgrass was found during these surveys (CRM 2007, 2006 a).

Additionally, focused site-specific eelgrass surveys were conducted by CRM in October 2006 along the extreme inward seawall of Basin B in the immediate vicinity of the proposed public dock and pumping station seaward of Parcel 9U (Figure 10. CRM Inc. 2006b). A total of thirty-one 98.8 foot (30 meter)-long transects were swam perpendicular to the seawall at 10 ft (3 m) intervals. Bottom type, common marine life, and the presence or absence of eelgrass and invasive algae were recorded. Neither eelgrass nor invasive algae were found within the project survey area.

Ditchgrass (*Ruppia maritima*) is an uncommon form of sea grass in southern California found in quiet water habitats. It also serves as an important habitat for larval and fishes that use the seagrass for cover and protective purposes. It has only been reported within Basin D (Mother's Beach) and has occurred irregularly since 1979 (Soule et al 1993, 1996).

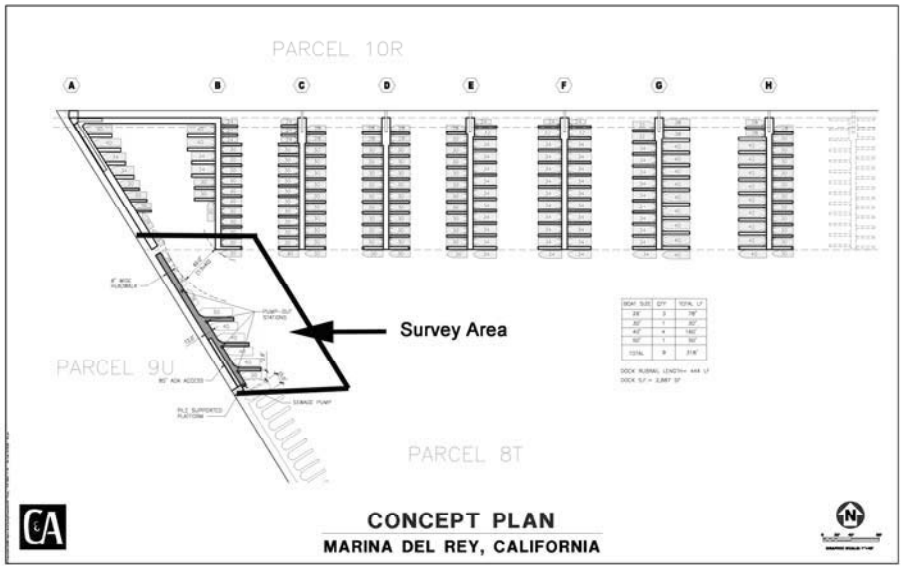


Figure 10. Location of Focused Eelgrass and Invasive Algae Surveys, October 17th, 2006 (Source: CRM, Inc. 2006b)

Fishes. The Tidewater Goby (*Eucyclogobius newberryi*) is a Federally-listed endangered species that has been expatriated from many southern California creek mouths. It is currently found in shallow marine areas and lower reaches of streams between San Diego northward to Humboldt County waters where salinity is less than 10 ppt. The population of Tidewater Goby is depleted due to reduced or eliminated flows in the lower reaches of coastal streams, pollution, and the filling in, channelization, and other physical alterations of their habitats. The population disappeared from about 74 percent of the coastal lagoons from Morro Bay southward to San Diego (U.S. Fish and Wildlife 1994). It does not occur within Marina del Rey Harbor or the Ballona Channel.

Although it does not have a formal special status, the California halibut (*Paralichthys californicus*) is considered a sensitive species by resource agencies because of its commercial value and a continued region-wide reduction of its nursery habitat in bays and wetlands. California halibut spawn at sea and its larval stages are planktonic. After several months, larval fish settle to the bottom and migrate into shallow coastal waters including embayments such as Marina del Rey Harbor. Young-of-the-Year (YOTY) prefer shallow waters between about -1.5 feet and -3.5 feet MLLW, whereas juveniles prefer deeper channel bottoms to a maximum depth of approximately -15 feet MLLW. After spending nearly nine months in coastal embayments, juveniles move out into the open coastal environment. The species uses inshore waters of bays, harbors, and estuaries as a nursery habitat. California halibut frequenting the entrance channel habitat more commonly than farther back in the channels or boat basins.

Birds. Of the listed species, the California least tern (*Sterna antillarum browni*) and the California brown pelican (*Pelecanus occidentalis californicus*) have the highest potential to be occur in the Basin B area and back channel habitats of Marina del Rey Harbor.

The California least tern, a federal-and state-endangered species, nests on Venice Beach between March and early September each year. During the 2006 breeding season, there were 384 nests and between 280-320 fledglings (Kathy Keane, pers. com. with R. Ware, January 5th, 2006). In 1998, 373 nesting pairs used that area. In 1997 and 1996, 375 and 271 pairs used the site, respectively (ACOE 1998). The least tern colony on Venice Beach is an important nesting colony in California. Both adults and juveniles will likely to be found in Marina del Rey Harbor during the breeding season. Least terns forage on juvenile baitfish within a 1-to-2 mile radius of the nesting site. Most foraging activity occurs in near shore ocean waters between Venice Pier and immediately downcoast of the entrance to Marina del Rey Harbor, and, secondarily, within the marina, particularly just inside the breakwall (ACOE 1998). Other foraging habitats observed for this species include Ballona Lagoon, the Del Rey freshwater pond, tidal channels of the Ballona wetlands, and the Ballona Channel near the confluence with the ocean. This species requires relatively clear water to locate its prey and thus turbid surface water conditions have a potentially negative

effect on this species' ability to feed on its preferred baitfish food sources, northern anchovy, topsmelt, and jacksmelt.

Brown pelicans will roost along the Marina del Rey Harbor breakwall, and various docks throughout the harbor. Pelicans will forage both inside and outside the marina, primarily on northern anchovy. This species forages along the entire coastline year-around, but only breed offshore on the Channel Islands and to the south in Mexico and the Gulf of California. Pelican monitoring studies conducted by Keane Biological Consultants in December 2006 reported that there were approximately 300+ pelicans roosting and foraging in the Harbor entrance channel along the jetties (Kathy Keane, pers. com. with R. Ware, January 5th, 2006).

Invasive Algae. The invasive algae Caulerpa taxifolia was introduced into southern California in 2000 (Agua Hedionda Lagoon) and 2001 (Huntington Harbor) by way of individuals likely dumping their aquaria waters into storm drains, or directly into the bays. While outbreaks have been contained, the Water Resources Board, through the National Marine Fisheries Service and the California Department of Fish and Game, require that projects that have potential to spread this species through dredging and bottom-disturbing activities conduct pre-construction surveys to determine if this species is present, and, if so, to eradicate the species prior to construction of the project, using standard agency-approved protocols and by National Marine Fisheries Service/California Department of Fish and Game Certified Field Surveyors.

Caulerpa taxifolia has a potential to cause ecosystem-level impacts on California's bays and nearshore systems due to its extreme ability to out-compete other algae and seagrasses. *Caulerpa taxifolia* grows as a dense smothering blanket, covering and killing all native aquatic vegetation in its path when introduced in a non-native marine habitat. Fish, invertebrates, marine mammals, and sea birds that are dependent on native marine vegetation are displaced or die off from the areas where they once thrived. It is a tropical-subtropical species that is used in aquariums.

Invasive algae surveys were conducted along with eelgrass surveys in Marina del Rey Harbor for the County's seawall void repair project. One site included seawall panels in the immediate vicinity of the proposed public dock (CRM 2006c and 2007b). A total of 3.2 acres of bottom habitat was surveyed throughout Marina del Rey Harbor. No invasive algae was observed during these two focused marine biological surveys.

In October 2006, CRM (2006d) conducted a focused underwater invasive algae survey at the proposed site of the public dock and pump out station (Figure 9). The total survey area (Area of Potential Effect, or the APE) was 29,052 sq ft (2,700 sq meters). Based upon underwater visibility conditions, which averaged 6 ft (3 ft on each side of the center line that the biologists followed), the actual

amount of bayfloor observed by the biologists was 18,302 sq ft (1,701 sq m). This accounted for 63% of the total APE bayfloor habitat within the project limits. A minimum of 20% coverage is required for non-infected systems such as Marina del Rey Harbor.

3.0 PROJECT ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

3.1 LANDSIDE PROJECT COMPONENTS

3.1.1 Parcel 10R, Parcel FF & Waters Abutting Parcel 9U Bulkhead

Legacy Partners has made application to the County of Los Angeles for approval of a Coastal Development Permit to authorize the demolition of all site improvements on County Parcel 10R, which include 136 existing apartment units and appurtenant parking, landscape and hardscape facilities. Post-demolition, Legacy Partners proposes to construct an apartment complex on Parcel 10R containing 400 rental dwelling units in three (3) apartment buildings (4 residential floors over 2 levels of at-grade and partially subterranean structured parking) with private courtyard and outdoor recreation (pool) areas, a 28-ft.-wide public Waterfront Stroll Promenade along the entire waterfront extent of the parcel, and appurtenant common landscaped and hardscaped facilities.

Legacy Partners has also made application to the County for “Coastal Approval in Concept” reviews pertaining to its planned demolition of the existing “Neptune Marina” anchorage and the subsequent construction a new private marina on the waterside portion of Parcel 10R; and for its development of a public/”transient” anchorage abutting the Parcel 9U bulkhead. The planned waterside development on both Parcel 10R and abutting Parcel 9U will be within marina “Basin B”. The existing marina to be demolished at Parcel 10R under Legacy Partners’ waterside development proposal contains 184 boat slips and 14 end-tie spaces. Legacy Partners’ proposed new private marina on the waterside portion of Parcel 10R will contain 161 boat slips and 13 end-tie spaces, with contemporary, appurtenant landside (boaters’ restrooms, lounge and parking) and waterside (dock-side utilities and a bilge/sewage pump-out station) facilities. Legacy Partners’ proposed new public anchorage to abut the Parcel 9U bulkhead will contain approximately 542 lineal feet of public/transient vessel docking space and would provide berthing for between seven and 11 transient vessels (depending on the boats’ size) as well as a dingy berthing area at the northerly end of the anchorage (see Figure 4 for detail).

Under a separate Coastal Development Permit request filed with the County, Legacy Partners is proposing to demolish an existing surface parking lot on Parcel FF and to subsequently construct one apartment building containing 126 rental dwelling units (4 residential floors over 2 levels of at-grade and partially subterranean structured parking) with private courtyard areas; a 28 ft.-wide public

Waterfront Stroll Promenade along the entire waterfront extent of the parcel; and appurtenant common landscaped and hardscaped facilities.

Legacy Partners' combined proposed development of Parcels 10R & FF and the waters abutting the Parcel 9U bulkhead will, therefore, result in construction of 526 apartment dwelling units on Parcels 10R and FF (a net gain of 390 dwelling units), a private marina containing 161 boat slips and 13 end-tie spaces with appurtenant water-based boater-serving facilities on the water portion of Parcel 10R, and a public/"transient" anchorage abutting the Parcel 9U bulkhead.

3.1.2 Parcel 9U

Woodfin has filed a separate Coastal Development Permit with the County to authorize, on the northerly portion of Parcel 9U, the construction of a 19-story, 288-room hotel and vacation ownership resort structure (up to 152 conventional hotel suites and 136 vacation ownership/"timeshare" suites) containing an assortment of accessory uses typical of the resort environment (i.e., cocktail lounge, restaurant, pool, spa). The project includes an adjoining six-level parking garage to the north the hotel/vacation ownership structure (5 parking levels above ground and 1 parking level underground). The Project also includes construction of a 28-foot-wide public pedestrian promenade along the parcel's entire water frontage.

Concurrently with the above described development, Legacy Partners and Woodfin will partner in jointly funding the development of an approximately 1.46-acre public wetland park on the southerly portion of Parcel 9U.

3.1.3 Storm Drain Systems

Existing storm drain runoff system (Source: Fuscoe Engineering, Inc. 2006). The existing site is divided into two distinct drainage areas. The first area is an existing apartment complex south of Marquesas Way. The area sheet flows at approximately 2% in a southerly and easterly direction to a series of yard drains with grate inlets to Basin "B". The second area is an existing parking lot, north of Marquesas Way, which sheet flows at less than 2% to a series of yard drains with grate inlets to Basin "C". The inlets for both drainage areas drain directly to the ocean thru the marina bulkhead via a pipe (Basin "B" & "C"). There are two inlets for the existing parking lot area to the Basin "C" and 24 inlets for the apartment complex area to Basin "B". None of the runoff is currently being treated prior to discharge into Marina Del Rey Harbor. The current 25 year storm flow is 4 cfs for Basin "C" and 16cfs for Basin "B".

Proposed storm drain runoff system. (Source: Fuscoe Engineering Inc. 2006) The proposed storm drain facilities for the apartment site will have two storm drain systems. Each system will consist of a series of yard drains with grate inlets similar to the existing system. The proposed drainage areas will remain similar to

the existing drainage areas. The two storm drain system will utilize the existing marina bulkhead inlets. The drainage will continue to flow to the ocean through existing bulkhead drains. With the proposed project the existing walkways and grates will be replaced, revitalizing the area, but retaining the existing storm drains outfalls. The proposed 25-year storm flow is 4 cfs for Basin "C" and 16 cfs for Basin "B". There is no net change in run-off due to development.

3.2 EFFECTS OF ANY ADDITIONAL POLLUTANTS DUE TO INCREASED RUNOFF CAUSED BY NEW DEVELOPMENT

Hypothetically, additional pollutants could potentially be generated from the proposed project components and could contaminate Marina del Rey Harbor water column and sediments. These contaminants would enter Marina del Rey Harbor during storm water or dry-weather runoff events through storm drains that discharge in Basins B and C, the maintenance of the 161-slip marina and the public dock facility, and vessel-related discharges.

Potential sources of contaminants in surface runoff include household and industrial wastes, accidental spills, sewer overflows and vessel pump-out facility leaks, septic tank leaks, illegal and illicit connections, excess runoff and chemicals from landscape irrigation, rubbish, used crankcase oil, grease, food by-products, wash water, debris discarded from the street, animal droppings, and settled air pollutants (Santa Monica Bay Restoration Project 1994).

Street runoff carries metal, rubber, and oil residues from highways, while garden runoff carries pesticides (Soule et al. 1992). The sources of constituents in runoff are highly variable. In studies conducted by UCLA and Woodward Clyde Consultants (1992), oil and grease are dominant constituents in runoff from multi-family residential, commercial, public, light industrial, and other urban areas. BOD in a dominant constituent from single family residential areas. Single-family residential areas contribute the highest percentage of BOD, COD, total phosphorous, soluble phosphorous, TKN, nitrite and nitrate, copper, lead, and zinc. Open space contribute the highest percentage of total suspended solids. Additional contaminants (copper, chromium, lead, zinc, mercury) may enter Marina del Rey Harbor as a consequence of increased maintenance of an overall larger number of watercraft docked within the boat basins. Other than tying in dry-weather flows to the County's sewage system, source control and initial runoff clarification prior to discharge are the only ways to reduce the level of contamination in urban runoff besides implementing public education and involvement programs.

3.2.1 Potential Short-term Effects of Storm Drain Improvements

The proposed 25-year storm flow is 4 cfs for Basin "C" and 16 cfs for Basin "B". There is no net change in run-off due to development. The two storm drain

system will utilize the existing marina bulkhead inlets. The drainage will continue to flow to the ocean through existing bulkhead drains.

Short-term construction-related effects landward of the harbor could potentially result in:

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- Localized increases in water turbidity at existing drain structures in Basins B and C resulting from landward storm drain improvements;

- Short-term mortality to marine life in the immediate vicinity of the construction due to burial of soft bottom or rip rap habitat should landward side storm drain construction generate sediment flows that enter the harbor through existing drains; and

- Movement of fishes out of the local area where sediment plumes arise from the storm drains.

3.2.2 Mitigation for Short-term Storm Drain Improvements

Short-term increases in water turbidity can be mitigated to a less-than-significant level by implementing Best Management Practices such as sand-bags, straw waddles, and siltation screens around the project site to minimize the spread of any sediments into existing storm drains during construction.

Potential mortality of benthic invertebrates in the immediate vicinity of storm drains and movement of fishes away from the construction zones will be mitigated by implementing project water quality mitigation measures identified in the Neptune Marina Conceptual Water Quality Plan (Fuscoe Engineering 2004).

3.2.3 Potential Long-term Effects of Stormwater Runoff from the Project Site on Marina del Rey Harbor Water Quality

The proposed 25-year storm flow is 4 cfs for Basin "C" and 16 cfs for Basin "B". There is no net change in run-off due to development. The storm drain system will consist of a series of yard drains with grate inlets similar to the existing system. The proposed drainage areas will remain similar to those existing at the project site.

- Existing storm drains currently discharge into Basins B and C. Consequently, storm water runoff into Marina del Rey Harbor will continue to flow into the harbor as a result of the project. However, flow is not expected to increase as a consequence of storm drain improvements and constituents in the runoff are anticipated to be similar to those in the existing runoff. Yard drains with grate inlets similar to the existing system will continue to control storm water velocity and turbidity; and

- In the long-term, water quality into Marina del Rey Harbor will not be adversely affected by project site runoff into the harbor if storm water and dry weather runoff Water Quality Best Management Practices are implemented as designated in the project's Water Quality Management Plan (Fuscoe Engineering Inc. 2004).

3.2.4 Potential Long-term Biological Impacts Related to Stormwater Runoff and Contaminants Generated by the Project

No long-term adverse impacts to biological communities are anticipated to result from the proposed project since Water Quality BMPs and mitigation measures are incorporated into the project.

However, in the absence of such water quality BMPs and mitigation measures:

- Benthic communities in Basin B and Basin C could transition from Transitional" to a "Degraded" benthic communities as a result of higher toxicity from increased contaminant loading in the fine-textured sediments of the Basins B and C;

- Species richness and diversity of the benthic community in Basin B and C could decline with a greater number of opportunistic species of polychaete worms and nematodes and:

- Fewer species of fish would utilize Basin B and Basin C waters.

3.2.5 Mitigation for Potential Negative Biological Impacts Related to Long-term Effects of Stormwater Runoff From the Project Site into Marina del Rey Harbor.

Potentially significant biological impacts related to stormwater or nuisance runoff are mitigated by the inclusion of Construction and Long-Term BMPs of the County of Los Angeles Department of Public Works Urban Stormwater Mitigation Plan in the project design (Fuscoe Engineering Inc. 2004) and complying with National Pollution Discharge Elimination System (NPDES) discharge requirements to reduce and/or prevent contaminants from entering Marina del Rey Harbor. Examples of BMPs to limit storm water and or summer nuisance waters from entering Marina del Rey Harbor include:

- Collection and clarification of runoff from roofs and pavement areas prior to discharge into storm drains;

- Adherence to stringent and efficient street and marina parking lot cleaning practices to collect and reduce street-associated dust, trash, and pollutants;

- Education of the residents on the effects of runoff and vessel maintenance activities on Marina del Rey Harbor; and

- Enforcement of city codes, county codes, and state and federal waste discharge and boat hull cleaning laws and regulations.

3.3 POTENTIAL CHANGES IN WATER TEMPERATURE AND BIOLOGICAL PRODUCTIVITY CAUSED BY OUTFALLS, RUNOFF, OR A DECREASE IN LIGHT ENTERING THE WATER DUE TO SHADING (NEW BUILDINGS)

3.3.1 Thermal and Wastewater Outfalls

Thermal and wastewater outfalls constructed for the project changes could result in increased Basin B water temperatures, higher organic loads, and increased water column and harbor sediment contamination. Such changes could lead to eutrophication, decreases in biological productivity and species diversity, changes in community structure that favor species that have greater tolerances to stresses and the promotion of invasive species uncommon to the area.

3.3.2 Potential Thermal and Wastewater Effects

No thermal or wastewater outfalls are part of the project design which preclude adverse impacts on harbor resources.

3.3.3 Mitigation for Thermal and Wastewater Outfall Effects

No mitigation is required.

3.3.4 Shadow Effects of New Buildings

The Legacy development on Parcel 10R includes 400 rental dwelling units in three (3) apartment buildings (4 residential floors over 2 levels of at-grade and partially subterranean structured parking. On Parcel FF, the development includes one (1) apartment building containing 126 rental dwelling units (4 residential floors over 2 levels of at-grade and partially subterranean structured parking.

The proposed Woodfin project has two components, the Woodfin Main Facility and the Woodfin hotel/timeshare tower. Each is situated in the northern portion of Marina del Rey Parcel 9U. The Woodfin Main Facility is located to the north and would be approximately 69 feet above finished grade. The connected Woodfin hotel/timeshare tower (located south of the Woodfin Main Facility) would be approximately 225 feet high with an appurtenant rooftop elevator machine room extending to 242 feet above finished grade.

The winter and summer solstices mark the shortest and longest daylight periods of the year, respectively. For the northern hemisphere, the winter solstice (December 21st) means the sun is farthest from the earth in terms of its elliptical orbit and the arc of the sun's travel through the sky is both its lowest and shortest. The sun's angle during the winter solstice is responsible for casting the longest shadows of the year, with peak shadows occurring shortly after sunrise and before sunset. Conversely, the shortest shadows of the year are cast during the summer solstice (June 21st). During the summer, when the sun's arc is considerably higher and the sun is positioned nearly directly overhead at midday, shade effects are greatly diminished. It is anticipated that there would be some shading of the proposed Legacy Partners buildings and in Basin B particularly at sunrise and sunset when shadows are longest, but these shading effects would not be greater than those at the winter solstice.

For the purposes of this evaluation, only the shade and shadow effect during the winter solstice were visually rendered. Therefore, the findings presented below therefore represent a "worst-case scenario" for shade effects on neighboring property and on Basin B waters. (Note: The previous discussion on winter and summer solstice was extracted from the Woodfin shading analysis, undated memo provided to CRM by John Santry, Legacy Partners Residential, Inc.)

Parcel 10R and FF Shading Extent. Under worst case December conditions, the landside apartment complex project on Parcel 10R and FF will generate a minimal amount of building-related shading in Basin B and Basin C. These shading effects will occur in front of apartments on the southwest side of the property of Parcel 10R and apartments on the north side of the property facing Basin C.

Parcel 9U Shading Extent. Worst-case shading effects would occur during winter afternoons and would be maximum during the winter solstice in December. Shadows cast by the Woodfin Project would, over the course of the day, shade portions of Via Marina, the proposed Legacy Partners project, the Waterfront Stroll Promenade, and the waters and anchorages of Basin B of Marina del Rey (Figure 11), primarily from the Woodfin Tower building and secondarily from the Main Tower. Note: Anchorage "Dock" designations 1-5 in this shading study in Figure 10 indicate "existing" dock configurations and not proposed dock "A-E designations in Figure 4.

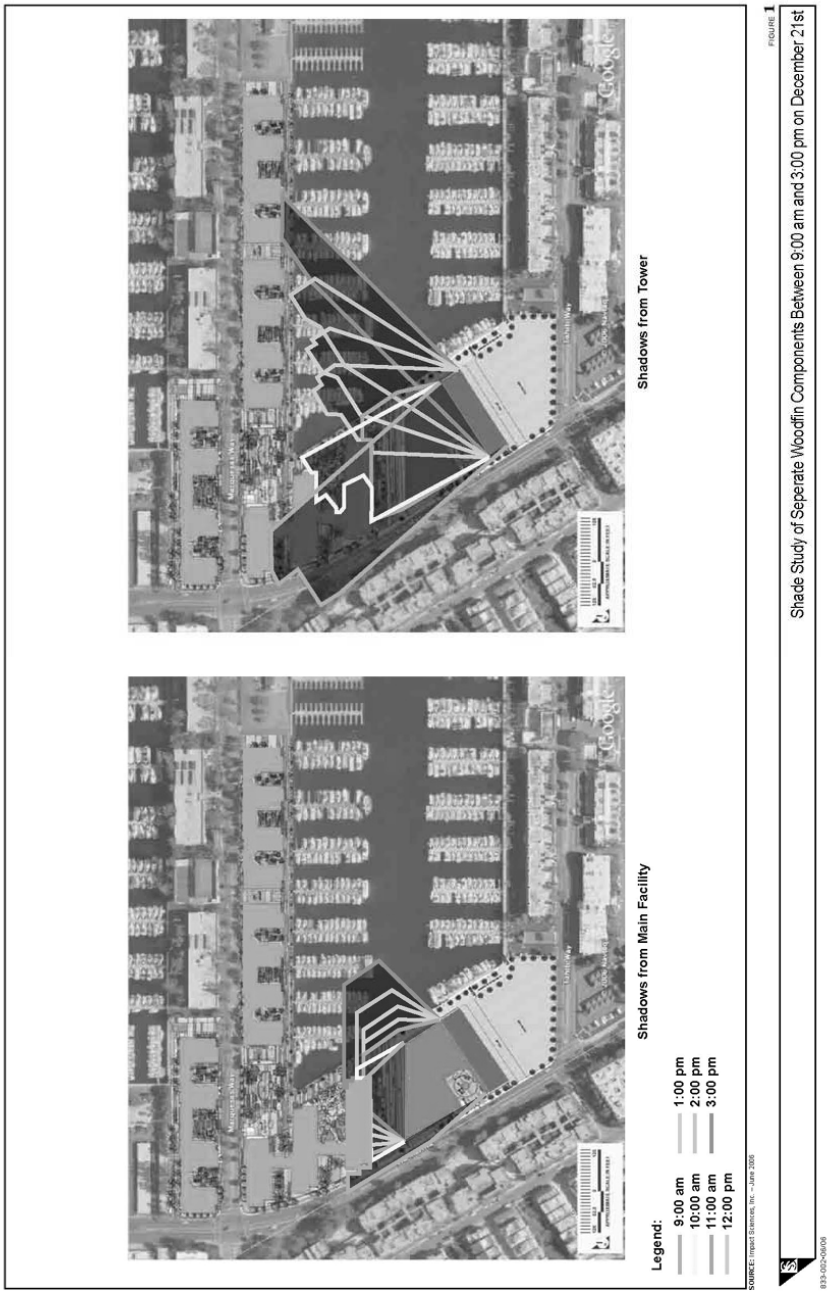

Figure 11. Woodfin Shading Study

At 10:00 am, shadows from the Main Facility or Tower would not fall on Via Marina and would not extend to the Marina waters. By 11 am, the shading from the Woodfin Tower overlap with the shadows from the Main Tower and shade a minimal extent of Basin B at the northwest section (New "A" Dock). By noon, portions of the nearest first two anchorages (New "B" and "C" Dock) would be shaded. At 1 pm, shading would affect would affect small portions of the first boat anchorage (New "B" Dock), and would almost entirely shade the second boat anchorage (New "C" Dock) and affect a small part of the third anchorage (New "D" Dock).

By 2 pm, shadows cast by the Woodfin Tower would extend to the north, covering a larger part of the central navigation channel of Basin B. The first boat anchorage (new "B" Dock) would not be affected. However, shadows would shorten over the second anchorage (new "C" Dock") but cover larger portions of the third and fourth anchorage (new "D and E" docks). By 3 pm, shadows cast by the Woodfin Tower would cover the majority of the fourth anchorage (new "E" Dock) and northernmost half of the fifth (new "F" Dock). The maximum shadow length is at 3 pm, extending about 640 ft to new "F' Dock.

In summary, as the sun angle shifts westward over the Woodfin Tower through the afternoon, shadows on the new "A" and "B" dock diminish and shadows shift into the channel and "C" to "F" docks. By 3 pm. the length of the shadows increase and impinge as far as "F" dock (about 640 ft), but shadows diminish between the seawall through the new "D" Dock.

3.3.5 Potential Biological Effects Related to Landside Shading Sources

Parcel 10R and FF Shading Effects on Marine Habitat

- Shading from landside apartment developments on Parcel 10R and FF will result in a temporary, minor adverse mid-afternoon shading of plants and invertebrates within portions of Basin B and Basin C. However, because the project's shading effect is confined to a few hours each afternoon during the lowest period of plankton production (winter) and only a minimal area of open water, bulkhead, rip rap, and piling habitat of Basin B Marina del Rey Harbor will be affected, the temporary, minor adverse effect of landside structure-related shading on biological productivity is not considered a significant biological impact.

- Seagrass (eelgrass or ditchgrass) does not grow within Basin B or Basin C and will not be affected by any shading effects from the proposed Parcel 10R and Parcel FF development.

- No listed species of wildlife would be affected by shading effects associated with the proposed Parcel 10R and Parcel FF landside development.

Parcel 9U Shading Effects on Marine Habitat

- Shading from Parcel 9U landside development on marine habitat will be most pronounced during the December winter solstice during the lowest period of biological productivity. Shading of marine habitat from this development is greater than from Parcel FF and Parcel 10R. Shading during spring-through-summer will be minimal, if not non-existent during the most biologically productive periods.

- Over a five-hour period beginning at approximately 10 am, shadows would progressively shift their effect between the edge of Basin B to the central part of the basin and the new "F" Dock area. As the shadow shifts across the basin, there will be a temporary adverse late-morning to mid-afternoon shading of plankton and attached macroalgae, as well as pilling-associated invertebrates and fish.

- Seagrass (eelgrass or ditchgrass) does not grow within Basin B and will not be affected by any shading effects from Parcel 9U buildings. No listed species of wildlife would be affected by shading effects associated with development on Parcel 9U.

- The shading effect is transient for any one area within the shadow zone for a short period each day during the least productive time of year. Therefore, the shading effect of the Parcel 9U landside structures on marine habitat and biological productivity is not considered a significant biological impact.

3.3.6 Mitigation for Potential Biological Impacts Related to Landside Shading from Parcels 10R, FF, and 9U.

No mitigation measures are required.

3.4 In-Water Development-Marina and Public Dock

Neptune Marina. Currently, the existing Neptune Marina on Parcel 10R contains 184 boat slips and 14 "end tie" spaces with parking, landscape and hardscape facilities. As noted, Legacy Partners proposed to demolish the existing Neptune Marina and to subsequently develop a new marina containing 161 boat slips and 13 "end-tie" spaces and associated land- and water-side boater-serving facilities on Parcel 10R.

In addition, Legacy Partners proposes to develop a public-accessible transient boat dock and vessel pump-out facility adjacent to the Parcel 9U bulkhead (See Figures 3, 4, and 10). The public facility is being developed by Legacy as compensatory mitigation for Legacy developing nearby Open Space-designated Parcel FF with residential use. The public anchorage, along with Legacy's 50%

funding of the development of a wetland park on the southerly portion of Parcel 9, is proposed as an offset to the loss of Open Space zoning at Parcel FF that will occur when Legacy builds an apartment building on Parcel FF.

Public Dock Facility. The public dock facility will be located seaward of Parcel 9U and will be approximately 254 ft-long and between eight and 12 ft wide. The dock will have room for moorage of between 7 and 11 boats (depending on size of boats) plus room for dingys on north end of anchorage. Four vessel pump-out stations and one sewage pump will be located on the dock (Figure 9) The dock will be placed over water depths of approximately -2 ft MLLW on the shallow side to about -10 ft MLLW on the seaward side of the dock.

3.4.1 Effects of Any New Structures Placed in the Water

During construction, small motorized vessels, barges, a crane, and other equipment will be used to remove pilings and docks and subsequently construct the new marina dock system and the public-accessible dock. These materials will be transported by barge to an approved offshore dump site. No dredging will be required for this project. The approximate time for project completion is 7.5 to 9.5 months. Construction of both the private marina and the public dock is anticipated to occur simultaneously.

3.4.2 Potential Short-term Effects on Water Quality and Biology Related to the Demolition and Subsequent Re-construction of the Legacy Marina and the Public Dock

- Sediment resuspension in the immediate demolition and construction zone.
- Release of heavy metals and chlorinated pesticides into the water column.
- Temporary degradation in water quality (decreased dissolved oxygen, higher biological oxygen demand due to the resuspension of fine, organically-enriched sediments), and increased turbidity resulting from pile removal and pile emplacement activity.
- Mortality of benthic invertebrates in the immediate area of piling and algae and invertebrates attached to the pilings and docks during the removal process.
- Movement of fishes out of the immediate demolition and construction zone due to increased turbidity and potential increases of underwater noise.
- Attraction of fishes to the general project vicinity to forage on algae and invertebrates dislodged from the docks and pilings as they are removed; and;

- Temporary reduction of seabird foraging habitat in the immediate demolition and construction area. However, since the majority of least terns (90-95%) forage within one mile of the Venice Beach breeding site in open coastal waters and those that forage within Marina del Rey Harbor concentrate within the Entrance Channel (ACOE 1999), the potential for adverse effects on least tern foraging habitat is minimal. Likewise, brown pelicans may incidentally forage in Basin B, but their primary food source (anchovy) is found more often in waters nearer to the Entrance Channel and in the offshore waters. Therefore, the potential for adverse effects on brown pelican foraging habitat is also minimal.

3.4.3 Mitigation Measures to Reduce Potentially Significant Short-term Water Quality and Biological Impacts Related to the Demolition and Subsequent Re-construction of the Legacy Marina and the Public Dock

- Adhere to State of California Regional Water Quality Control Board Section 401(b) requirements that provide not-to-exceed turbidity limits;

- Implement Best Management Practices to contain and minimize the spread of any turbidity plume resulting from the demolition or installation of piles. Install a floating siltation curtain around the work area. The contractor shall be responsible for deploying and maintaining the silt curtains;

- Reduce and/or prevent the turbulence from crossing the curtains into the navigation channels or other marine areas;

- When removing or installing new pilings, use methods which minimize sediment disturbances;

- Prohibit the discard of construction and trash debris into the waters of Marina del Rey Harbor; and

- Consider temporal mitigation measures to limit the timing of on-water activities to October 1st through March 31st to avoid potential disruption to foraging California least terns. Because Basin B and the back channel area are not a primary least tern foraging area, this mitigation measure may not be necessary.

3.4.4 Long-term Marina Use and Vessel Pump-out Facility Effects on Water Quality and Biological Resources.

The Neptune Marina will consist of a total of 161 boat slips and 13 end ties. Currently, there are 184 boat slips and 14 end ties. Routine marina activities such as boat and dock maintenance and non-routine occurrences of fuel and oil

spills, illegal waste discharges have a potential to degrade water quality and biological productivity in Marina del Rey Harbor.

Illegal waste discharge in the Marina and at the public dock facility operations can contribute to an increase in bacterial contamination, nutrient loading, and turbidity that would affect both water quality and water contact recreation uses of the Harbor. While the elimination of wastes from vessel holding tanks to the Harbor is prohibited, accidental occurrences are more likely. Authorized pump-out stations must be used for waste elimination. The inclusion of additional vessel pump-out facilities on the proposed transient dock will assist in minimizing illegal vessel discharges in Basin B.

3.4.5 Potential Effects of Marina Structures on Biological Resources

- Mortality of benthic invertebrates under the footprint of each new piling.
- Recolonization of algae and invertebrates on newly installed pilings and docks over the course of a few months to several years; and
- Long-term beneficial impact of increased foraging habitat for California least terns and brown pelicans. Since the footprint of the new slips in Basin B will be about 1,200 sq ft less than the current configuration, the productivity of piling plants and invertebrates (the fouling community) is expected decrease slightly or be at most, be roughly equivalent to the current productivity of Basin B.
- No sensitive marine species of plants, invertebrates, or fishes will be affected by the project. The state-and-federally listed endangered seabird *Sterna albifrons browni* (California least tern) nests nearby on Venice Beach during the March-through September breeding season They generally forage in the open water habitat offshore of Marina del Rey, but will occasionally forage in the main channels of Marina del Rey boat harbor. The proposed pump-out and dock facility is located near the terminus of Basin B, out of the main foraging habitat in the open water channels. Therefore, least terns are unlikely to be affected by this project.

3.4.6 Mitigation for Potential Long-term Impacts On Biological Resources Related to the Demolition and Reconstruction of the Marina Slips

No mitigation measures are necessary.

3.4.7 In-Water Structure (Dock) Shading Extent

Neptune Marina. Currently, the eight sets of docks (A-H) and associated vessels in the slips and vessel end-ties shade an approximate area of 2.38 acres of water and bayfloor based upon an analysis of Google Earth aerial

photos (taken November 2005). The proposed set of eight Neptune Marina Docks (A-H) and side ties will shade 2.13 acres of water and bayfloor at full marina capacity which is a reduction of water coverage of 0.25 acres (10,195 sq ft).

Public Dock Facility. There are currently no docks at the site of the proposed public dock facility. The proposed public dock facility will shade approximately 0.07 acre (2,920 sq ft) of water column habitat at full vessel capacity, and shading will increase to 0.09 acre (3,920 sq ft).

3.4.8 In-Water Structure (Dock) Shading Effects on Biological Resources

- The construction of the new private marina on Parcel 10R will result in a combined beneficial increase of 0.25 acres of unshaded open water habitat because of the decrease in dock and vessel surface area compared to existing conditions.

- A beneficial increase of plankton productivity in Basin B is anticipated because of more unshaded open water habitat associated with the new marina.

- The proposed public boat dock facility at full vessel capacity will decrease the amount of unshaded habitat at the west end of Basin B. Plankton will be insignificantly affected due to their movement with the currents from underneath dock structures. The decreased light levels will not substantially reduce macro-algal productivity since this area supports minimal algal growth on the seawall and piles. No eelgrass occurs within the project area which precludes impacts to this sensitive species.

- While the construction of the proposed public boat dock facility results is a site-specific sq ft reduction of 0.09 acre of unshaded habitat, the reduction is offset by the gain in unshaded open water habitat within the proposed Neptune Marina at Parcel 10R and there is an overall beneficial net gain of 0.16 acre of unshaded water column and benthic habitat taking into account all water-related development.

- Overall, biological productivity in Basin B is expected to increase due to the additional amount of unshaded water column habitat that will be available.

3.4.9 Mitigation for Shading Effects on Biological Resources

- No mitigation is required; there is a net gain of unshaded habitat.

3.4.10 Potential Long-term Effects On Biological Resources Related to the Vessel Pump-out Facilities

- A beneficial effect of the installation of the vessel pump-out facilities on the transient boat dock is a decrease in the number of illegal vessel discharges and an improvement of water quality in Basin B related to a reduction in bacteria and virus concentrations.

- However, poorly maintained pump-out facilities can contribute to serious health hazards by releasing both pathogenic bacteria and viruses to the marine environment and increasing turbidity and nutrient levels that could potentially lead to plankton or bacteria blooms, and bioaccumulation of pathogens in filter feeding clams and mussels. Poorly maintained pump-out facilities could increase the exposure of humans to pathogens through direct water contact activities or through consumption of locally collected shellfish; and

- Water quality and sediment quality degradation as a result of increased organic loads would contribute to an altered and less diverse infaunal community.

3.4.11 Mitigation Measures to Reduce The Potential of Adverse Effects From Long-term Marina Operation and Vessel Pump-out Facilities.

Best Management Practices for marina operation and management should be implemented to reduce the potential for water quality and benthic habitat degradation in Basin B. These include, but are not limited to:

- The applicant should provide each Neptune Marina boat tenant with a copy of all applicable regulations regarding vessel discharges of wastes, antifouling paint use, and refuse management (including handling of hazardous wastes) as part of the lease materials;

- The project applicant shall provide each marina tenant with information regarding procedures for notifying appropriate authorities regarding spills of hazardous materials, containment measures, and applicable penalties for violations as a part of lease materials;

- The applicant shall provide regular cleaning of the marina dock facilities and vacuum sweeping of the parking lots;

- For the public pump out facility, install adequate signs to identify the station, its location and hours of operation;

- Provide the service at convenient times and at a reasonable cost;

- Make the pump out station user friendly;
- Develop and adhere to a regular inspection and maintenance schedule for the pump out station;
- Provide educational information about the pump out station to boaters;
- Enforce existing local, state and federal regulations pertaining to Marine Sanitation Devices and the illegal discharge of boat sewage; and
- Post and make available to boaters a list of other local pump out locations.

Clean Marinas California Program (2006) has developed a guidebook for to making marinas environmentally clean facilities and to help protect the state's waterways from pollution. This guidebook is available at http://cleanmarinascalifornia.org. It is recommended that a copy of this document be kept onsite in the Neptune Marina Office.

If these BMPs are implemented, then potential impacts to biological resources and human health will be mitigated to less-than-significant.

3.4.12 Permitting Process BMPs

The following BMP recommendations are provided to assist in the permitting and environmental assessment process.

- Prepare detailed project descriptions and schedules that identify each type of marina-oriented improvement.;
- Initiate resource agency meetings early in the process to determine agency concerns and data gaps;
- If necessary, develop a detailed sample and analysis plan for additional biological and water quality studies if they are deemed important. At this time, no sampling is recommended because Basin B water quality, sediment quality, and biological resources are adequately being inventoried through the County of Los Angeles marine biological sampling programs in Marina del Rey. Since no monitoring information has ever been collected in Basin C, water quality and sediment quality studies may be deemed necessary by the resource and regulatory agencies; and
- If additional studies are contemplated, obtain agency review and approval early in the permitting process.

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PRE-CONSTRUCTION EELGRASS (ZOSTERA MARINA) SURVEY REPORT AND IMPACT ANALYSIS NEPTUNE MARINA PUMP-OUT AND BOAT DOCK MITGATION AREA MARINA DEL REY, LOS ANGELES, CALIFORNIA

October 11, 2006 SURVEY

Army Corps File No. 2006-01-088
CCC Permit No 05-06-160
RWQCB File Number 06-081

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PRE-CONSTRUCTION EELGRASS (*ZOSTERA MARINA*) HABITAT SURVEYS AND IMPACT ASSESSMENT NEPTUNE MARINA PROJECT

1.0 INTRODUCTION

1.1 PROJECT PURPOSE

Coastal Resources Management, Inc. (CRM) conducted a pre-construction marine biological resources survey in Marina del Rey, Los Angeles, California on October 11th, 2006. The purposes of the investigation were to (1) if eelgrass (*Zostera marina*) and the invasive algae *Caulerpa taxifolia* were present in the vicinity of a proposed boat pump-out station and boat dock mitigation area to be constructed as part of the overall Neptune Marina Project and (2) assess the potential environmental effects of construction and long-term operation of the facilities on these two species.

Project Background and Location

Marina del Rey is located in Santa Monica Bay, California, south of Venice and north of Playa del Rey (Figure 1). It is approximately 24 kilometers (14.9 mi) southwest of downtown Los Angeles. Constructed in 1960 from part of the Ballona Wetlands and the former Lake Los Angeles, Marina del Rey encompasses approximately 354 acres and has a capacity to accommodate more than 6,000 private watercraft. The marina is protected at its entrance by two jetties and a detached breakwall, and is adjacent to the downcoast Ballona Creek Flood Control l Channel. Marina del Rey is divided into eight basins, A through H.

The project area is shown in Figures 2 and 3. The marine biological survey focused on the location of the proposed site of a proposed vessel pump-out stations and additional boat docks/slips at the land-side end of Basin B associated with the construction of the Neptune Marina and Hotel Facilities. Coastal Resources Management previously assessed the impacts of the proposed project on marine resources in the vicinity of the proposed project (Coastal Resources Management (2000). The applicant is requesting a Coastal Development Permit to authorize the demolition of all site improvements on County Parcel 10R, which include 136 existing apartment units; a marina containing 184 boat slips and 14 “end-tie” spaces; and appurtenant parking, landscape and hardscape facilities. Applicant requests authorization for the subsequent construction, use and maintenance of the following on Parcel 10R: 400 rental dwelling units in three (3) apartment buildings (4 residential floors over 2 levels of at-grade and partially subterranean structured parking containing at least 909 parking spaces for apartment residents, their guests and boat slip tenants, per Code) with private courtyard and outdoor recreation (pool) areas; a 28 ft.-wide public Waterfront Stroll Promenade along the entire waterfront extent of the parcel; appurtenant common landscaped and hardscaped facilities; and a marina containing 161 boat slips and 13 end-tie spaces, with contemporary, appurtenant landside (boaters’ restrooms, lounge and parking) and waterside (dock-side utilities and a bilge/sewage pump-out station) facilities.

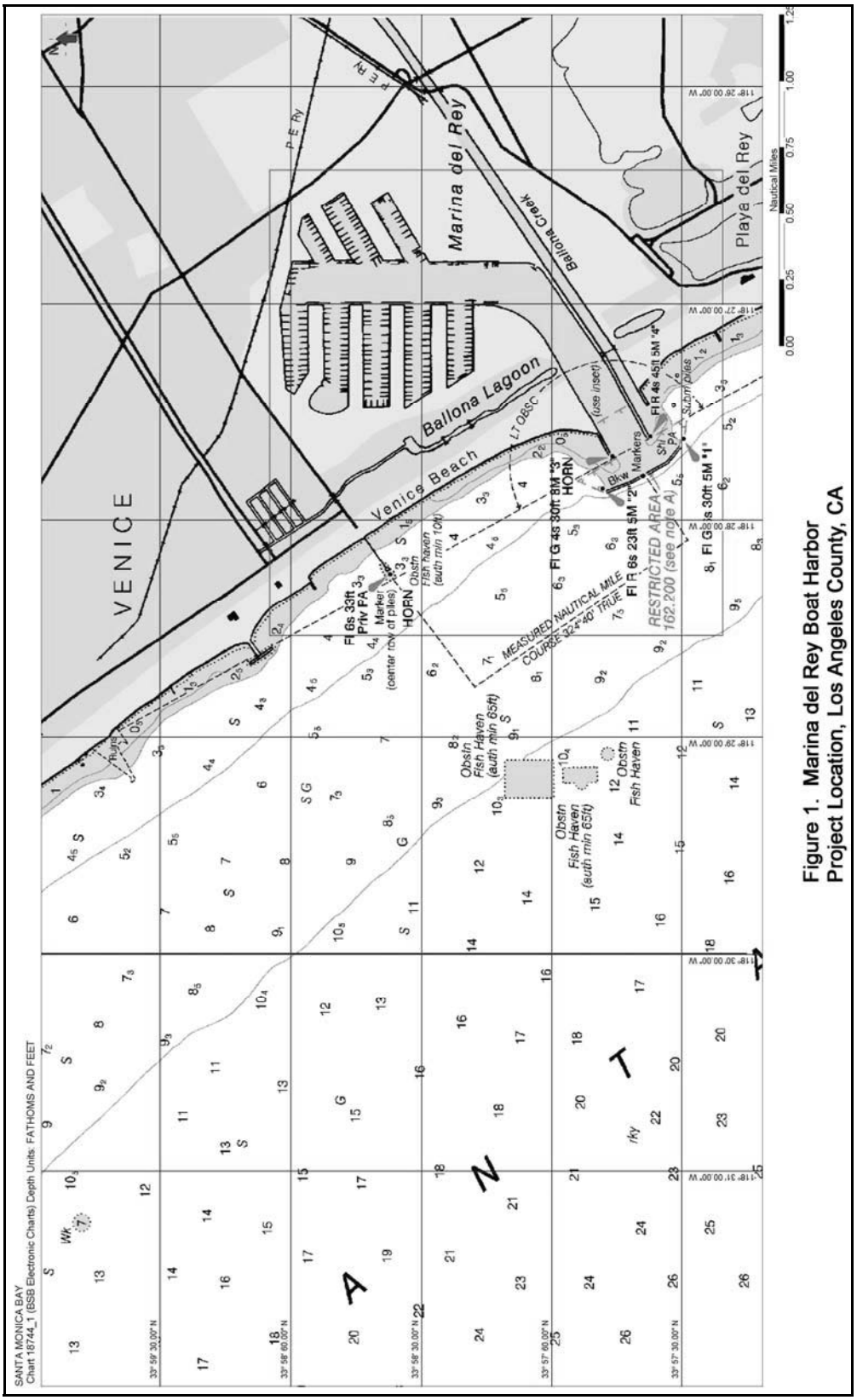

Figure 1. Marina del Rey Boat Harbor Project Location, Los Angeles County, CA

Figure 2. Basin B Pump-Out Station and Boat Dock Mitigation Site

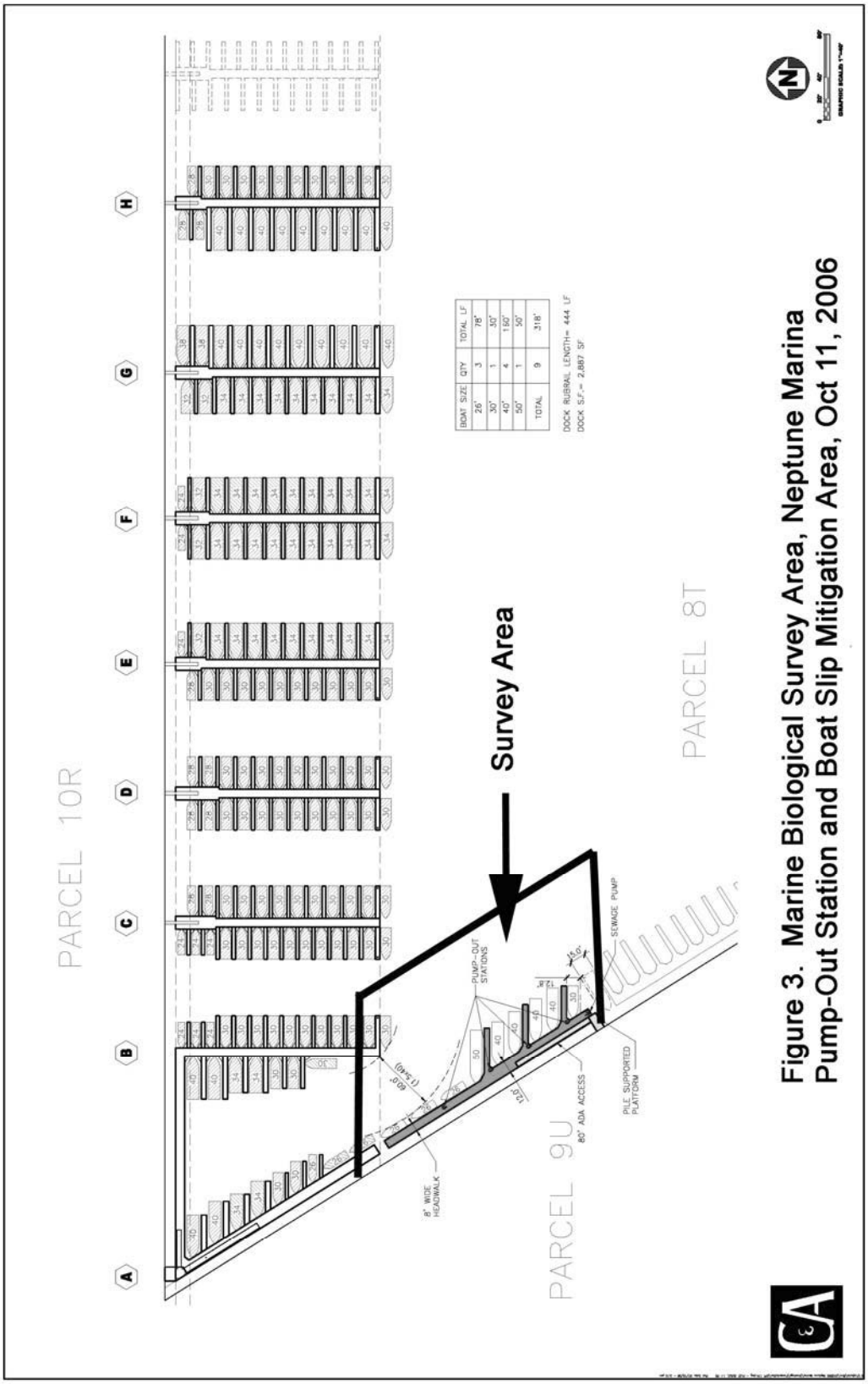

Figure 3. Marine Biological Survey Area, Neptune Marina Pump-Out Station and Boat Slip Mitigation Area, Oct 11, 2006

Under the Coastal Development Permit request, the applicant also requests authorization to demolish all site improvements located on Parcel FF (a surface parking lot containing 206 parking spaces and appurtenant landscaping), and to subsequently construct: one (1) apartment building containing 126 rental dwelling units (4 residential floors over 2 levels of at-grade and partially subterranean structured parking containing 242 parking spaces for apartment residents and their guests, per Code) with private courtyard areas; a 28 ft.-wide public Waterfront Stroll Promenade along the entire waterfront extent of the parcel; and appurtenant common landscaped and hardscaped facilities.

The applicant's combined proposed development of Parcels 10R & FF will, therefore, result in construction of 526 apartment dwelling units (a net gain of 390 dwelling units).

Woodfin Suite Hotels, LLC, proposes a separate development on adjacent Parcel 9U to the south of Parcel 10R, as follows: The applicant is requesting a Coastal Development Permit per LACC 22.56.2280 to authorize the construction of a 20story (225-feet-tall, exclusive of screened rooftop mechanical equipment, helipad and elevator machine room), 288-room hotel and vacation ownership resort structure (up to 152 conventional hotel suites and 136 vacation ownership/"timeshare" suites) with the following accessory uses in conjunction with the primary hotel/vacation ownership use: Restaurant with interior and outdoor/terrace dining areas and kitchen; cocktail lounge; gift shop (not to exceed 1,000 sq. ft.); banquet room and kitchen; meeting rooms; pre-function areas; resort pool and spa; and resort administrative offices and "back of house" areas (e.g., laundry and storage, etc.). The project includes a six-level parking garage adjoining the hotel/vacation ownership structure to the north (5 parking levels above ground and 1 parking level underground), designed to accommodate up to 398 valet-only parking spaces. The Project also includes construction of a 28-foot-wide public pedestrian promenade along the parcel's entire water frontage. Subject to County and/or Coastal Commission approval of land use applications filed separately from this application, another company (Legacy Partners Residential, Inc.) will be seeking authorization to develop an approximately 1.47-acre public wetland park over the southerly portion of the subject Parcel 9U and to also develop approximately XX public transient boat slips adjacent to the Parcel 9U bulkhead.

This additional marine resources project impact assessment is specific to the addition of the proposed vessel pump-out facilities and additional boat slips at the western end of Basin B. The project boundaries of the survey are shown in Figure 2 and Figure 3.

1.2 IMPORTANCE OF EELGRASS

Eelgrass (Figure 4) is a marine flowering plant that grows in soft sediments in coastal bays and estuaries, and occasionally offshore to depths of 50 feet (ft). Eelgrass canopy (consisting of shoots and leaves added vegetation and the vertical relief it provides enhances the abundance and the diversity approximately two to three ft long attracts many marine invertebrates and fishes and the of the marine life compared to areas where the sediments are barren. A diverse community of bottom-dwelling invertebrates (i.e., clams, crabs, and worms) live on eelgrass or within the soft sediments that cover the root and rhizome mass

system. MBC Applied Environmental Sciences (1986) identified a total of 97 species of invertebrates associated with Sunset Bay, Huntington Harbour, and Mission Bay eelgrass blades and shoots. Another 216 taxa were found living among the roots and sediment. The vegetation also serves a nursery function for many juvenile fishes, including species of commercial and/or sports fish value (California halibut and barred sand bass). Eelgrass meadows are critical foraging centers for seabirds (such as the endangered California least tern) that seek out baitfish (i.e., juvenile topsmelt) attracted to the eelgrass cover. Lastly, eelgrass is an important contributor to the detrital (decaying organic) food web of bays as the decaying plant material is consumed by many benthic invertebrates (such as polychaete worms) and reduced to primary nutrients by bacteria.

Because of the high ecological value of eelgrass meadows, it is important to document the location and amount of eelgrass in areas of proposed waterside developments and to mitigate any losses by avoiding or reducing, or compensating for any adverse effects on eelgrass habitats and communities.

1.3 STATUS OF EELGRASS WITHIN MARINA DEL REY

To date, no records of eelgrass (*Zostera marina*), the common seagrass of southern California are known from Marina del Rey. However, ditchgrass (*Ruppia maritima*) occurs within Basin D (Mother's Beach), and has occurred irregularly since 1979 (Soule and Oguri 1993; Soule et al. 1997). This is an uncommon seagrass species found in quiet water habitats that is an important habitat for larval and adult fish. Coastal Resources Management, Inc conducted site-specific eelgrass surveys in Marine del Rey in May 2006 at 22 sites throughout the harbor for the County of Los Angeles Phase 1 Seawall Repair Project (CRM 2006). No eelgrass was located at any of the 22 sites.

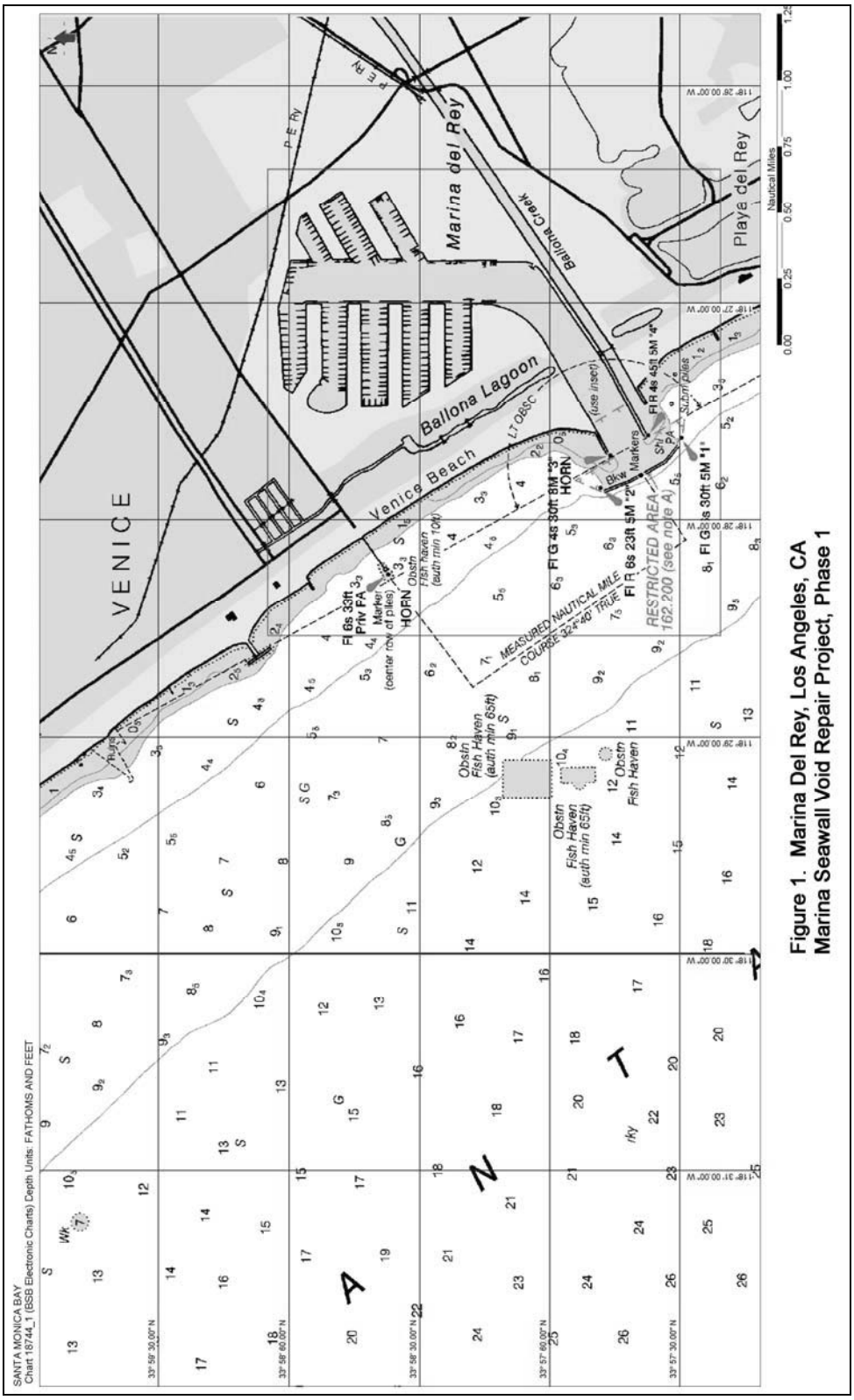

Figure 1. Marina Del Rey, Los Angeles, CA
Marina Seawall Void Repair Project, Phase 1

Figure 2. Eelgrass, *Zostera marina*. One "shoot" and the cluster of "blades" arising from the shoot is considered a "turion unit".

2.0 FIELD SURVEY METHODS

Eelgrass and *Caulerpa* surveys were conducted by CRM biologists Rick Ware and Lein Jenkins on October 11th, 2006 between 0800 and 1000 hrs. Surveys were conducted from a 14 foot inflatable vessel.

Underwater surveys were conducted within the Basin B project location using using SCUBA. Surface support personnel were in communication with the diving-biologist using an Offshore Technology Systems, Inc. underwater communication system.

A total of thirty-one 98.8 foot (30 meter)- long transects were swam perpendicular to the seawall at 10 ft (3 m) intervals. Bottom type, common marine life, and the presence or absence of eelgrass and invasive algae were recorded. Depths were standardized to Mean Lower Low Water (MLLW) based upon time of observation and tidal corrections for the Santa Monica Pier tidal survey station.

Invasive Algae. The project area bayfloor was also surveyed for the presence of the invasive algae (*Caulerpa taxifolia*). A separate project report was prepared for this species and is included in Appendix A of this report.

3.0 PRE-CONSTRUCTION SURVEY RESULTS

The area within the marine biological project limits encompassed a total of 29,052 sq ft (2,700 sq meters). Based upon underwater visibility conditions that averaged 6 ft (3 ft on each side of the center line the diver followed), the actual amount of bayfloor observed by the biologists was 18,302 sq ft (1,701 sq m). This accounted for 63% of the total bayfloor habitat within the project limits.

3.1 PHYSICAL ENVIRONMENT

The survey was conducted at depths between the top of the rip rap along the seawall (approximately +3 ft MLLW) and a maximum of 11 ft MLLW at 30 meters from the bulkhead. Substrate types within the survey area included cement seawall, rock rip rap, and unconsolidated sand-to-silty sediments beyond the rip rap. Underwater visibility was fair and averaged 3 ft on each side of the transect center line. Water temperature was 66 degrees Fahrenheit. Tidal currents were minimal during the survey.

3.2 EELGRASS

Eelgrass was not present in the project area. The only location where seagrass has been reported in past Marina del Rey surveys is in Basin D at "Baby Beach", where ditchgrass (*Ruppia maritima*) is reported to occur.

3.3 OTHER MARINE FLORA AND FAUNA

A red-algal turf, consisting of *Polysiphonia* sp. and *Chondracanthus spinosus* was observed on the rip rap. The brown algae *Sargassum muticum and Dictyota binghamiae* were also observed on the rip rap, with *Sargassum* being the most abundant brown algae.

Invertebrates and fishes observed by biologists included sponges (*Haliclona* sp.) unid hydroids, burrowing anemones (*Pachycerianthus fimbriatus*), limpets (*Collisella limatula*), mussels (*Mytilus galloprovincialis*), oysters (*Ostrea conchilcola*), ectoprocts (*Bugula californica,* orange bryozoan, unid.), tunicates (*Botryllus/Botrylloides* complex, *Styela montereyensis, Styela plicata,* Ascideacea, unid), topsmelt (*Atherinops affinis*), opaleye perch (*Girella nigricans*), unid perch (Embiocidae, unid.), barred sand bass (P*aralabrax nebulifer),* unidentified turbot (*Pleuronichthys* sp.), and round sting ray (*Urolophus halleri*).

Of the invertebrates observed, the most common types occurring on the rip rap throughout the marina included hydroids, ectoprocts and tunicates.

3.4 *CAULERPA TAXIFOLIA*

No invasive algae was located in the project area. The invasive algae reporting form, submitted to the National Marine Fisheries Service and the California Department of Fish and Game is provided in Appendix A.

4.0 IMPACT ASSESSMENT

4.1 PROPOSED PROJECT ELEMENTS

The proposed project includes the construction and operation of three vessel pump out facilities and a boat dock (Figure 3). The dock will be accessed via a pile-supported platform and ADA accessible ramp. The headwalk of the dock will be 8 to 12 ft wide. Three fingers will be constructed to accommodate a total of six, 30 to 40 ft-long vessels. Other vessels will be able to side-tie to the head walk. The pump-out stations will be located at the base of each of the three dock fingers. Each of the pump-out stations will be tied into a sewage pump located at the south end of the dock system.

4.2 PROPOSED CONSTRUCTION METHODS

4.3 IMPACTS ON WATER QUALITY AND EELGRASS BED RESOURCES

Water Quality

Potential water quality impacts during the seawall void repair project include project area wash downs, accidental spills, and disposing of debris in the water. Environmental impact avoidance/mitigation is built into construction methods. Silt fences and debris booms will be installed around each repair location to prevent suspended sediments and floating debris from leaving each repair location. The filter fabric and rock will cover the void openings and prevent the grout from being released into marina waters. On the landside, straw waddles will be placed around each work area to prevent rain from washing the grout materials into the storm drains or into the marina. The storm drains will all be surrounded by waddles, and covered with fabric to prevent accidental discharge.

With the inclusion of the above-listed avoidance/mitigation measures, there will be no adverse environmental impacts on water quality.

Eelgrass

There is no eelgrass within the 26 project sites. The proposed project will have no short-term or long-term adverse effects on eelgrass bed resources.

5.0 BEST MANAGEMENT PRACTICES

5.1 WATER QUALITY

See Section 4.3 for a discussion of BMPs and mitigation measures that have been designed into project construction methods.

5.2 EELGRASS

Eelgrass does not occur within the project area. No BMPs or mitigation measures required.

6.0 LITERATURE CITED

Coastal Resources Management 2006a. Marina del Rey seawall void repair project, Phase 1 repairs. Marina del Rey, California. Survey date: May 10-11, 2006. Prepared for Los Angeles County Department of Public Works. 10 pp.

MBC Applied Environmental Sciences. 1986. *Infauna and epibiota associated with transplants of eelgrass (Zostera marina) in southern California.* Prepared for Maguire Thomas Partners, The Huntington Partnership, National Marine Fisheries Service, and U.S. Fish and Wildlife Service. 48 pp.

National Marine Fisheries Service. 1991 (as amended). *Southern California eelgrass mitigation policy*. 4 pp. Revision 11 (draft), 30 August, 2005.

Soule, D.F. and M. Oguri (1993). *The marine environment of Marina del Rey, 1987-1991*. Annual reports to Los Angeles County Department of Beaches and Harbors. Harbors Environmental Projects, University of Southern California. Part 20D, 166 pp., plus appendices.

Soule, D.F., M. Oguri, and R.E. Pieper (1997) *The marine environment of Marina del Rey, July 1995-June 1996.* A report to the Los Angeles County Department of Beaches and Harbors. Harbors Environmental Projects, University of Southern California. March 1997. 1 volume including appendices.

Caulerpa taxifolia Survey Reporting Form

Neptune Marina Public Dock and Vessel Pump-out Facilities,
Parcel 9U Basin B
Marina del Rey Boat Harbor
Los Angeles County, California
Survey Date: October 17th, 2006

Prepared by:
Coastal Resources Management, Inc.
PMB 327, 3334 East Coast Highway
Corona del Mar, CA 92625
Contact: Rick Ware, Senior Marine Biologist
(949) 412-9446

Prepared for:

Legacy Partners Residential, Inc.
5141 California Avenue Suite 100 Irvine California 92617
Contact: John Santry
949 930-7746

This form is required to be submitted for any surveys conducted for the invasive exotic alga *Caulerpa taxifolia* that are required to be conducted under federal or state permits and authorizations issued by the U.S. Army Corps of Engineers or Regional Water Quality Control Boards (Regions 8 & 9). The form has been designed to assist in controlling the costs of reporting while ensuring that the required information necessary to identify and control any potential impacts of the authorized actions on the spread of *Caulerpa*. Surveys required to be conducted for this species are subject to modification through publication of revisions to the *Caulerpa* survey policy. It is incumbent upon the authorized permittee to ensure that survey work is following the latest protocols. For further information on these protocols, please contact: Robert Hoffman, National Marine Fisheries Service (NOAA Fisheries), (562) 980-4043, or William Paznokas, California Department of Fish & Game, (858) 467-4218).

Report Date:	October 27, 2006
Name of bay, estuary, lagoon, or harbor:	Marina Del Rey, Los Angeles, California. See Figure 1.
Specific Location Name:	West Bulkhead, Parcel 9U, Basin B
Site Coordinates: (UTM, Lat./Long., datum, accuracy level, and an electronic survey area map or hard copy of the map **must** be included).	Center of Proposed Dock System: 33° 58.507' N; 118° 27.420' W Accuracy: 1 m, WGS 84 See Figure 2 and 3 for the project location
Survey Contact: (name, phone, e-mail)	Rick Ware, Senior Marine Biologist, Coastal Resources Management, Inc. (949) 412-9446, rware.crm@earthlink.net John Santry, Legacy Partners Residential, inc. Project Manager (949) 930-7746 JSantry@LegacyPartners.com
Personnel Conducting Survey (if other than above): name, phone, email	Mr. Rick Ware and Mr. Lein Jenkins, of Coastal Resources Management, Inc.
Permit Reference: (ACOE Permit No., RWQCB Order or Cert. No.)	RWQCB File No. Pending CCC File No. Pending Army Corps File No. Pending
Is this the first or second survey for this project?	First survey

Was *Caulerpa* Detected?: (if *Caulerpa* is found, please immediately contact NOAA Fisheries or CDFG personnel identified above)	_____Yes, *Caulerpa* was found at this site and _____has been contacted on _____ date. _____**X X**_____**No, *Caulerpa* was not found at this site.**

Description of Permitted Work: (describe briefly the work to be conducted at the site under the permits identified above)	Construction and operation of three vessel pump out facilities and a boat dock (Figure 3). The dock will be accessed via a pile-supported platform and ADA accessible ramp. The headwalk of the dock will be 8 to 12 ft wide. Three fingers will be constructed to accommodate a total of six, 30 to 40 ft-long vessels. Other vessels will be able to side-tie to the head walk. The pump-out stations will be located at the base of each of the three dock fingers. Each of the pump-out stations will be tied into a sewage pump located at the south end of the dock system.	
Description of Site:	*Depth range:*	-1 ft to -11 ft MLLW.
(describe the physical and biological conditions within the survey area at the time of the survey and provide insight into variability, if known. Please provide units for all numerical information).	*Substrate type:*	Rip rap extended between the intertidal zone to a depth of approximately -6 ft MLLW: sand and silty sediments were present between depth of -6 and -11 ft MLLW.
	Temperature:	66 degrees F
	Salinity:	25-35 ppt
	Dominant flora:	The brown algae *Sargassum muticum and Dictyota binghamiae;* and red turf algae.
Site Description (continued)	*Dominant fauna:*	Invertebrates and fishes observed by biologists included sponges (*Haliclona* sp.) unid hydroids, burrowing anemones (*Pachycerianthus fimbriatus*), limpets (*Collisella limatula*), mussels (*Mytilus galloprovincialis*), oysters (*Ostrea conchilcola*), ectoprocts (*Bugula californica*, orange bryozoan, unid.), tunicates (*Botryllus/Botrylloides* complex, *Styela montereyensis*, *Styela plicata*, Ascideacea, unid), topsmelt (*Atherinops affinis*), opaleye perch (*Girella nigricans*), unid. perch (Embiocidae, unid.), barred sand bass (P*aralabrax nebulifer)*, unidentified turbot (*Pleuronichthys* sp.), and round sting ray (*Urolophus halleri*).

	Exotic species encountered (including any other Caulerpa species):	None
	Other site description notes:	None
Description of Survey Effort:	*Survey date and time period:*	October 17th, 2006, 0800-1000 hrs
Description of Survey Effort: (continued) please describe the surveys conducted including type of survey (SCUBA, remote video, etc.) and survey methods employed, date of work, and survey density (estimated percentage of the bottom actually viewed.	*Horizontal visibility in water:*	1 meter (3 ft) on each side of centerline of each transect; total viewing area along each transect: 2 meters (6 ft) on all transects
	Survey type and methods:	The underwater survey was conducted using SCUBA. A total of thirty one, 30 meter long (98.8 ft) transects were swam perpendicular to the seawall 3 meters (10 ft) apart in front of Parcel 9U. Transect visual width was 6 ft (2 m). Bottom type, common marine life, and the presence or absence of *Caulerpa taxifolia* and *Zostera marina* was noted. Depths were standardized to Mean Lower Low Water (MLLW) based upon time of observation and tidal corrections for the Santa Monica Pier tidal survey station.
Describe any limitations encountered during the survey efforts.	*Survey personnel:*	Rick Ware and Lein Jenkins of Coastal Resources Management, Inc.
	Survey density:	Thirty-one, 2 meter wide (6 ft) by 30 m (98.8 ft)-long transects perpendicular to the bulkhead. The total Area of Potential Effect (APE) was 2,700 sq meters (29,052 sq ft). Based upon underwater visibility conditions that averaged 2 meters (1 meter on each side of the center line the diver followed), the actual amount of bayfloor observed by the biologists was 1,701 sq m (18,302 sq ft). This accounted for 63% of the total APE bayfloor habitat within the project limits. A minimum of 20% coverage is required for non-infected systems.

	Survey limitations:	No survey limitations
Other Information: (use this space to provide additional information or references to attached maps, reports, etc.)	See attached project maps and tables. **Figure 1**. Project Location, Marina del Rey **Figure 2**. Aerial Photo of Project Area showing areas where transects were swam **Figure 3**. Project Plans	

Caulerpa Survey Reporting Form (version 1.2, 10/31/04)

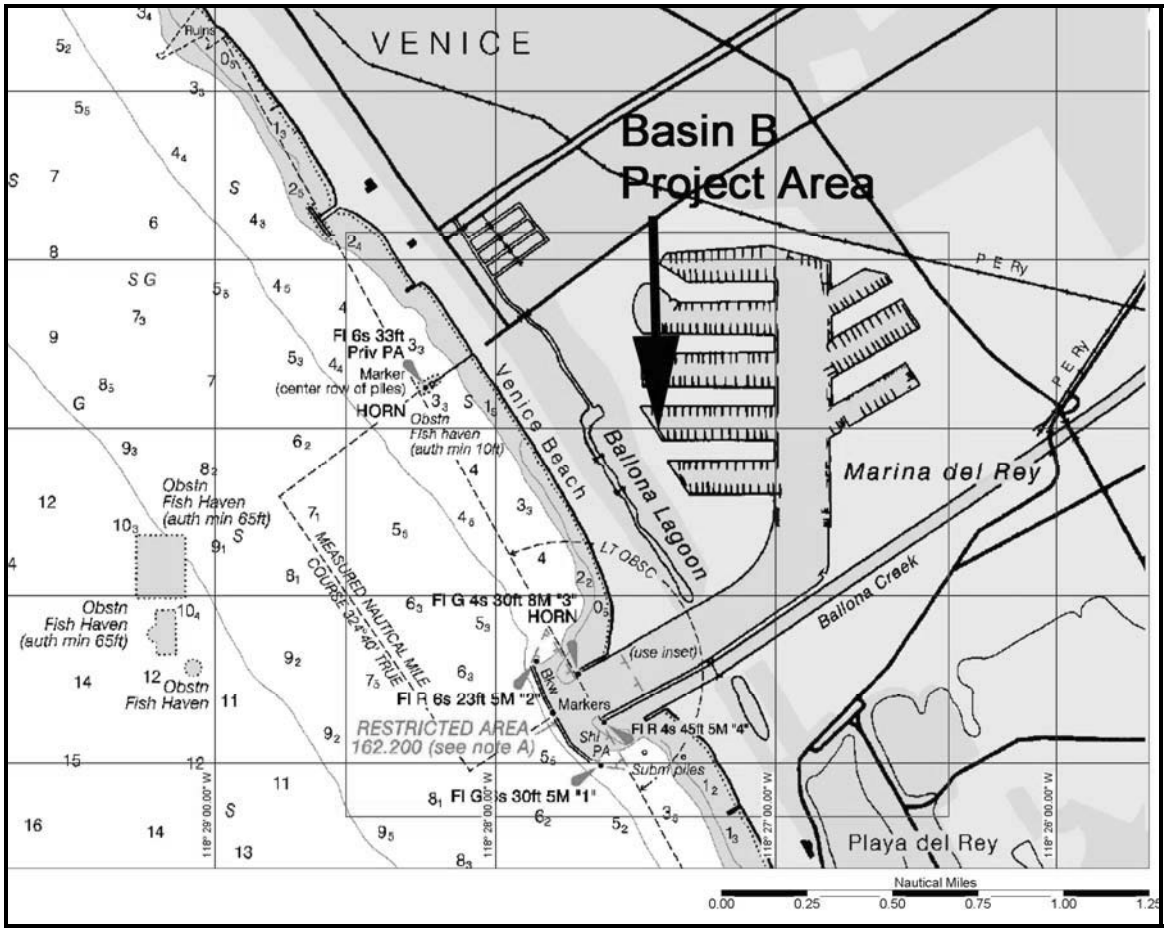

Figure 1. Project Location, Marina del Rey Harbor

Figure 2. Aerial Photograph and Survey Location in Marina Del Rey.
Source: Google Earth

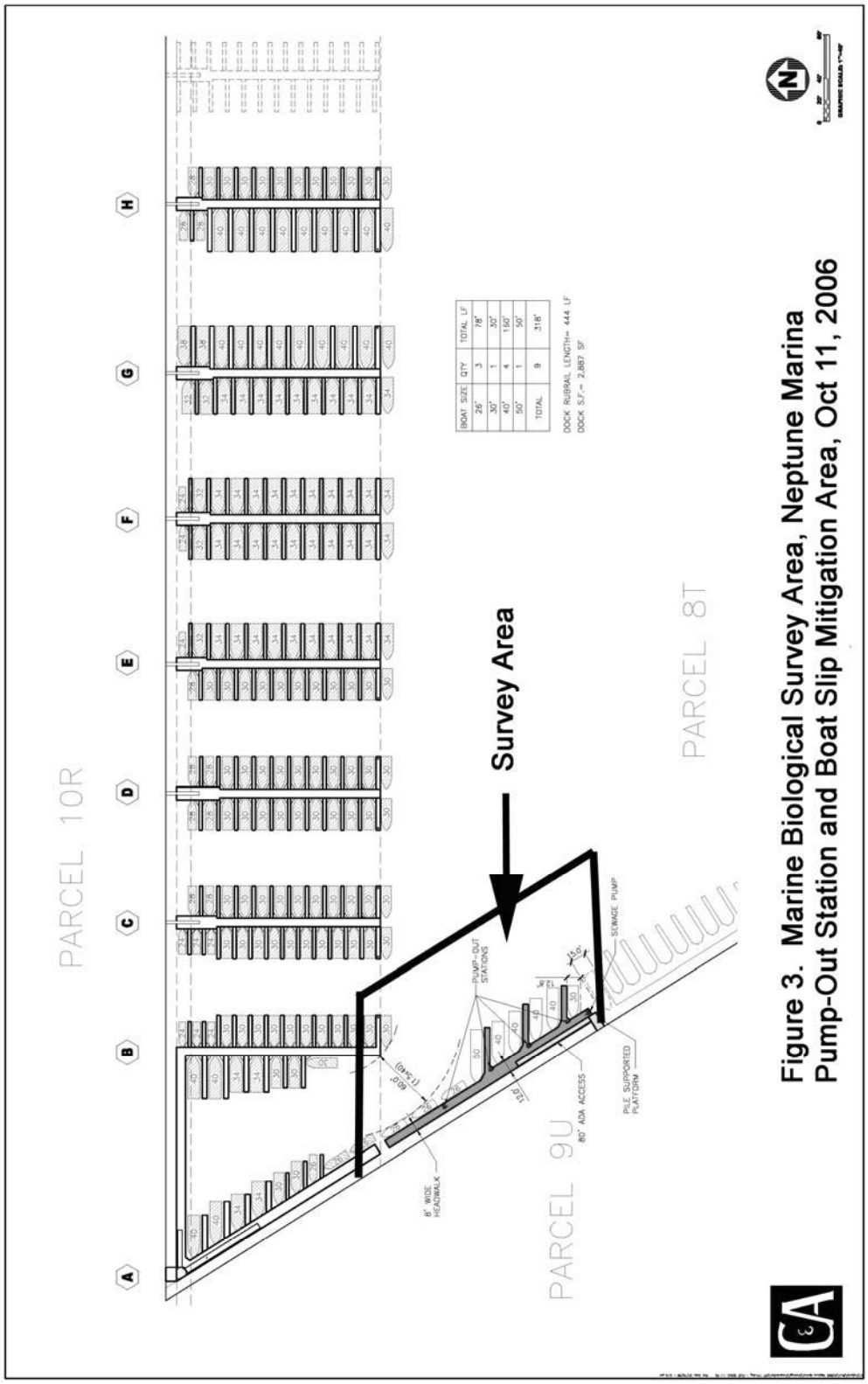

Figure 3. Conceptual Dock Layout and Pump Station Plans
Source: Cash & Associates Engineers

APPENDIX 5.7

Traffic/Access

Crain & Associates Traffic Report (2007)

DRAFT

TRAFFIC ANALYSIS FOR A PROPOSED 526-UNIT RESIDENTIAL DEVELOPMENT, 288-UNIT HOTEL/TIMESHARE RESORT, AND 1.46-ACRE PUBLIC PARK ON PARCELS 10R, FF AND 9U IN MARINA DEL REY

Prepared for:

LEGACY PARTNERS NEPTUNE MARINA, LLC
AND WOODFIN SUITES HOTELS, LLC

Prepared by:

Crain & Associates
2007 Sawtelle Boulevard, Suite 4
Los Angeles, California 90025
(310) 473-6508

December 2007

EXECUTIVE SUMMARY

The project under consideration, known as the "Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project," is being proposed by Legacy Partners Neptune Marina, LLC ("Legacy Partners"), and Woodfin Suite Hotels, LLC ("Woodfin"). The project consists of the following five components: (1) Neptune Marina Parcel 10R; (2) Neptune Marina Parcel FF; (3) the Woodfin Suite Hotel and Timeshare Resort (on northerly portion of Parcel 9U); (4) a wetland restoration project on the southern portion of Parcel 9U; and (5) a public/transient boat anchorage proximal to Parcel 10R and Parcel 9U within Marina del Rey Basin B. The five project components are further described as follows:

Component 1 (being developed by Legacy Partners) includes the landside development of Parcel 10R and waterside development in adjacent Basin B. Parcel 10R is located at the southeasterly corner of the intersection of Marquesas Way and Via Marina, and has frontage on both Via Marina and Marquesas Way. Landside development on Parcel 10R consists principally of the demolition of 136 rental apartments (the "Neptune Marina Apartments," dating from the 1960's) and the subsequent construction of a new apartment complex containing 400 rental apartment units. At least 777 on-site parking spaces will be provided for apartment residents and their guests, consistent with County Code requirements.

The waterside portion of Parcel 10R in Basin B would be comprised of a small craft anchorage consisting of 174 boat spaces that would replace an existing marina containing at least 184 boat spaces, which have deteriorated over time. The reduction in at least 10 boat spaces results from achieving compliance with California Department of Boating & Waterways and Americans with Disabilities Act standards. At least 131 on-site parking spaces will be provided for boat slip tenants, consistent with County Code requirements.

Component 2 (being developed by Legacy Partners) includes the landside redevelopment of Marina Parcel FF. Parcel FF is located at the northeasterly corner of the intersection of Marquesas Way and Via Marina, immediately across Marquesas Way from Parcel 10R. Development on Parcel FF consists principally of the demolition of an existing underutilized public parking lot containing 207 parking spaces, and the subsequent construction of an apartment building containing 126 rental apartment units. At least 242 on-site parking spaces will be provided for apartment residents and their guests, consistent with County Code requirements.

Component 3 (being developed by Woodfin) includes the development of the northerly approximately 2.20 acres of Parcel 9U. Parcel 9U is a vacant lot which abuts Parcel 10R to the south and is situated at the northeasterly corner of the intersection of Tahiti Way and Via Marina. This project component principally consists of the development of a hotel/timeshare resort containing 288 hotel and timeshare suites (a minimum of 152 conventional hotel suites and 136 timeshare suites) and accessory patron- and visitor-serving uses. The proposed hotel/timeshare resort will accommodate approximately 360 parking spaces including 339 "valet-only" spaces and 21 "self-park" spaces, as further outlined in the shared-parking analysis for this project component provided herein.

Component 4 (being developed by Woodfin, with 50 percent of the funding for this component being provided by Legacy Partners) consists of the development of a 1.46-acre restored public wetland and upland park that would be constructed on the southern portion of Parcel 9U.

Component 5 (being developed by Legacy Partners) includes the construction of a public/transient anchorage accommodating berthing space for between seven and 11 public/transient boats (depending on the vessels' relative sizes) and dinghy moorage area. This public anchorage would be situated adjacent to the Parcel 9U bulkhead

within Marina del Rey Basin, adjacent to and southerly of the private anchorage that Legacy Partners is constructing in conjunction with project Component 1, described above. It should be noted that the public/transient boat spaces, by nature, are not expected to generate additional vehicle trips.

As defined, the Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project would therefore principally consist of 526 residential dwelling units, 288 hotel/timeshare suites with an assortment of accessory patron- and visitor-serving uses, 174 private and between seven and 11 public/transient boat spaces and dinghy moorage area and a restored public wetland and upland park area. As there are 136 existing apartments and 198 boat spaces presently on-site, implementation of the proposed project would result in a net increase of 390 apartment units, 288 hotel and timeshare suites with accessory patron- and visitor-serving uses, a net decrease of 24 boat spaces and an increase of between seven and 11 public/transient boat spaces, a 0.47-acre wetland and 0.99-acre public upland buffer area.

Following completion and occupancy, the project could generate a total of approximately 3,104 net new daily trips, including 253 net new trips during the AM peak hour and 228 net new trips during the PM peak hour. This traffic study shows that the proposed land uses could produce significant project traffic impacts prior to mitigation at four nearby intersections: Admiralty Way and Via Marina; Washington Boulevard and Via Marina/Ocean Avenue; Lincoln Boulevard and Mindanao Way; and Admiralty Way and Mindanao Way. Recommended mitigation for these potential impacts is described below.

Upon California Coastal Commission certification of amendments to the Marina del Rey Local Coastal Program proposed by the applicant, the development project would be consistent with the Phase II Marina del Rey Land Use Plan (LUP) development allowances for both Development Zones (DZ2 and DZ3) which it occupies. Further, the

project does not significantly affect the overall Phase II trip cap limits, and will not trigger the need for any system-wide/regional Category 3 roadway improvements prior to its construction.

The specific transportation and circulation improvements identified in the Marina del Rey Specific Plan Transportation Improvement Program (TIP) are designed to fully mitigate the traffic generation of the Phase II development in Marina del Rey. In order to fund the recommended TIP roadway improvements, projects within the Marina, including the proposed project, are required to pay a traffic mitigation fee imposed by the County of Los Angeles pursuant to the TIP. This fee is intended to fund the Category 1 (local Marina) and Category 3 (regional) roadway improvements described in the TIP, by providing "fair share" contributions toward the improvements, based on the amount of project PM peak hour trips.* These improvements address local traffic generated in and confined to the Marina, as well as trips which leave or pass through the Marina (regional trips).

The County's traffic mitigation fee structure is currently $5,690 per PM peak hour trip. Based on the expected project trip generation of 228 net PM peak hour trips, the project would be required to pay $1,297,320 in trip mitigation fees ($716,940 attributable to Legacy Partners and $580,380 attributable to Woodfin). As noted above, a portion of these fees is designated toward the Category 3 (regional) transportation improvements.

The County Department of Public Works has expressed that it prefers to implement the Marina del Rey roadway improvements funded by the trip mitigation fees as a single major project in order to minimize traffic disruptions and construction time. Therefore, payment of the fee described previously is the recommended mitigation over the partial construction by this project of portions of the significant TIP roadway improvements.

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* Category 2 roadway improvements are reserved for Area A, which is DZ 15 and is part of the Playa Vista Development on the Marina.

However, should the County decide that some roadway improvement measures must be implemented earlier to assure that the project's direct significant impacts are reduced to less than significant levels on or before project occupancy, the following measures are recommended:

- Admiralty Way and Via Marina – Widen the south side of Admiralty Way to accommodate a triple westbound left turn movement, and two lanes eastbound on Admiralty Way with a right-turn merge lane from northbound Via Marina. This improvement is identified in the Marina del Rey TIP as a Category 1 improvement, and will enhance traffic flow within the Marina.

- Washington Boulevard and Via Marina/Ocean Avenue – No feasible physical improvements are identified in the TIP that remain available to mitigate this potential direct project traffic impact. However, the County of Los Angeles Department of Public Works has identified an improvement at the nearby intersection of Washington Boulevard and Palawan Way that would provide additional egress from the Marina, reducing traffic volumes on the northbound approach of Via Marina at this intersection, and providing mitigation for the direct project traffic impact. The proposed improvement would reconstruct the intersection of Washington Boulevard and Palawan Way to allow for dual northbound left-turns onto westbound Washington Boulevard, and install a new traffic signal at that intersection. The improvement will provide an additional means of accessing westbound Washington Boulevard from westbound Admiralty Way, reducing the existing high northbound volumes at Washington Boulevard and Via Marina/Ocean Avenue. (See "Washington Boulevard and Palawan Way" below for additional details.)

- Lincoln Boulevard and Mindanao Way – Widen the west side of Lincoln Boulevard both north and south of Mindanao Way, and relocate and narrow

the median island on Lincoln Boulevard to provide a right-turn lane in the northbound direction. This improvement is identified in the Marina del Rey TIP as a Category 1 improvement, and will enhance the traffic flow within the Marina.

- Admiralty Way and Mindanao Way – Install dual left-turn lanes on Admiralty Way for southbound travel at the approach to Mindanao Way and modify the traffic signal to provide a westbound right-turn phase concurrent with the southbound left-turn movement. The dual left-turn lanes on Admiralty Way will enhance egress from the Marina at Mindanao Way, has already been approved as part of a previous project (Marina Two), and would mitigate to less than significance the combined traffic impacts of both projects. It should be noted that this improvement is not included in the TIP. As such, the proposed project would be conditioned to contribute "fair share" funding to this improvement above and beyond the previously identified traffic mitigation fees. The project's "fair share" proportion would be negotiated between the proposed project and the County.

The measures listed above are recommended to address the potential project-specific traffic impacts identified in this report. These measures are identical to or consistent with the area-wide roadway improvements described in Appendix G (Transportation Improvement Program -- TIP) of the Marina del Rey Local Implementation Program. Implementation of these measures will reduce all project traffic impacts to less than significant levels.

In addition to project-specific traffic impacts, an analysis of cumulative traffic impacts at the study intersections indicates that traffic resulting from total development throughout the project vicinity, including the proposed project, could produce significant impacts at 12 of the 17 locations analyzed. The TIP improvements are designed to address traffic

growth due to cumulative development within and surrounding the Marina. However, the County acknowledges that traffic growth within the project vicinity has outpaced the projections upon which the TIP trip fees were based, and therefore, an analysis of cumulative impacts with respect to the effectiveness of the proposed TIP improvements was requested.

The intersection improvement measures recommended in the TIP to address cumulative traffic impacts in the project vicinity are shown in Appendix G (Transportation Improvement Program -- TIP) of the Marina del Rey Local Implementation Program and described below.

- Admiralty Way and Via Marina – Reconstruct the intersection to provide for a realignment of Admiralty Way as a "through roadway" with the southern leg of Via Marina. As described above, the northern leg of Via Marina, south of Washington Boulevard, will intersect into Admiralty Way in a "T" configuration. The striping for turning movements at the reconfigured intersection will be constructed as dual left-turn and dual/triple right-turn movements. This improvement is identified in the Marina del Rey TIP, and will enhance traffic flow within the Marina.

- Washington Boulevard and Via Marina/Ocean Avenue – No feasible physical improvements are identified in the TIP that remain available to mitigate this potential cumulative impact. However, the County of Los Angeles Department of Public Works has identified an improvement at the nearby intersection of Washington Boulevard and Palawan Way that would provide additional egress from the Marina, reducing traffic volumes on the northbound approach of Via Marina at this intersection, and providing mitigation for the cumulative impacts. The proposed improvement would reconstruct the intersection of Washington Boulevard and Palawan Way to allow for dual northbound left-turns onto

westbound Washington Boulevard, and install a new traffic signal at that intersection. The improvement will provide an additional means of accessing westbound Washington Boulevard from westbound Admiralty Way, reducing the existing high northbound volumes at Washington Boulevard and Via Marina/Ocean Avenue. (See "Washington Boulevard and Palawan Way" below for additional details.)

In addition, the Marina del Rey TIP also identified an improvement at the intersection of Via Marina and Admiralty Way that will enhance traffic flow between Admiralty Way and Via Marina south of Admiralty Way within the Marina, reducing the northbound right-turn traffic volumes on Via Marina at Washington Boulevard. This improvement would reconstruct the Admiralty Way/Via Marina intersection to realign Admiralty Way as a "through roadway" with the southern leg of Via Marina. The northern leg of Via Marina, south of Washington Boulevard, will intersect into Admiralty Way in a "T" configuration. The striping for turning movements at the reconfigured intersection will be constructed as dual left and dual/triple right-turning movements. As a result, northbound traffic volumes on Via Marina would need to turn left (instead of making a through movement) at Admiralty Way to access eastbound Washington Boulevard. Due to the high left-turn volume on northbound Via Marina at Admiralty Way, some of these traffic volumes would reroute along eastbound Admiralty Way and turn left at Palawan Way.

- Admiralty Way and Palawan Way – Restripe the southbound approach to convert the through lane into a left/through shared lane. Restripe the northbound approach to provide an exclusive right-turn only lane, in addition to a shared left-turn/through lane. In addition, add a third westbound through lane to Admiralty Way within the existing right-of-way by moving the median

and restriping Admiralty Way. This measure is identical to or consistent with the improvements in the Marina del Rey TIP.

- Washington Boulevard and Palawan Way – Install a new traffic signal at this intersection (as described above as "in lieu" mitigation for the cumulative impact at Washington Boulevard and Via Marina/Ocean Avenue). The south leg of the intersection should be realigned to reduce the angle of the northbound right-turn only lane, and provide a more perpendicular approach, plus provide northbound dual left-turn lanes.

  While this improvement is currently being investigated by the County for implementation as a new TIP- type measure, funded by fair share contributions by projects within Marina del Rey, it is not currently included in the TIP improvement program. As such, the proposed project would be conditioned to contribute "fair share" funding to this improvement above and beyond the previously identified traffic mitigation fees. As indicated in Table 10, the project will contribute 8 percent of the impact at this location. Cost estimates for this improvement are currently being finalized, but are expected to be between approximately $150,000 and $180,000, with a project responsibility of $12,000 to $14,400.

- Lincoln Boulevard and Washington Boulevard – No feasible physical improvements are currently available to mitigate this potential cumulative impact. However, regional transportation improvements being considered include the future extension of the Marina Freeway (SR 90) westward to connect with Admiralty Way. The extension, slated for completion by the year 2016, will help alleviate traffic congestion in the area, including at the key intersection of Lincoln Boulevard and Washington Boulevard. However, it should be noted that a short-term cumulative traffic impact could remain at this

location should the extension of the SR-90 or another measure of equal effectiveness is not implemented by the time the anticipated cumulative traffic growth occurs. This measure is identified in Appendix G of the Marina del Rey Local Implementation Program and must receive approval from the Board of Supervisors, the City of Los Angeles and Caltrans.

Furthermore, if the extension of the SR-90 is not constructed at all (due to not having concurrent approval by the Board of Supervisors, the City of Los Angeles and Caltrans, or for other reasons) or another measure of equal effectiveness is not identified, a significant cumulative traffic impact would remain at this location.

- Lincoln Boulevard and Marina Expressway (SR 90) – Extend Route 90 to connect to Admiralty Way across Lincoln Boulevard. The extension would reconstruct and expand the at-grade intersection, providing additional capacity for all approaches. This improvement is currently included in the TIP roadway improvements funded by the trip fee.

  However, it should be noted that a short-term cumulative traffic impact could remain at this location if the extension of the SR-90 or another measure of equal effectiveness is not implemented by the time the anticipated cumulative traffic growth occurs. Furthermore, if the extension of the SR-90 is not constructed at all (due to not having concurrent approval by the Board of Supervisors, the City of Los Angeles and Caltrans, or for other reasons) or another measure of equal effectiveness is not identified, a significant cumulative traffic impact could remain at this location.

- Lincoln Boulevard and Bali Way – No feasible physical improvements are currently available to mitigate this potential cumulative impact. However,

regional transportation improvements being considered include the future extension of the Marina Freeway (SR 90) westward to connect with Admiralty Way. The extension, slated for completion by the year 2016, will help alleviate traffic congestion in the area, including at the intersection of Lincoln Boulevard and Bali Way. However, it should be noted that a short-term cumulative traffic impact could remain at this location if the extension of the SR-90 or another measure of equal effectiveness is not implemented by the time the anticipated cumulative traffic growth occurs. The SR-90 extension is identified in Appendix G of the Marina del Rey Local Implementation Program and must receive approval from the Board of Supervisors, the City of Los Angeles and Caltrans.

Furthermore, if the extension of the SR-90 is not constructed at all (due to not having concurrent approval by the Board of Supervisors, the City of Los Angeles and Caltrans, or for other reasons) or another measure of equal effectiveness is not identified, a significant cumulative traffic impact could remain at this location.

- Lincoln Boulevard and Mindanao Way – No feasible physical improvements are currently available to mitigate this potential cumulative impact. However, regional transportation improvements being considered include the future extension of the Marina Freeway (SR 90) westward to connect with Admiralty Way. The extension, slated for completion by the year 2016, will help alleviate traffic congestion in the area, including at the intersection of Lincoln Boulevard and Mindanao Way, which currently provides direct access from the SR-90 to Admiralty Way in the Marina, by providing a direct access alternative route. However, it should be noted that a short-term cumulative traffic impact could remain at this location if the extension of the SR-90 or another measure of

equal effectiveness is not implemented by the time the anticipated cumulative traffic growth occurs. The SR-90 extension is identified in Appendix G of the Marina del Rey Local Implementation Program and must receive approval from the Board of Supervisors, the City of Los Angeles and Caltrans.

Furthermore, if the extension of the SR-90 is not constructed at all (due to not having concurrent approval by the Board of Supervisors, the City of Los Angeles and Caltrans, or for other reasons) or another measure of equal effectiveness is not identified, a significant cumulative traffic impact could remain at this location.

- Lincoln Boulevard and Fiji Way – No feasible physical improvements are currently available to mitigate this potential cumulative impact. However, regional transportation improvements being considered include the future extension of the Marina Freeway (SR 90) westward to connect with Admiralty Way. The extension, slated for completion by the year 2016, will help alleviate traffic congestion in the area, including at the intersection of Lincoln Boulevard and Fiji Way. However, it should be noted that a short-term cumulative traffic impact could remain at this location if the extension of the SR-90 or another measure of equal effectiveness is not implemented by the time the anticipated cumulative traffic growth occurs. The SR-90 extension is identified in Appendix G of the Marina del Rey Local Implementation Program and must receive approval from the Board of Supervisors, the City of Los Angeles and Caltrans.

  Furthermore, if the extension of the SR-90 is not constructed at all (due to not having concurrent approval by the Board of Supervisors, the City of Los Angeles and Caltrans, or for other reasons) or another measure of equal

effectiveness is not identified, a significant cumulative traffic impact could remain at this location.

- Admiralty Way and Bali Way – Add a third westbound through lane to Admiralty Way within the existing right-of-way by moving the median and restriping Admiralty Way, as identified in the TIP.

- Admiralty Way and Mindanao Way – Widen northbound Admiralty Way to provide a right-turn lane at Mindanao Way, as identified in the TIP. Also, install dual left-turn lanes on Admiralty Way for southbound travel at the approach to Mindanao Way and modify the traffic signal to provide a westbound right-turn phase concurrent with the southbound left-turn movement. The dual left-turn lanes on Admiralty Way will enhance egress from the Marina at Mindanao Way, and has already been approved as part of a previous project (Marina Two). In addition, restripe the left-turn lane in the eastbound direction to a left-through shared lane. A second receiving lane is already present on the east leg departure from this intersection. It should be noted that the installation of dual left-turn lanes on Admiralty Way, the traffic signal modification and the restripe of the left-turn lane in the eastbound direction to a left-through shared lane are not identified in the TIP. As such, the proposed project would be conditioned to contribute "fair share" funding to this non-TIP improvement above and beyond the previously identified traffic mitigation fees. The project's "fair share" proportion would be negotiated between the proposed project and the County.

- Marina Expressway (SR 90) Eastbound and Mindanao Way – Restripe Mindanao Way to provide two through lanes and one free right-turn lane in the eastbound approach. Also provide an appropriate receiving and merge area on the eastbound Marina Expressway for the free right-turn movement from

eastbound Mindanao Way. No additional right-of-way is required for this measure. This improvement is not identified in the TIP. As such, the proposed project would be conditioned to contribute "fair share" funding to this non-TIP improvement above and beyond the previously identified traffic mitigation fees. The project's "fair share" proportion would be negotiated between the proposed project and Caltrans.

The implementation of the cumulative mitigation measures cited above would result in a reduction of all cumulative traffic impacts at all study intersections. At intersections where the "With Cumulative Development Plus Mitigation" traffic conditions can be evaluated, cumulative impacts would be reduced to a less than significant level. Since the design of the proposed SR-90 extension has not been determined, however, calculation of the exact benefits to specific intersections for which the extension is identified in the Marina del Rey Land Use Plan (LUP) as mitigation cannot be made at this time. The County is currently preparing an Environmental Impact Report for this roadway improvement that will identify the anticipated benefits to the Lincoln Boulevard corridor as a result of the SR-90 extension to Admiralty Way.

Condition of approval for developments within the Marina is described in the Marina del Rey LUP and summarized below:

> "Development shall not be approved that will significantly exceed the capacity of the sub-regional street system. Traffic impacts, generated by development in the LCP study area, upon the circulation system outside the unincorporated area of Marina del Rey, shall be mitigated by the developer prior to receiving final discretionary permits." *

* Marina del Rey Land Use Plan, County of Los Angeles Department of Regional Planning, C.11 Circulation, Page 11-18.

In summary, the cumulative mitigation measures include measures specifically identified in the TIP, including funding for larger long-term improvements such as the planned Marina Expressway (SR-90) extension to Admiralty Way that will increase area-wide traffic capacity and help alleviate existing and future congestion in the study area. If one or more of these measures are not installed, significant cumulative traffic impacts would remain.

The project is responsible for its "fair share" portion of implementation of the cumulative mitigation improvements described above. The measures listed above, with the exceptions of the new traffic signal at Washington Boulevard and Palawan Way, the installation of the dual left-turn lanes, the traffic signal modification and the restripe of the left-turn lane to a left-through shared lane in the eastbound direction at Admiralty Way and Mindanao Way, and the installation of a free right-turn lane on Mindanao Way in the eastbound direction at the SR-90 eastbound approach -- are identical to or consistent with the area-wide roadway improvements described in Appendix G (Transportation Improvement Program) of the Marina del Rey Local Implementation Program. Therefore, payment of the Marina del Rey trip mitigation fees plus the pro-rata share for the added measures will fund these recommended (or other County approved) measures to address cumulative impacts.

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INTRODUCTION

As described in greater detail in the Executive Summary above, Legacy Partners and Woodfin, propose to construct a total of 526 residential apartment units, a hotel/timeshare resort containing 288 hotel and timeshare suites and an assortment of patron- and visitor- serving accessory uses, 174 private and between seven and 11 public/transient boat spaces and dinghy moorage , and an approximately 1.46-acre public wetland park on and/or adjacent to Parcels 10R, FF and 9U, situated generally along the east side of Via Marina in Marina del Rey, within the County of Los Angeles. The project would replace a total of approximately 136 existing apartments, at least 184 boat spaces (on Parcel 10R) and 207 surface parking spaces (on Parcel FF).

The County of Los Angeles has requested that a traffic study be conducted, and Crain & Associates has been retained to assess the potential impacts of the proposed development on the surrounding street system. This report presents the results of an analysis of existing conditions as well as projected traffic conditions before and after completion of the project. The analysis incorporates a detailed evaluation of existing and future traffic conditions at the following 17 study intersections:

1. Via Marina/Tahiti Way
2. Via Marina/Marquesas Way
3. Via Marina/Panay Way
4. Admiralty Way/Via Marina
5. Washington Boulevard/Ocean Avenue/Via Marina
6. Admiralty Way/Palawan Way
7. Washington Boulevard/Palawan Way
8. Lincoln Boulevard/Washington Boulevard
9. Lincoln Boulevard/Marina Expressway (SR 90)
10. Lincoln Boulevard/Bali Way
11. Lincoln Boulevard/Mindanao Way
12. Lincoln Boulevard/Fiji Way

13. Admiralty Way/Bali Way
14. Admiralty Way/Mindanao Way
15. Admiralty Way/Fiji Way
16. Marina Expressway (SR 90) Westbound/Mindanao Way
17. Marina Expressway (SR 90) Eastbound/Mindanao Way

The location of the project site and the study intersections are shown on Figure 1, Project Site Vicinity and Study Intersection Locations. The intersections are located within the area surrounding the project site, and were selected for detailed analyses as they are expected to be those locations most directly impacted by the proposed project's traffic generation.

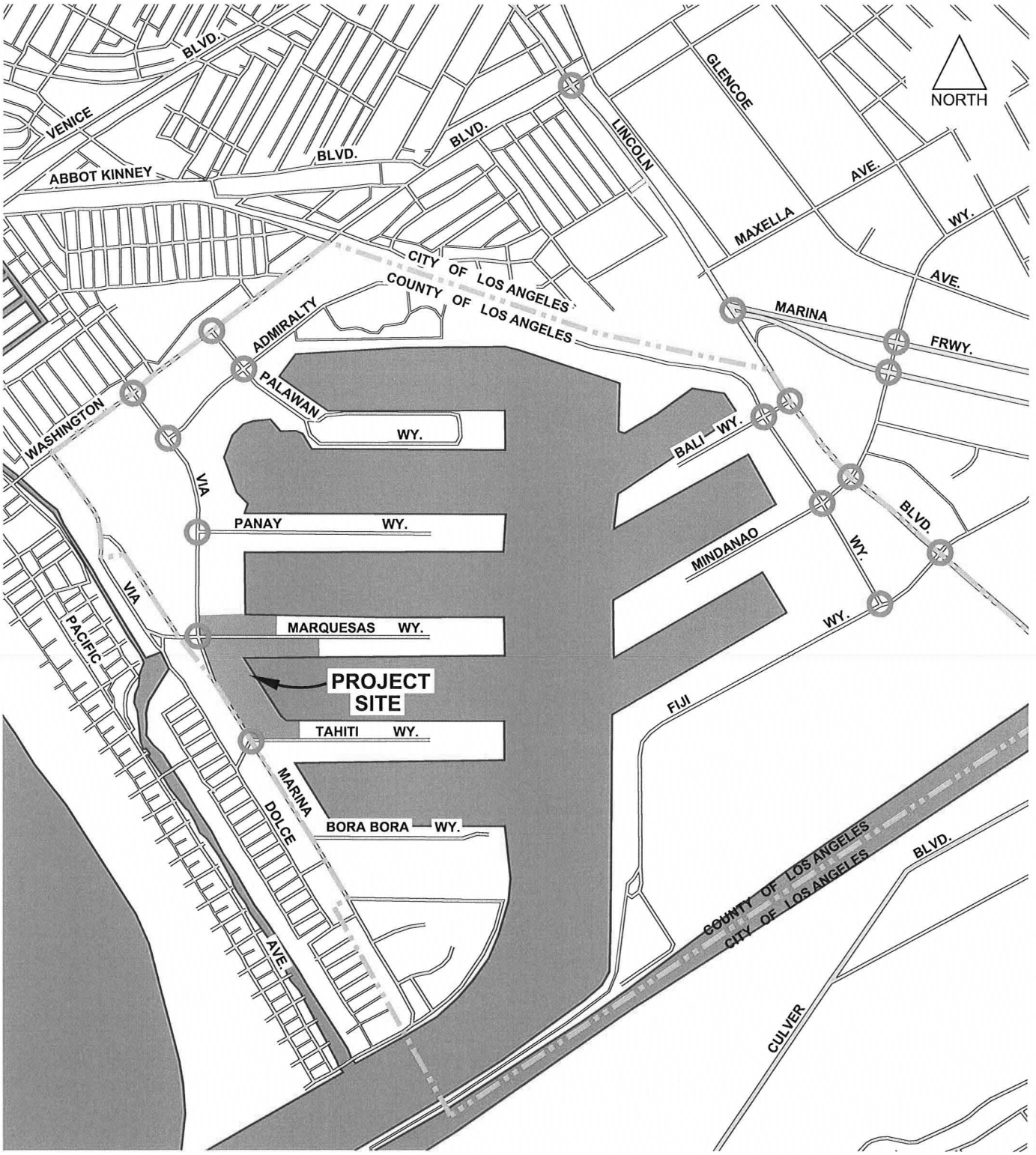

FIGURE 1

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\STUDY-INTS

PROJECT SITE VICINITY AND
STUDY INTERSECTION LOCATIONS

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PROJECT DESCRIPTION

As noted, the project under consideration is the development of a total of 526 residential apartment units, a hotel/timeshare resort containing 288 hotel and timeshare suites and an assortment of patron- and visitor- serving accessory uses, 174 private and between seven and 11 public/transient boat spaces and dinghy moorage , and an approximately 1.46-acre public wetland park on and/or adjacent to Parcels 10R, FF and 9U, situated generally along the east side of Via Marina in Marina del Rey, within the County of Los Angeles. The project site layout on Parcels 10R, FF and 9U are shown in Figures 2(a), 2(b) and 2(c), respectively. The amount of proposed development on each of the three parcels is described below:

Parcel 10R

A total of 400 residential apartment units would be developed along the south side of Marquesas Way, as well as along the east side of Via Marina south of Marquesas Way. The project would also provide a total of 174 boat spaces (including 161 boat slips and 13 end tie spaces) on the water portion of Parcel 10R within Marina Basin B. The Parcel 10R site is currently developed with a total of 136 residential units and at least 184 boat slips (Neptune Marina), which would be removed in order to construct the proposed project uses on this parcel.

Parking for the 400 residential apartment units and 174 boat spaces would be generally provided in a combination of subterranean and semi-subterranean structures located beneath each of the three apartment buildings within the Parcel 10R development site. Access to the parking garages would be provided from multiple driveways along Marquesas Way, with additional access to the parking facility for the Parcel 10R

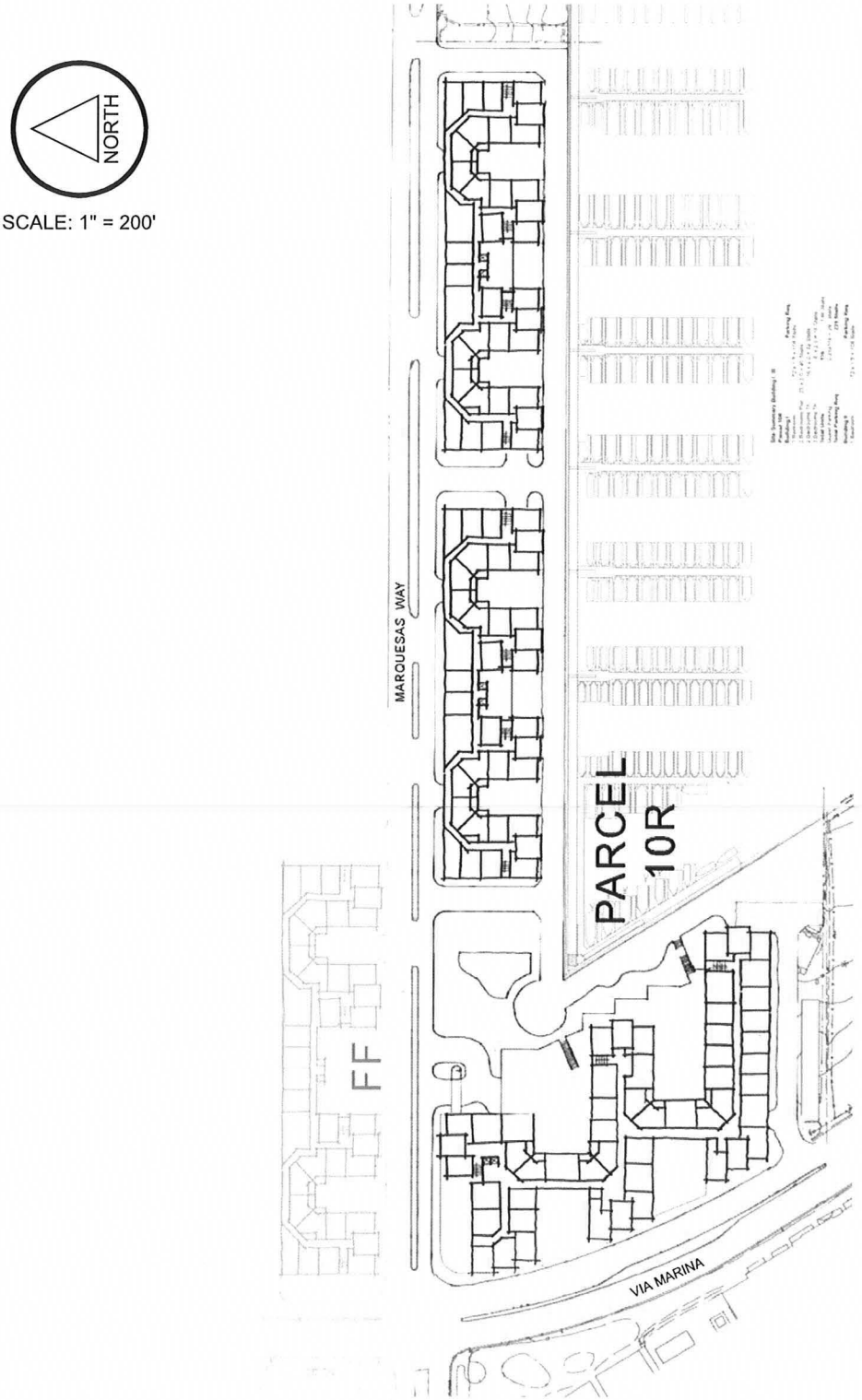

FIGURE 2(a)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\SITE-PLAN(10R)

PROJECT SITE LAYOUT
PARCEL 10R

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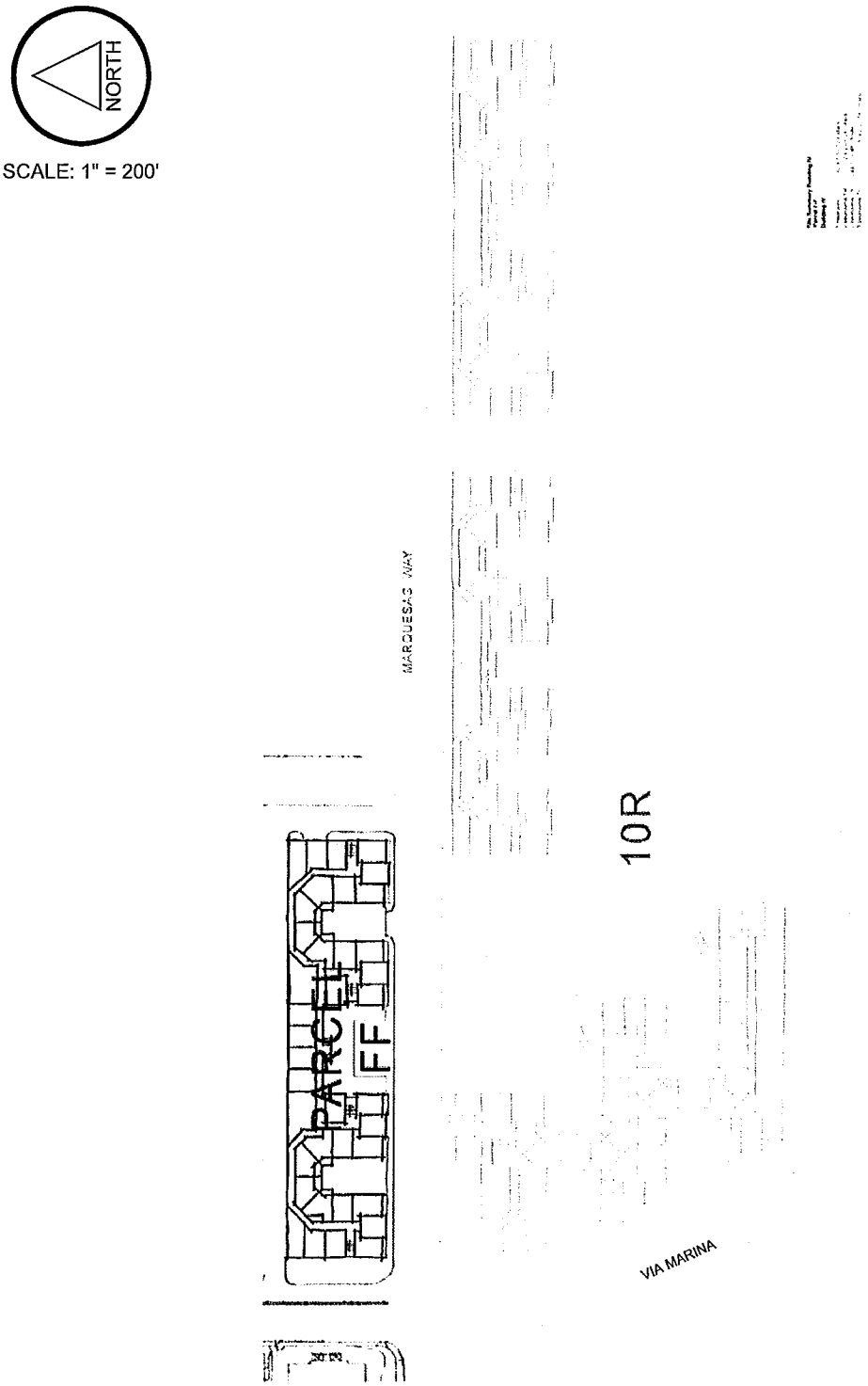

FIGURE 2(b)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\SITE-PLAN(FF)

PROJECT SITE LAYOUT
PARCEL FF

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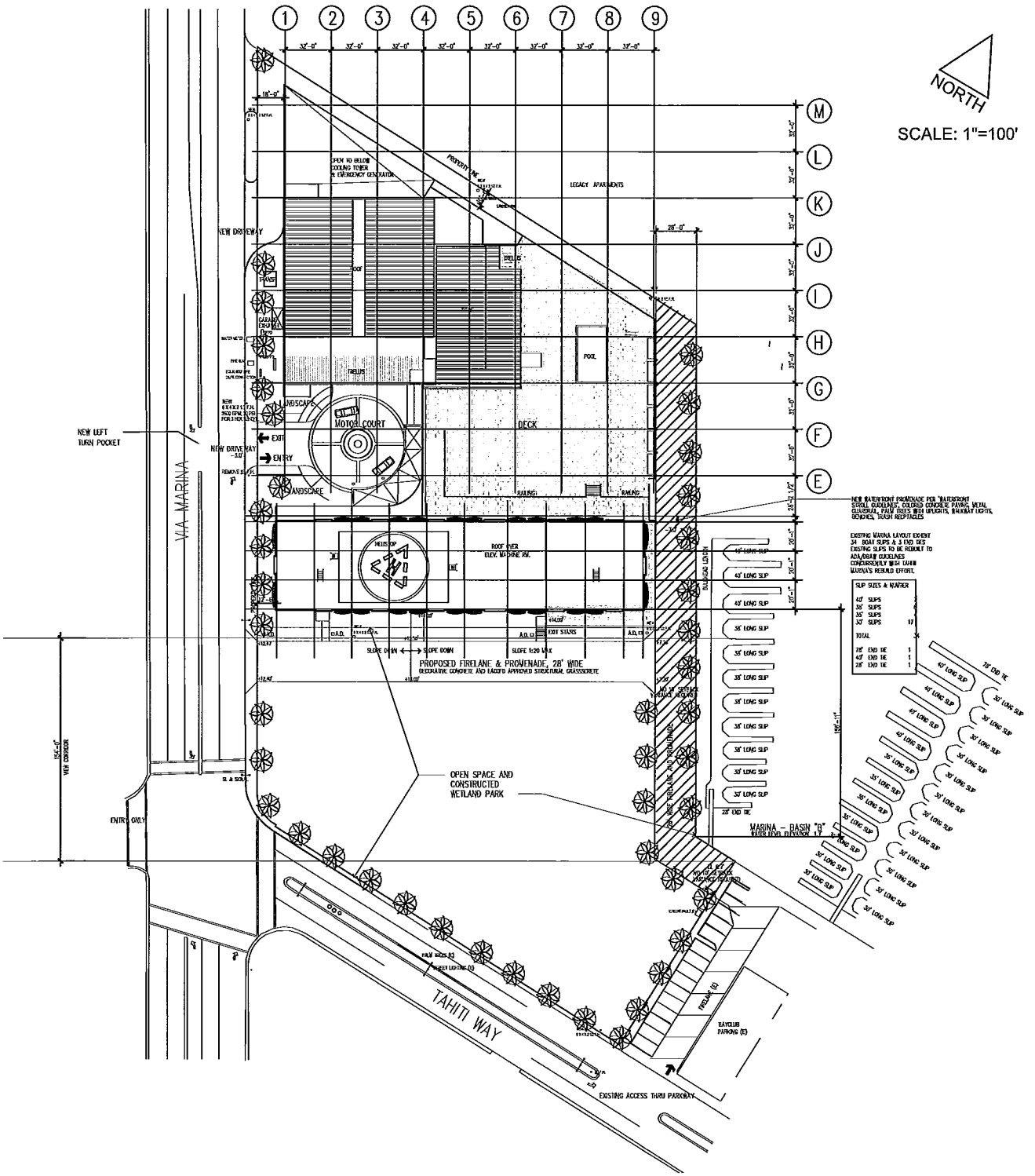

FIGURE 2(c)

2/15/2007

FM: MARINA DEL REY LEGACY\REPORT(2-2007)\SITEPLAN(9U)

PROJECT SITE LAYOUT
PARCEL 9U

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apartment building fronting Via Marina provided via a driveway on Via Marina. A median "cut" already exists on Via Marina at the approximate location of this proposed driveway, to allow vehicular access from the north. The Parcel 10R development would provide a minimum of 908 spaces for the residents and guests of the 400 proposed apartments and for the 174 boat spaces

Parcel FF

A total of 126 apartment units would be developed along the north side of Marquesas Way and on the east side of Via Marina. Parcel FF is currently developed with a 207-space public parking lot for use by area residents and visitors. This public parking lot is underutilized (average of about 23 vehicles parking on the lot each day) and would be removed in anticipation of the proposed project on Parcel FF.

Parking for the 126 apartment units would be generally provided in subterranean and semi-subterranean structures located beneath each development site. Access to the Parcel FF parking garages would be provided from multiple driveways along Marquesas Way. The proposed project would provide a minimum of 242 spaces for use by residents, including a minimum of approximately 32 guest spaces, for the 126 residential units.

Parcel 9U

As noted, a 288-suite hotel/timeshare resort and an approximately 1.46-acre public park would be developed on the north side of Tahiti Way and on the east side of Via Marina. Parcel 9U is currently vacant.

The hotel/timeshare resort would be developed on the northern portion of Parcel 9U on approximately 2.20 acres. The hotel/timeshare resort would consist of 152 hotel suites and 136 timeshare suites as well as amenities including 6,105 square feet of restaurant

and bar lounge seating areas, 3,400 square feet of meeting rooms, 5,200 square feet of ballroom uses, 5,555 square feet of spa use, and a 1,176 square foot sundry shop. The amenities would primarily serve guests of the hotel/timeshare resort.

The southern portion of Parcel 9U would be developed with an approximately 1.46-acre public "wetlands" park, at the northeast corner of Via Marina and Tahiti Way. Woodfin would construct the park, though Legacy Partners would fund 50 percent of the park's development cost.

Parking for the 288-suite hotel/timeshare resort would be provided in a five-level above grade parking structure and one-level below grade parking area. The proposed hotel/timeshare resort will accommodate a total of 360 spaces including 339 valet spaces and 21 fee-based "self-park" spaces. Access to the parking facility on the Parcel 9U site would be provided by a new driveway off of Via Marina. Currently, a median island exists on Via Marina at the location of the new hotel/timeshare resort driveway. The project proposes an opening in the median island on Via Marina in order to provide full left- and right-turn access and egress at the new driveway.

In addition, the Parcel 9U site will accommodate a loading area that will be located north of the hotel/timeshare resort. The loading area will have three spaces. Access will be provided via two service driveways further to the north along Via Marina. These driveways are proposed to be restricted to "right-in/right-out" operation due to the raised median island on Via Marina.

ENVIRONMENTAL SETTING

The proposed project is located in the unincorporated community of Marina del Rey, in the County of Los Angeles. The site is served by the regional facilities of Lincoln Boulevard (State Route 1), the Marina Freeway/Expressway (State Route 90) and the San Diego Freeway (Interstate Route 405). The San Diego Freeway has an interchange at the Marina Freeway, approximately four miles east of the site. The Marina Freeway/Express way provides surface street access at Culver Boulevard (currently being reconstructed as a freeway interchange), Mindanao Way, and at its western terminus at Lincoln Boulevard.

Most of the area surrounding the project site has been developed, with the exception of the Ballona Creek Wetlands, south of Culver Boulevard in Playa del Rey and Westchester, although some of the Ballona Creek Wetlands is currently undergoing development. Surrounding areas to the north and east have been developed as single- and multi-family residential communities. Commercial areas are situated along nearby Washington Boulevard, throughout Marina del Rey along and off of Admiralty Way, and along the Lincoln Boulevard corridor to the east.

Freeways

The San Diego Freeway (Interstate 405) is the most important traffic facility in the area. This freeway traverses north-south through the Greater Los Angeles metropolitan area, and provides convenient project access, via the regional freeway system, to all other areas of the Los Angeles region. This route is also an important link to the other parts of California. The San Diego Freeway, in this vicinity, is a nine- or ten-lane facility, depending on the segment, and currently carries in excess of 298,000 vehicles per day (VPD). In addition, a high-occupancy vehicle (HOV) lane has been added to this facility. The San Diego Freeway provides a full interchange with the western portion of the

Marina Freeway/Expressway. Northbound-to-eastbound, and westbound-to-southbound movements are not allowed at this interchange.

The Marina Freeway/Expressway (State Route 90) is a short regional facility serving a roughly east-west alignment between Slauson Avenue (east of Sepulveda Boulevard) and Lincoln Boulevard. The elevated freeway sections of this facility, between Culver Boulevard on the west and the Slauson Avenue terminus on the east, provides a three-lane per direction configuration, with additional lanes provided at the interchange with the San Diego Freeway. Surface street access ramps are currently provided only from Sepulveda Boulevard (to the eastbound Marina Freeway only), at Centinela Avenue and at Culver Boulevard. Additional extension of the freeway to Admiralty Way is also being planned. This portion of the Marina Freeway carries more than 75,000 VPD.

The at-grade expressway portion of the facility, between Culver Boulevard and Lincoln Boulevard, exhibits a two-lane per direction configuration, with localized flarings at intersections to accommodate additional left and/or right-turn lanes. The Expressway is a divided roadway, with no crossover traffic permitted except from the cross street intersections with Culver Boulevard and Mindanao Way.

Streets and Highways

Important surface highway facilities in the area near the proposed project include Washington Boulevard, Lincoln Boulevard, and Admiralty Way. Washington Boulevard is designated as a Class II Major Highway on the General Plan for the City of Los Angeles. Lincoln Boulevard is designated as a Class I Major Highway south of Washington Boulevard and a Class II Major Highway north of Washington Boulevard. Admiralty Way is a collector facility that traverses along the northern and eastern edges of Marina del Rey between Via Marina, just to the north of the project site, and Fiji Way near Lincoln Boulevard. Admiralty Way provides the project's most direct access

to/from the Marina Freeway/Expressway (via Mindanao Way), and other regional travel facilities.

Washington Boulevard is an east-west Class II Major Highway that is located about three-quarter-mile north of the project site. In the project vicinity, Washington Boulevard is approximately 80 feet wide, and provides two through lanes in each direction, plus full left-turn channelization at most cross streets. Bicycle lanes are provided and on-street parking is allowed along Washington Boulevard in the project vicinity.

Admiralty Way is a four-lane collector facility, serving as a "frontage road" around the north and east portions of the Marina, between Via Marina on the west and Fiji Way on the southeast. Admiralty Way provides two lanes per direction plus left-turn channelization at key intersections. A raised center median exists along the length of Admiralty Way. Admiralty Way "tees" at both ends, into Fiji Way on the south and into Via Marina to the west.

Via Marina is generally a north-south facility that serves the western portion of Marina del Rey. This roadway also forms the western boundary of the project site and serves as the main access roadway for the project. Via Marina extends from the water entrance to the Marina north to Washington Boulevard (where it aligns with Ocean Avenue) and then the roadway becomes Venice Way, bends to the west, and terminates at Pacific Avenue. Via Marina provides two to three through lanes in each direction plus left-turn channelization at key intersections.

Lincoln Boulevard (State Route 1) is developed to a typical width of 80 feet in the study area, although south of the Culver Boulevard overpass, Lincoln Boulevard widens to provide three through lanes in each direction plus a raised median island. In the project area, this facility is striped to provide a six-lane roadway with left-turn channelization (designated or permissive left-turn lanes) at most intersections. A raised median island exists on Lincoln Boulevard from Fiji Way north to the Marina Expressway intersection.

On-street parking is prohibited on this portion of Lincoln Boulevard at all times, but is allowed on a time-restricted basis on both sides of the street north of Maxella Avenue.

Tahiti Way is a short two-lane local street that provides access to the Marina del Rey "Basin A" and "Basin B" areas. This roadway forms the southern boundary of the project site. Tahiti Way access west of Via Marina is restricted to westbound (entry only) traffic.

Marquesas Way is designated a local street. This two-lane facility is located opposite Via Dolce at Via Marina, and provides access to the "Basin B" and "Basin C" areas.

Panay Way is designated a local street and provides access to the Marina del Rey "Basin C" and "Basin D" areas. Panay Way provides one lane in each direction.

Palawan Way is designated a local street. This facility provides two lanes per direction on the segment between Admiralty Way and Washington Boulevard, separated by a raised median island. However, at the "tee" intersection with Washington Boulevard, northbound Palawan Way narrows to provide a right-turn lane only. This intersection is not signalized, but is instead controlled by a STOP sign on the Palawan Way approach. Conversely, at the signalized intersection with Admiralty Way, Palawan Way provides three lanes, including a left-turn only lane, a through lane, and a right-turn only lane. South of Admiralty Way, Palawan Way provides access to restaurant and commercial uses.

Bali Way is a short local street providing access from Lincoln Boulevard and Admiralty Way to the Marina del Rey "Basin F" and "Basin G" areas. Bali Way provides only a single lane in each direction.

Mindanao Way is a Secondary Highway providing two lanes in each direction, although some sections are widened to permit additional traffic lanes and/or turn-lane channelization, particularly at the Marina Expressway and Lincoln Boulevard

intersections. At Lincoln Boulevard, Mindanao Way provides dual left-turn channelization. East of Alla Road, Mindanao Way changes names to become Short Avenue, which terminates at Centinela Avenue approximately 2/3 of a mile east of Alla Road. West of Lincoln Boulevard, Mindanao Way crosses Admiralty Way to provide access to Burton Chase Park and the Marina del Rey "Basin G" berths. Mindanao Way also provides the closest surface street link to the Marina Expressway to the east in the project area (other than the somewhat circuitous route using the Lincoln Boulevard connection).

Fiji Way is designated a local street. This facility is discontinuous and provides one lane per direction plus on-street parking from east of Lincoln Boulevard to the eastern terminus at La Villa Marina. West of Lincoln Boulevard, Fiji Way typically provides two lanes per direction, and serves as access to the "Fisherman's Village" portion of Marina del Rey, as well as to residential development and the U.S. Coast Guard Harbor Patrol station near the Ballona Creek "point". On-street parking is prohibited west of Lincoln Boulevard.

Intersection Traffic Control

All of the study intersections are traffic signal-controlled, with the exception of Washington Boulevard and Palawan Way, which is a "tee" intersection and STOP sign controlled on the Palawan Way approach. Additionally, all of the signalized intersections are upgraded with the City of Los Angeles' Automated Traffic Surveillance and Control (ATSAC) and second generation Adaptive Traffic Control System (ATCS) traffic signal coordination systems. These signal coordination systems monitor and evaluate traffic demands throughout the study area in real time, and adjust the traffic signal timings, phasings and offsets accordingly to maximize traffic capacity.

Existing Traffic Volumes

Traffic volume data were obtained from recent counts conducted in years 2006 and 2007 by The Traffic Solution (an independent traffic data collection company) and Crain

& Associates personnel, except for the counts at the intersection of Washington Boulevard and Palawan Way that was conducted in October 2005. (Traffic count data was also collected in 2007 at this location but was found to be lower than the 2005 counts. To be conservative, the higher 2005 counts were used for this intersection.)

Counts conducted in 2005 and 2006 were growth factored by 0.6 percent per year to estimate year 2007 traffic conditions. The traffic data sheets are contained in Appendix F. Additionally, San Diego Freeway and Marina Freeway/Expressway count data were obtained from the California Department of Transportation (Caltrans) publication. Existing AM and PM peak hour traffic volumes at the study intersections are shown on Figures 3(a) and 3(b), respectively, and are summarized for the key area roadways on the following pages.

The Marina Expressway, east of Mindanao Way, carries approximately 52,000 vehicles per day (VPD). Peak hour directional traffic volumes in this area are approximately 1,400 vehicles per hour (VPH) northbound and 1,700 VPH southbound during the AM peak hour, and about 1,400 VPH northbound and 1,700 VPH southbound in the PM peak hour.

Washington Boulevard, near Lincoln Boulevard, accommodates nearly 32,000 VPD. Peak hour directional traffic volumes in this area are approximately 1,300 VPH eastbound and 1,100 VPH westbound in the morning peak hour, and 2,000 VPH eastbound and 1,800 VPH westbound in the afternoon peak hour.

Admiralty Way near Via Marina exhibits daily traffic of approximately 18,000 VPD, including peak hour traffic of 1,100 VPH southbound and 1,200 VPH northbound in the morning peak hour, and 1,000 VPH northbound and 1,100 VPH southbound in the afternoon peak hour.

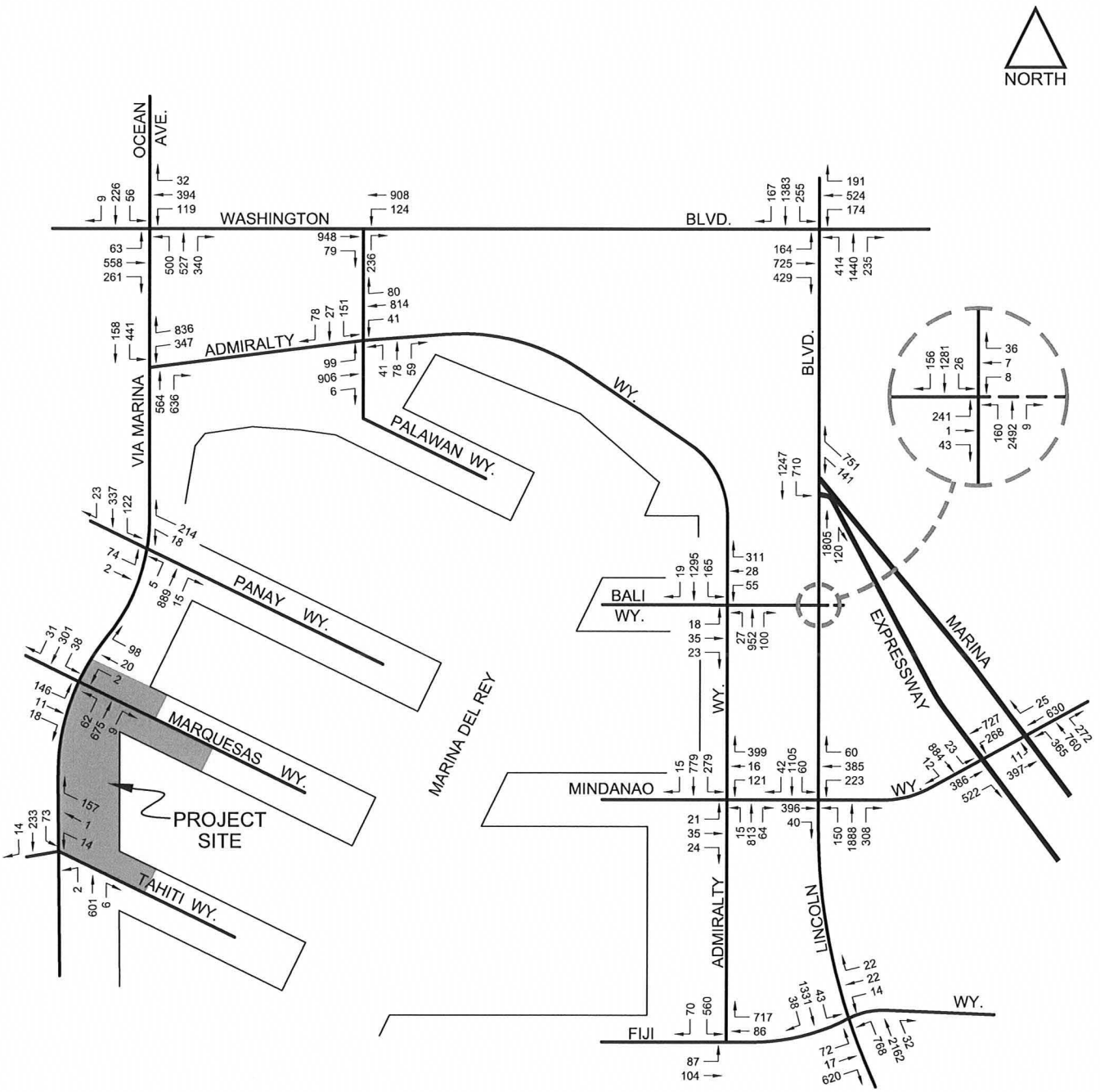

FIGURE 3(a)

5/24/2007

Marina del Rey Legacy\REPORT (2-2007)\AM2007EX

EXISTING (2007) TRAFFIC VOLUMES
AM PEAK HOUR

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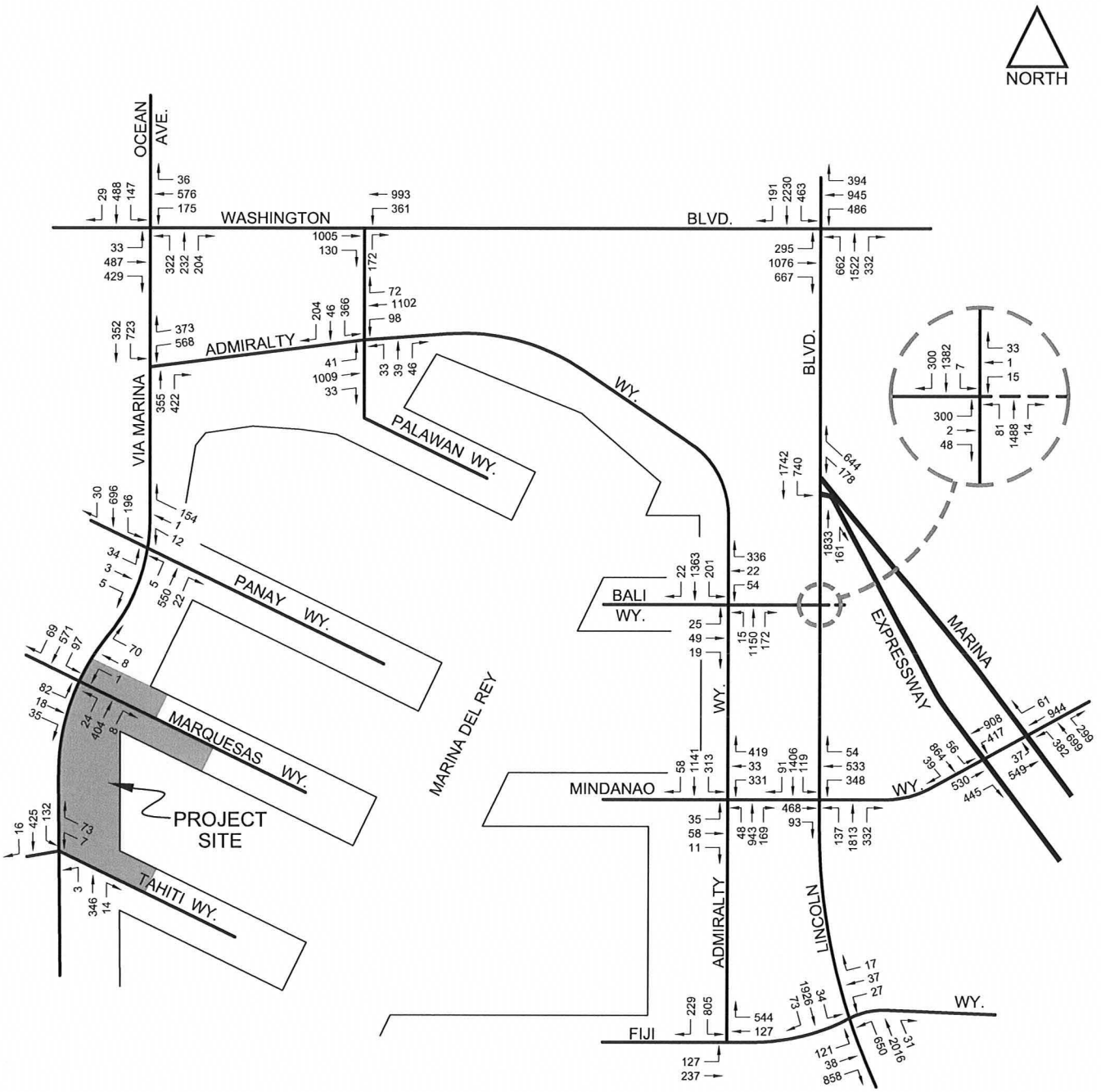

FIGURE 3(b)

5/24/2007

Marina del Rey Legacy\REPORT (2-2007)\PM2007EX

EXISTING (2007) TRAFFIC VOLUMES
PM PEAK HOUR

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Lincoln Boulevard is one of the most heavily traveled highways in the area, carrying approximately 60,000 VPD. Directional peak hour traffic volumes on Lincoln Boulevard south of the Marina Freeway are approximately 2,600 VPH northbound and 1,800 VPH southbound during the AM peak hour, and approximately 2,300 VPH southbound and 2,200 VPH northbound in the PM peak hour.

Via Marina, south of Admiralty Way, experiences about 14,200 VPD, with approximately 1,200 VPH northbound and 500 VPH southbound during the morning peak hour and approximately 800 VPH northbound and 900 VPH southbound during the afternoon peak hour.

Tahiti Way currently accommodates about 2,100 VPD just east of Via Marina, including directional peak hour volumes of about 170 VPH westbound and 80 VPH eastbound during the morning peak hour and approximately 150 VPH eastbound and 80 VPH westbound during the evening peak hour.

Marquesas Way carries approximately 1,000 VPD. Directional peak hour traffic volumes are approximately 120 VPH westbound and 60 VPH eastbound during the morning peak hour and approximately 80 VPH westbound and 120 VPH eastbound during the afternoon peak hour.

Panay Way carries about 3,100 VPD, including directional peak hour volumes of approximately 230 VPH westbound and 140 VPH eastbound during the AM peak hour and approximately 220 VPH eastbound and 170 VPH westbound during the PM peak hour.

Palawan Way, between Washington Boulevard and Admiralty Way, accommodates about 5,800 VPD. Directional peak hour traffic volumes are approximately 240 VPH northbound and 260 VPH southbound during the morning peak hour and approximately 170 VPH northbound and 620 VPH southbound during the afternoon peak hour.

Bali Way is traveled by an estimated 5,100 VPD, with peak hour directional volumes of 360 VPH westbound and 290 VPH eastbound in the AM, and 400 VPH westbound and 390 VPH eastbound in the PM.

Mindanao Way, between Lincoln Boulevard and the Marina Expressway, exhibits daily traffic of approximately 15,500 VPD, including approximately 900 VPH eastbound and 700 VPH westbound during the AM peak hour and approximately 1,000 VPH westbound and 950 VPH eastbound during the PM peak hour.

Fiji Way, west of Lincoln Boulevard, carries about 12,800 VPD, with directional peak hour volumes of over 800 VPH westbound and 700 VPH eastbound during the morning peak hour and approximately 1,000 VPH eastbound and 800 VPH westbound during the evening peak hour.

Public Transit

The Los Angeles County Metropolitan Transportation Authority (Metro) has established an extensive grid system of bus routes throughout the Los Angeles region, including the project vicinity, and adjacent jurisdictions such as the City of Los Angeles and the City of Culver City also provide transit service through the Marina del Rey study area. Although the site itself is not particularly well served by transit routes due to its location interior to a primarily residential area without through travel routes, several bus routes pass by within convenient walking distance of the project site, along Washington Boulevard and Admiralty Way. These bus routes, which provide the closest routes serving the project site, are described in the following section.

Metro Line 108 provides east-west service between Marina del Rey and Pico Rivera. In the study area, Line 108 operates a one-way loop route through the Marina, then travels primarily along Mindanao Way/Short Avenue, Centinela Avenue, Jefferson Boulevard, and Slauson Avenue between the Marina and Pico Rivera. Line 108 also serves Fox Hills Mall and the adjacent office developments

east of Sepulveda Boulevard, providing a link between the proposed project and these potential shopping and employment locations. In the Marina buses operate on weekdays with headways of approximately 30 to 45 minutes. Weekend and holiday service is provided on a limited schedule, with approximately 60 minute headways throughout the day.

LADOT Commuter Express Line 437 travels eastbound from Marina del Rey to Downtown Los Angeles during the morning peak commute period and westbound from Downtown during the afternoon peak commute period. In the project vicinity, Line 437 provides several stops along Via Marina, including at Panay Way and Marquesas Way near the project site. In the project area, this line travels along Pacific Avenue, Via Marina and Admiralty Way, continuing on Mindanao Way and Alla Road to Culver Boulevard through Culver City. Line 437 operates Monday through Friday only, on headways of approximately 15 to 30 minutes during the AM and PM peak commute periods.

Culver City Line 1 runs between the Venice community on the west and the West Los Angeles Transit Center on Washington Boulevard at Fairfax Avenue on the east. Line 1 travels south from Windward Avenue along Pacific Avenue to Washington Boulevard, where it continues along Washington Boulevard, with stops provided through Marina del Rey, Mar Vista, and Culver City. In the project vicinity, Line 1 provides a daily stop on Washington Boulevard at Via Marina on headways of approximately 15 to 30 minutes.

In addition to these key transit routes that are within walking distance of the project site, other bus routes that also serve the Marina del Rey community (e.g. along or near Lincoln Boulevard) include the Culver City Lines 2 and 7, and the Santa Monica Big Blue Bus Line 3 and Rapid 3. Many more bus routes are also available via transfers to other routes or transit providers. When transfer opportunities are considered, the project is well served by public transit. Thus, it is expected that some of the trips generated by the proposed project will utilize public transportation as their primary travel

mode instead of private vehicles. However, project trip generation documented in this study represents a "more than typical" case, since none of the future project trips were assigned to public transit.

Analysis of Existing Traffic Conditions

An analysis of current traffic conditions was conducted on the streets and highways serving the project area. Detailed traffic analyses of existing conditions were performed at the 17 intersections noted previously in this report. The traffic analysis was performed through the use of established traffic engineering techniques. Recent traffic information was obtained from counts of the study intersections. Information pertaining to intersection geometrics, parking restrictions, and signal operations were obtained through recent field surveys of the study locations so as to reflect any recent changes in traffic demand patterns. The lane configurations and signal operations at the study intersections are shown in Appendix G.

The methodology used in this study for the analysis and evaluation of traffic operations at each study intersection is based on procedures outlined in Circular Number 212 of the Transportation Research Board.[1] In the discussion of Critical Movement Analysis for signalized intersections, procedures have been developed for determining operating characteristics of an intersection in terms of the "Level of Service" provided for different levels of traffic volume and other variables, such as the number of signal phases. The term "Level of Service" describes the quality of traffic flow. Levels of Service A to C operate quite well. Level D typically is the level for which a metropolitan area street system is designed. Level E represents volumes at or near the capacity of the highway which might result in stoppages of momentary duration and fairly unstable flow. Level F occurs when a facility is overloaded and is characterized by stop-and-go traffic with stoppages of long duration.

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[1] Interim Materials on Highway Capacity, Circular Number 212, Transportation Research Board, Washington, D.C., 1980.

A determination of the Level of Service at an intersection, where traffic volumes are known or have been projected, can be obtained through a summation of the critical movement volumes at that intersection. Once the sum of critical movement volumes has been obtained, the values indicated in Table 1 can be used to determine the applicable Level of Service.

Table 1
Critical Movement Volume Ranges*
For Determining Levels of Service

Level of Service	Maximum Sum of Critical Volumes (VPH) Two Phase	Three Phase	Four or More Phases
A	900	855	825
B	1,050	1,000	965
C	1,200	1,140	1,100
D	1,350	1,275	1,225
E	1,500	1,425	1,375
F	----------Not Applicable----------		

* For planning applications only, i.e., not appropriate for operations and design applications.

"Capacity" represents the maximum total hourly vehicle volume movement in the critical lanes which has a reasonable expectation of passing through an intersection under prevailing roadway and traffic conditions. For planning purposes, capacity equates to the maximum value of Level of Service E, as indicated in Table 2. The Critical Movement Analysis (CMA) indices used in this study were calculated by dividing the sum of critical movement volumes by the appropriate capacity value for the type of signal control present or proposed at the study intersections. Thus, the Level of Service corresponding to a range of CMA values is shown in Table 2.

By applying this analysis procedure to the study intersections, the Critical Movement Analysis (CMA) value and the corresponding Levels of Service (LOS) for existing traffic conditions were calculated. Those values, for existing (2007) AM and PM peak hour conditions, are summarized in Table 3.

Table 2
Level of Service
As a Function of CMA Values

Level of Service	Description of Operating Characteristics	Range of CMA Values
A	Uncongested operations; all vehicles clear in a single cycle.	≤ 0.60
B	Same as above.	>0.60, ≤ 0.70
C	Light congestion; occasional backups on critical approaches.	>0.70, ≤ 0.80
D	Congestion on critical approaches, but intersection functional. Vehicles required to wait through more than one cycle during short peaks. No long-standing lines formed.	>0.80, ≤ 0.90
E	Severe congestion with some long-standing lines on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements.	>0.90, ≤ 1.00
F	Forced flow with stoppages of long duration.	> 1.00

Table 3
Critical Movement Analysis Summary
Existing (2007) Traffic Conditions

No.	Intersection	AM Peak Hour CMA	AM Peak Hour LOS	PM Peak Hour CMA	PM Peak Hour LOS
1.	Via Marina & Tahiti Wy.	0.266	A	0.172	A
2.	Via Marina & Marquesas Wy.	0.262	A	0.181	A
3.	Via Marina & Panay Wy.	0.347	A	0.254	A
4.	Admiralty Wy. & Via Marina	0.701	C	0.751	C
5.	Washington Blvd. & Ocean Ave./Via Marina	0.714	C	0.768	C
6.	Admiralty Wy. & Palawan Wy.	0.424	A	0.604	B
7.	Washington Blvd. & Palawan Wy.	0.643	B	0.719	C
8.	Lincoln Blvd. & Washington Blvd.	0.775	C	1.337	F
9.	Lincoln Blvd. & Marina Expwy. (SR-90)	0.679	B	0.721	C
10.	Lincoln Blvd. & Bali Wy.	0.651	B	0.512	A
11.	Lincoln Blvd. & Mindanao Wy.	0.724	C	0.849	D
12.	Lincoln Blvd. & Fiji Wy.	0.587	A	0.732	C
13.	Admiralty Wy. & Bali Wy.	0.459	A	0.577	A
14.	Admiralty Wy. & Mindanao Wy.	0.626	B	0.743	C
15.	Admiralty Wy. & Fiji Wy.	0.257	A	0.372	A
16.	Marina Expwy. (SR 90) WB & Mindanao Wy.	0.405	A	0.531	A
17.	Marina Expwy. (SR 90) EB & Mindanao Wy.	0.615	B	0.738	C

PROJECT TRAFFIC

The following section describes the methodology used and results of the calculations for traffic generation, distribution and assignment for the project.

Traffic Generation

Vehicle trip generation rates for various types of developments within the Marina are specified in Appendix G (Transportation Improvement Program) of the Marina del Rey Local Implementation Program, which is currently in effect and includes the project site. This document provides the PM peak hour trip rates for the proposed project's residential (apartment) components, as well as for the hotel/timeshare use and boat slip portions of the project. No trip rates are provided for the public park use; however, it was assumed that this project component would generate only nominal amounts of peak hour traffic. It should be noted that rather than the 50 weekday trips assumed, the ITE rates[3] indicate only 3 vehicle trips will be made to and from the park on an average weekday. Therefore, it is unlikely the park will generate any peak hour trips on an average weekday. In addition, the TIP does not specify daily or AM peak hour trip generation rates for any of the proposed uses. However, the traffic study upon which the TIP PM peak hour rates were derived does identify AM peak hour rates.[2] As these rates are consistent with the trip generation methodology utilized for the PM peak hour, the AM rates from the traffic study were also used. Daily trip rates were derived from Trip Generation, published by the Institute of Transportation Engineers (ITE)[3]. This document is the current industry standard for trip generation data. Daily trip generation factors for the proposed project uses were calculated based on the ratio of peak hour-to-daily rates for the ITE data, applied to the peak hour TIP rates. The trip rates used in the traffic analysis for the proposed project are listed in Table 4.

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[2] Table 2-11, Marina del Rey Traffic Study Final Report, DKS Associates in Association with Gruen Associates, January 17, 1991.

[3] Trip Generation, 6th Edition, Institute of Transportation Engineers, Washington, D.C., 2003.

Table 4
Project Trip Generation Rates

Apartments – per dwelling unit

Daily:	T = 3.960(U)
AM Peak Hour:	T = 0.349(U); I/B = 18%, O/B = 82%
PM Peak Hour:	T = 0.326(U); I/B = 68%, O/B = 32%

Hotel – per room

Daily:	T = 5.339(R)
AM Peak Hour:	T = 0.406(R); I/B = 54%, O/B = 46%
PM Peak Hour:	T = 0.353(R); I/B = 45%, O/B = 55%

Boat Slips – per berth

Daily:	T = 2.883(S)
AM Peak Hour:	T = 0.126(S); I/B = 34%, O/B = 66%
PM Peak Hour:	T = 0.137(S); I/B = 36%, O/B = 64%

Where:

U = Dwellling Units	T = Trip Ends
R = Hotel Rooms	I/B = Inbound Trip Percentage
S = Boat Slips	O/B = Outbound Trip Percentage

Applying the trip generation rates shown in Table 4, the traffic expected to be generated by the project was calculated, and is summarized in Table 5. As shown in this table, the total project (Parcels FF, 10R and 9U) is expected to generate approximately 3,104 net new trips per day, with about 253 trips occurring during the morning peak hour, and 228 trips occurring during the evening peak hour. This amount of new trips will be added to the project area roadway network once the existing development on the sites is demolished and the proposed project is completed and fully occupied. For Parcel 10R, the residential portion is expected to produce approximately 1,045 net new daily trips, including 93 net AM peak hour trips and 86 net PM peak hour trips. The boat slip portion is expected to result in a decrease of 28 net daily trips, including a decrease of 1 net trip during both the AM and PM peak hours. The combined residential and boat slip uses for Parcel 10R would produce approximately 1,017 net new daily trips, including 92 net AM peak hour trips and 85 net PM peak hour trips. For Parcel FF, the proposed residential development will generate 499 net new daily trips, including 44 net AM peak

Table 5
Project Trip Generation

Size/Use	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Parcel 10R							
Proposed Uses							
400 Apartments	1,584	25	115	140	88	42	130
174 Boat Slips	502	7	15	22	9	15	24
	2,086	32	130	162	97	57	154
Existing Uses - Removed							
136 Apartments	539	8	39	47	30	14	44
184 Boat Slips	530	8	15	23	9	16	25
	1,069	16	54	70	39	30	69
Net New Trips (Parcel 10R)	***1,017***	***16***	***76***	***92***	***58***	***27***	***85***
Parcel FF							
Proposed Uses							
126 Apartments	499	8	36	44	28	13	41
Existing Uses - Removed							
None	0	0	0	0	0	0	0
Net New Trips (Parcel FF)	***499***	***8***	***36***	***44***	***28***	***13***	***41***
Parcel 9U							
Proposed Uses							
288 -Suite Hotel	1,538	63	54	117	46	56	102
1.46 Ac Public Park	50	0	0	0	0	0	0
	1,588	63	54	117	46	56	102
Existing Uses - Removed							
None	0	0	0	0	0	0	0
Net New Trips (Parcel 9U)	***1,588***	***63***	***54***	***117***	***46***	***56***	***102***
Total Net Trips (Parcels 10R, FF and 9U)	***3,104***	***87***	***166***	***253***	***132***	***96***	***228***

hour trips and 41 net PM peak hour trips. For Parcel 9U, the hotel/timeshare resort component will generate about 1,538 net new daily trips, including 117 new trips during the AM peak hour and 102 trips during the PM peak hour. The new public park on Parcel 9U is anticipated to result in approximately 50 new daily trips, although peak hour traffic for the park is expected to be nominal.

Trip Distribution

Determination of the geographic distribution of generated trips was the next step in the process. A primary factor affecting trip distribution is the relative distribution of employment, educational, and retail centers that would be used by the residents of the project, guests of the hotel/timeshare resort and persons using the boat slips. Another key factor is the availability of roadway access to and from the site. Data from the Los Angeles Regional Transportation Study (LARTS) forecasts, as well as information presented in the current Los Angeles County Congestion Management Plan (CMP), were analyzed in order to estimate regional traffic distribution. Lastly, actual vehicle turning movements in and around the project vicinity were observed, and general geographic trip distribution characteristics were developed. The percentage split of trips, by direction, is shown in Table 6.

Table 6
Directional Trip Distribution

Direction	Percentage of Trips
North	25%
East	35%
South	35%
West	5%
Total:	100%

Traffic Assignment

The general geographic trip distribution percentages shown in Table 6 were then assigned to specific travel routes in the study area. These assignment percentages are shown in Figure 4(a) for Parcel 10R, Figure 4(b) for Parcel FF and Figure 4(c) for Parcel 9U. These distribution percentages are assumed to be the same during both the AM and PM peak hours. Based on these directional distribution percentages, the number of trips along each roadway was calculated. The results of this traffic assignment provide the necessary level of detail to conduct the traffic analysis. The traffic assignments for the AM and PM peak hour project traffic on the nearby street system are shown in Figures 5(a) and 5(b), Net Total Project Traffic Volumes.

Project Access

Vehicular access for the proposed project would be provided along Marquesas Way and Via Marina. Primary access to the residential and boat slip parking facilities on Parcel 10R is proposed via multiple driveways located along the south side of Marquesas Way, with an additional access provided for the Via Marina fronting apartments on Parcel 10R via a new driveway on Via Marina. An opening in the median island on Via Marina currently exists at the approximate location of the new residential driveway. This median "cut" will allow access from the north to the Via Marina driveway provided for this portion of the project site. For the residential parking facilities on Parcel FF, primary access is proposed to be provided by multiple driveways located along the north side of Marquesas Way. For Parcel 9U, access to the proposed hotel/timeshare resort parking facility will be accessed via one new driveway along the site frontage of Via Marina. Currently, a median island exists on Via Marina at the location of the new hotel/timeshare resort driveway. The project proposes an opening in the median island on Via Marina in order to provide full left- and right-turn access and egress at the new driveway. In addition, two driveways located further to the north along Via Marina will serve the loading dock. The two service driveways are proposed to be restricted to "right-in/right-out" operation due to the raised median island on Via Marina.

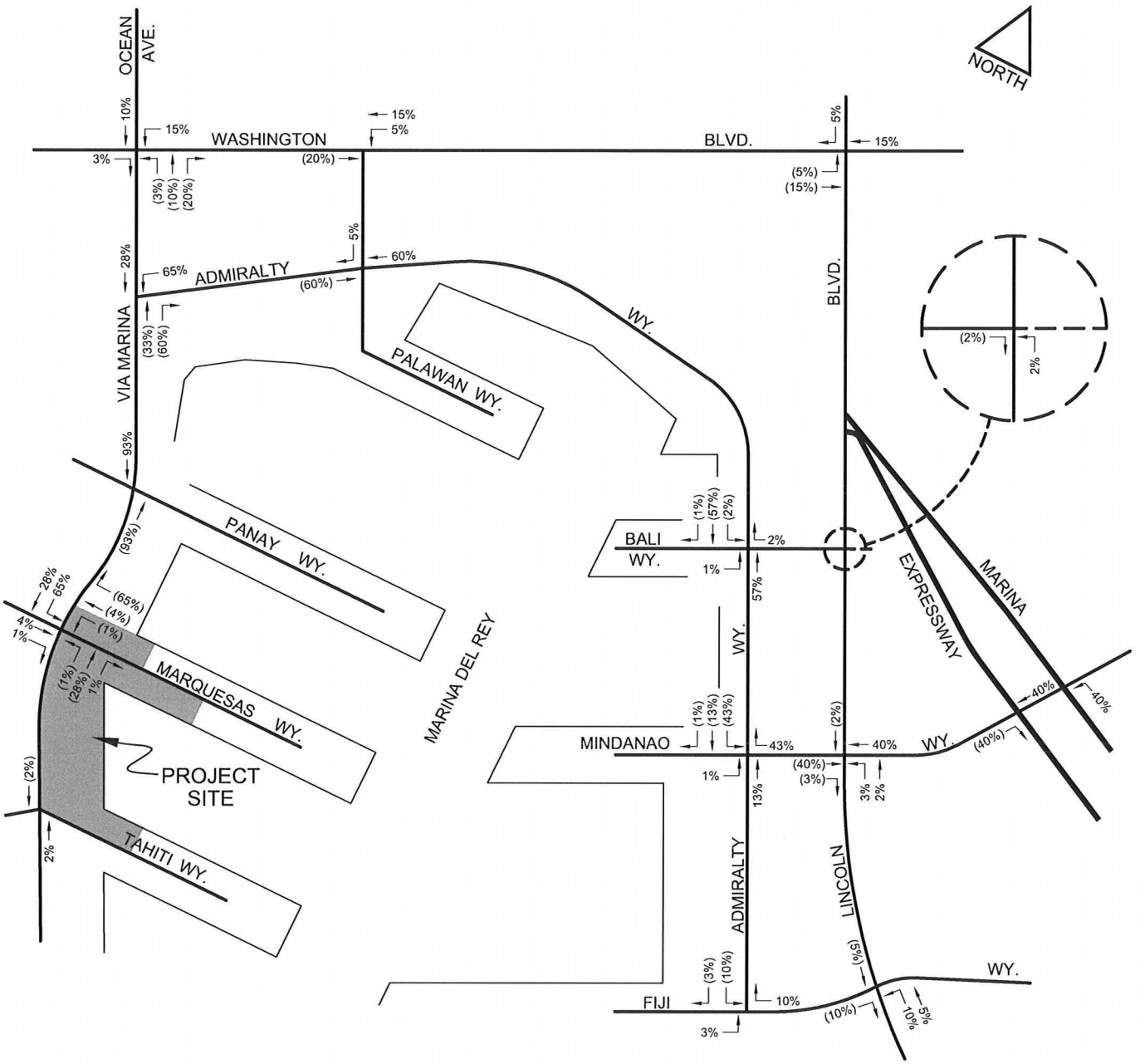

FIGURE 4(a)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\PROJ-DIST(10R)

PROJECT TRIP DISTRIBUTION PERCENTAGES
(PARCEL 10R)

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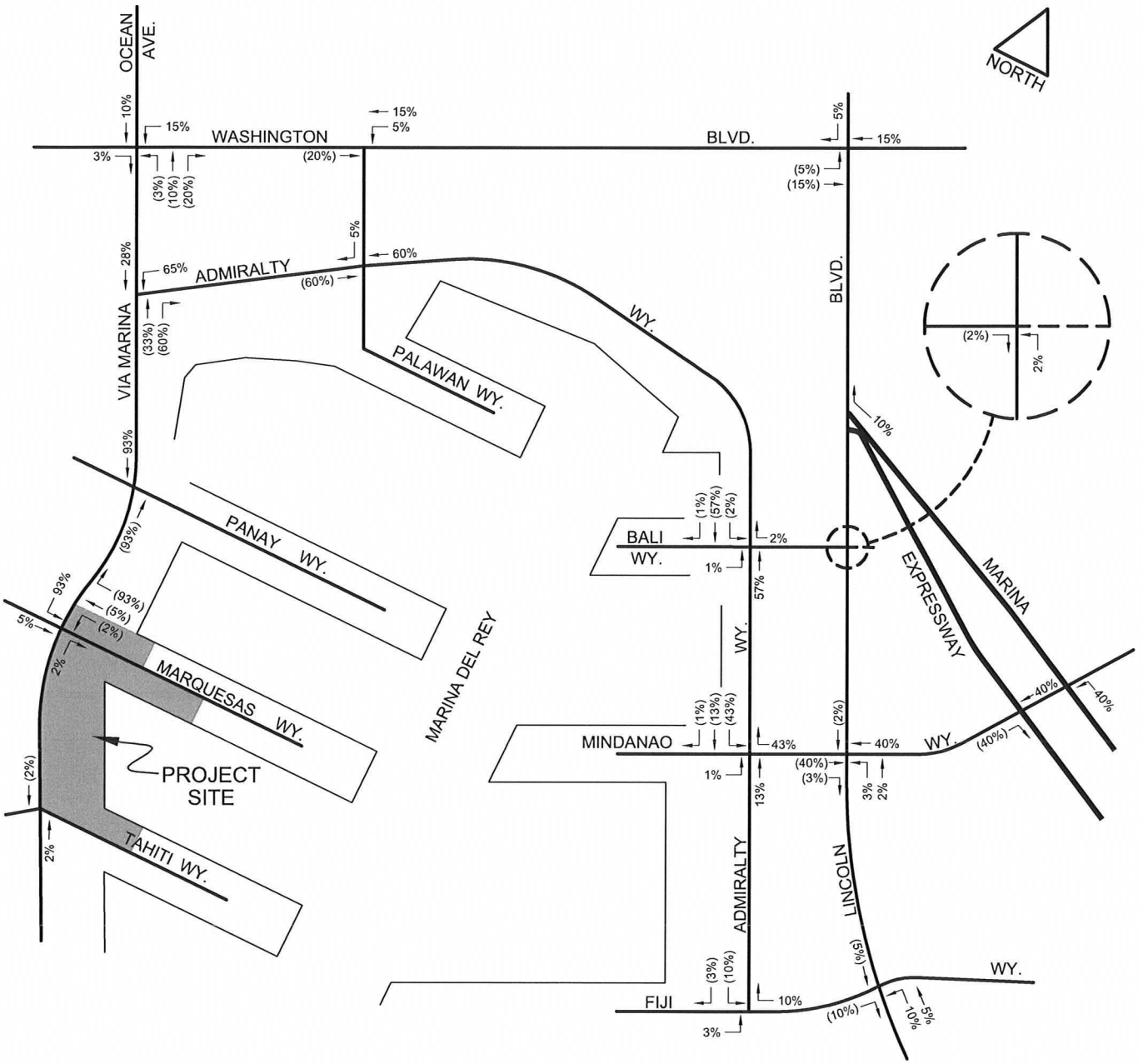

FIGURE 4(b)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\PROJ-DIST(FF)

PROJECT TRIP DISTRIBUTION PERCENTAGES
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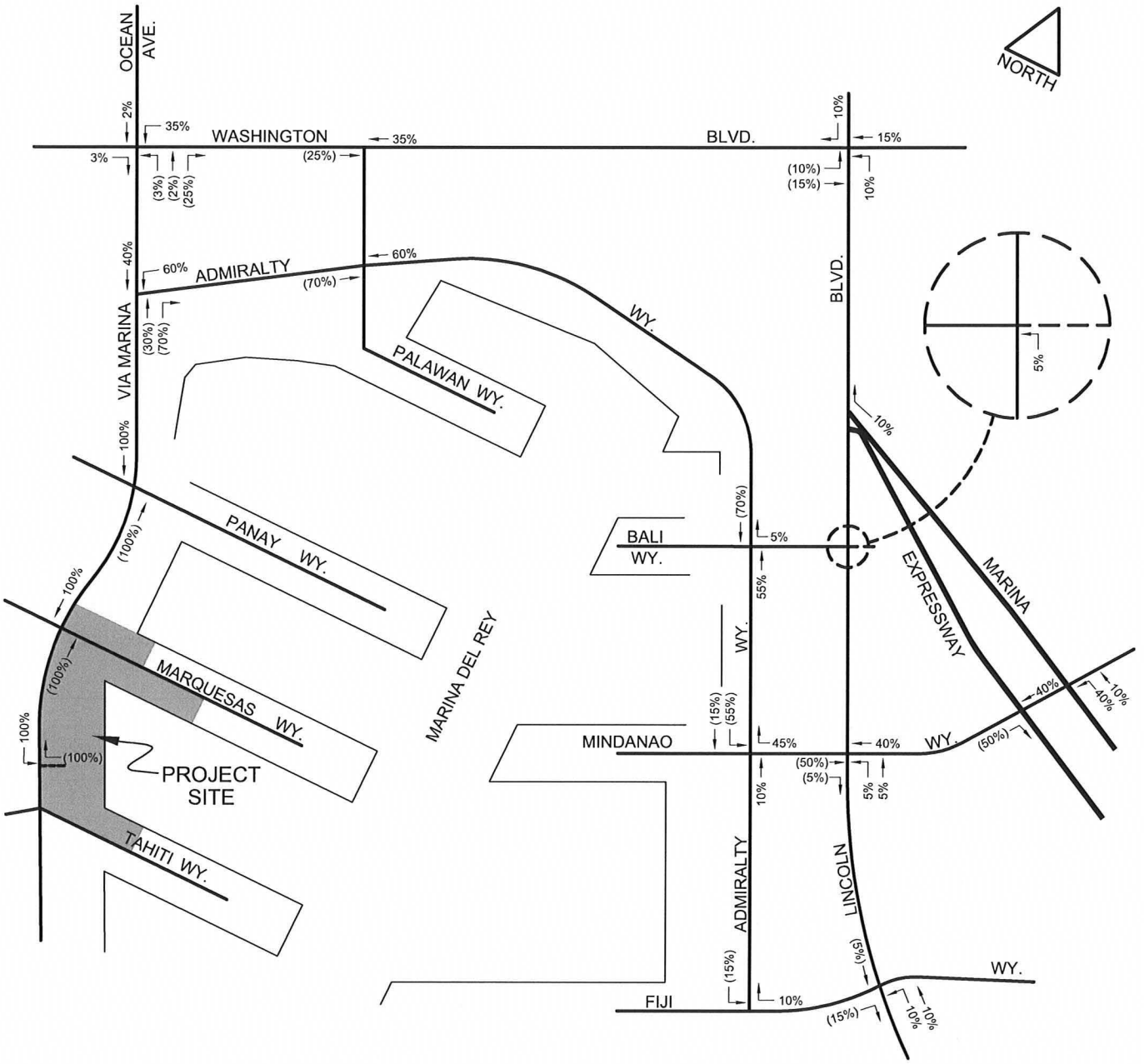

FIGURE 4(c)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\PROJ-DIST-(9U)

PROJECT TRIP DISTRIBUTION PERCENTAGES
(PARCEL 9U)

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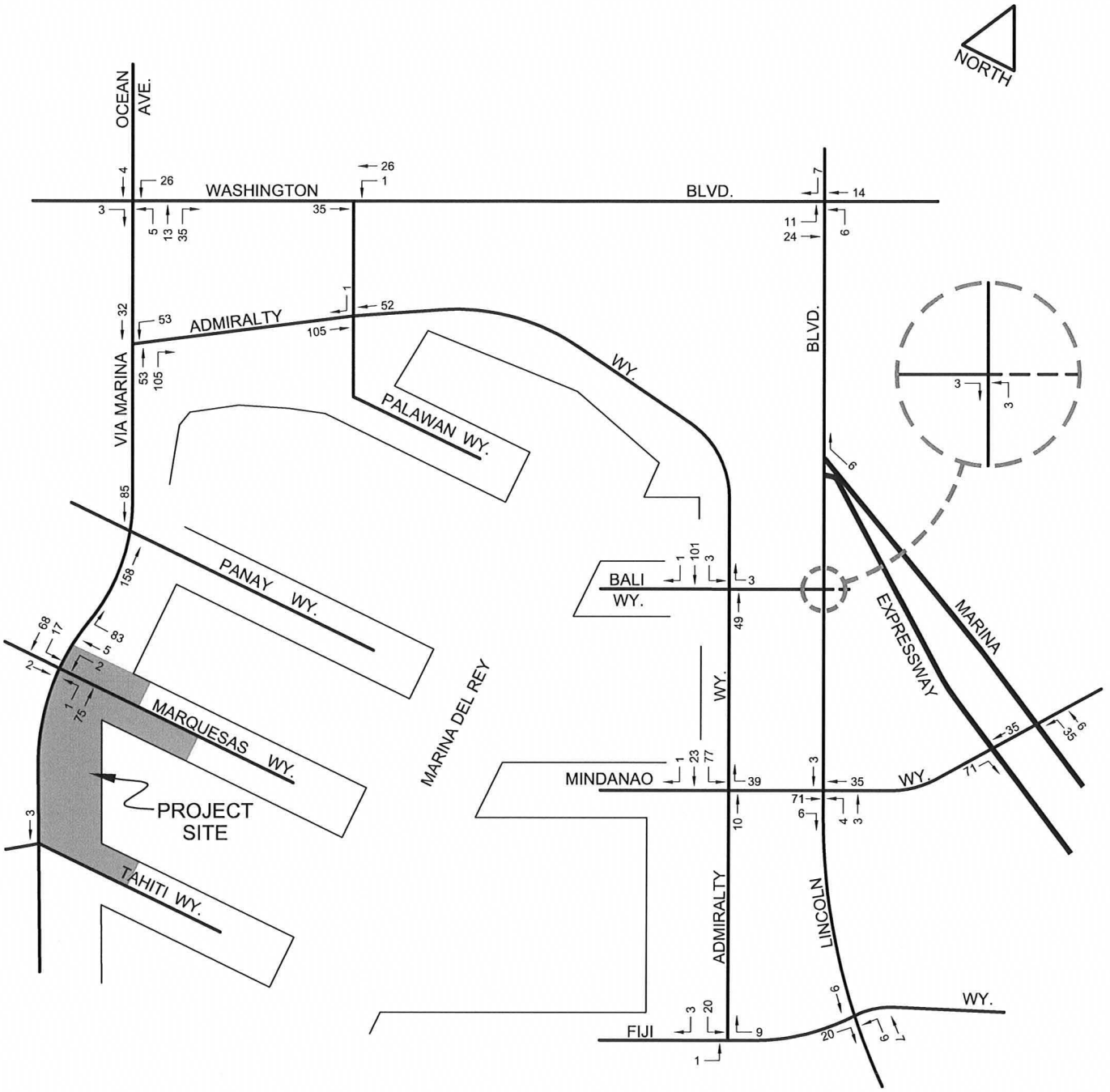

FIGURE 5(a)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\AMNETPRJ(10R,FF,9U)

NET TOTAL PROJECT TRAFFIC VOLUMES
(PARCELS 10R, FF AND 9U)
AM PEAK HOUR

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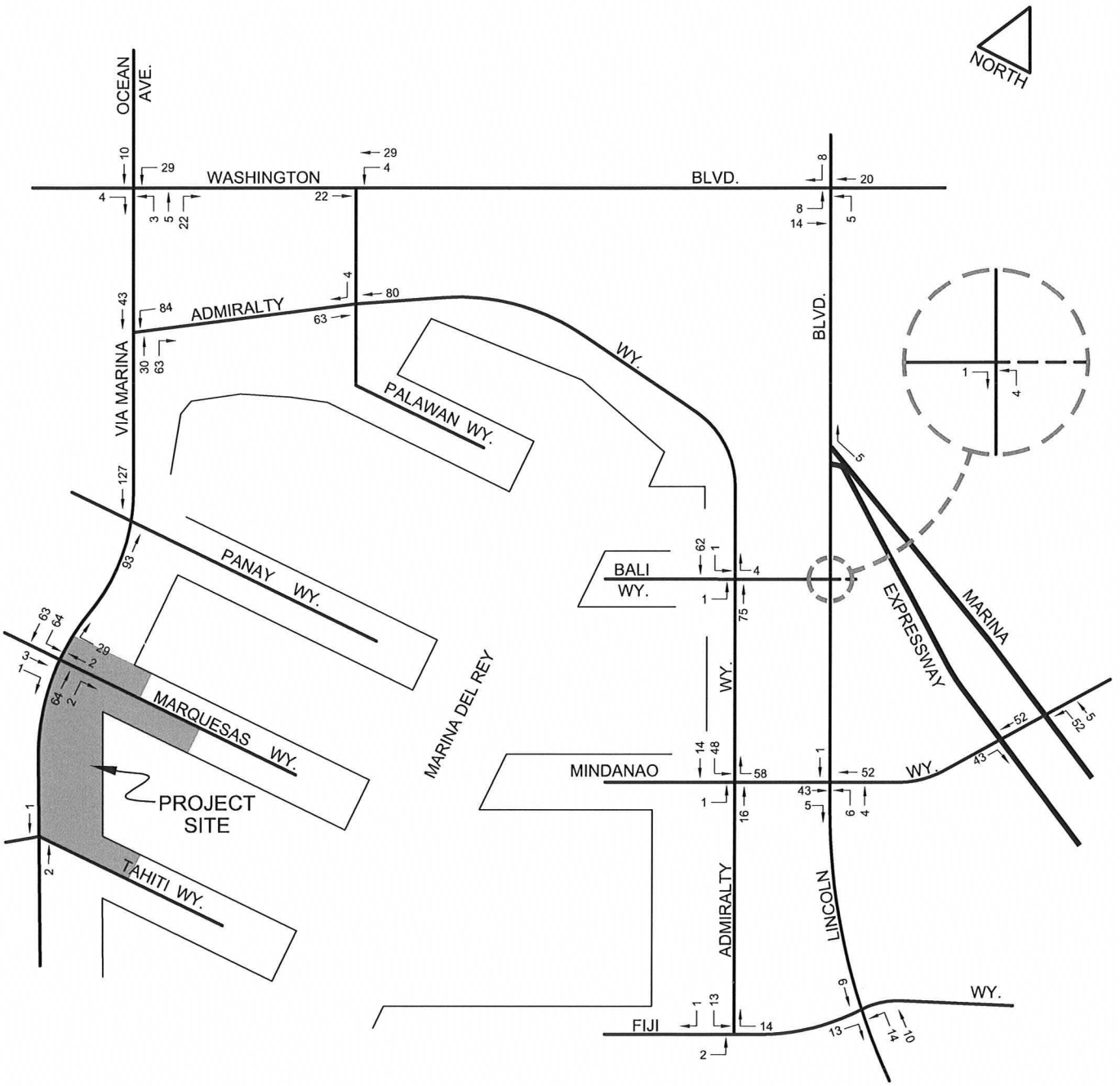

FIGURE 5(b)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\PMNETPRJ(10R,FF,9U)

NET TOTAL PROJECT TRAFFIC VOLUMES
(PARCELS 10R, FF AND 9U)
PM PEAK HOUR

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Project Parking

As described in the previous section, parking for the proposed project site (Parcels FF, 10R and 9U) is generally provided in parking structures beneath or adjacent to each building. The amount of parking required for the proposed project development on Parcels 10R, FF and 9U is summarized in Table 7.

As shown in Table 7(a), the proposed development on Parcel 10R will require a total of 777 parking spaces for the residents and guests of the 400 apartments, plus an additional 131 spaces for boat slip parking needs, for a total of 908 spaces. The project will provide a minimum of 908 spaces to meet the total amount of parking required for the Parcel 10R development. Table 7(b) shows that the residential development on Parcel FF will require a total of 242 parking spaces for the residents and guests of the 126 apartments. The project will provide about 242 parking spaces including a minimum of 32 guest parking spaces on Parcel FF in order to meet the total amount of parking required for this parcel. Since the proposed project developments on Parcels 10R and FF meet its parking requirements both on an overall basis and for each individual use, no parking spillover onto area streets or into the nearby neighborhoods is anticipated, and no parking-related impacts are expected as a result of the project components on these two parcels.

As summarized in Table 7(c), approximately 556 on-site parking spaces would be required for the proposed hotel/timeshare resort component on Parcel 9U if the resort's primary and accessory uses were analyzed as stand-alone facilities. However, stand-alone parking often does not reflect the true parking demand of a full-scale hotel development. Therefore, County Code allows for an analysis to be made of the project uses on a shared parking basis. A shared parking analysis, prepared using

Table 7(a)
County Code Parking Requirement Tabulation for Proposed Project Development on Parcel 10R

Site	Type of Unit	Number/Size of Units	Spaces Per Unit	Total
Parcel 10R	1 BR	246	1.50	369
	2 BR	154	2.00	308
				677
	Guests	400	0.25	100
				777
	Boat Slips	174 slips	0.75/slip	131
	Total Parking Required (Parcel 10R)			908
	Total Parking Provided (Parcel 10R)			908

Table 7(b)
County Code Parking Requirement Tabulation for Proposed Project Development on Parcel FF

Site	Type of Unit	Number/Size of Units	Spaces Per Unit	Total
Parcel FF	1 BR	84	1.50	126
	2 BR	42	2.00	84
				210
	Guests	126	0.25	32
	Total Parking Required (Parcel FF)			242
	Total Parking Provided (Parcel FF)			242

Table 7(c)
County Code Parking Requirement Tabulation for Proposed Project Development on Parcel 9U Assuming Stand-Alone Facilities

Proposed Project	Size	Parking Rate	Spaces Required
Hotel/Timeshare Resort	83 2-Bedrooms	1 / 1 Unit	83
	205 1-Bedroom	0.5 / 1 Unit	103
Sundry Shop	1,176 sf	4 / 1,000 sf	5
Spa (5,555 sf)	111 Occupants	1 / 3 Occupant	37
Ballroom (5,200 sf)	347 Occupants	1 / 3 Occupant	116
Meeting Room (3,400 sf)	227 Occupants	1 / 3 Occupant	76
Restaurant			
Customer Seating Area (3,140 sf)			
Outdoor Dining (1,840 sf)			
Bar Lounge (1,125 sf)			
Subtotal (6,105 sf)	407 Occupants	1 / 3 Occupant	136
Total Spaces Required on Parcel 9U Using Stand-alone Rates:			**556** [1]

[1] As noted above and shown in Appendix H, when shared-use considerations are included, the peak parking demand for the hotel/timeshare resort would be 345 spaces, resulting in 15 surplus spaces during the peak parking demand period.

Urban Land Institute (ULI) procedures as detailed in Appendix H, concludes that the maximum parking demand for the project site would be approximately 345 parking spaces and would occur between 9:00 PM and 10:00 PM on a typical summer weekend, with a slightly lower maximum parking demand of 344 spaces on a typical summer weekday. The proposed hotel/timeshare resort will accommodate a total of 360 spaces including 21 fee-based self-park spaces located on the second parking level and 339 valet spaces located on all other parking levels. Thus, no parking spillover onto area streets or into the nearby neighborhoods is anticipated, and no parking-related impacts are expected as a result of the proposed hotel/timeshare resort development on Parcel 9U.

FUTURE TRAFFIC CONDITIONS

Other developments in the study vicinity could add traffic to the project area. For this reason, the analysis of future traffic conditions has been expanded to include potential traffic from yet undeveloped or unoccupied projects. Briefly, the methodology for estimating future traffic volumes was as follows: First, current traffic volumes were determined by traffic counts (as described in a preceding section). Next, a traffic growth factor of 0.6 percent, compounded annually, was applied to the existing traffic volumes to produce "With Ambient Growth" traffic estimates for the future study year of 2013. The annual growth rate of 0.6 percent was assumed to be the growth rate for the study area and was agreed to with the County of Los Angeles Department of Public Works (DPW). The year 2013 was chosen as the study year, assuming the development will be constructed and fully occupied within this four-year time frame. Traffic expected to be generated by the proposed project, as calculated earlier in this report, was then added to the baseline traffic volumes to form the year 2013 "With Ambient Growth Plus Project" conditions, to determine any traffic effects directly attributable to the project's development. Finally, trips resulting from nearby "related projects" reasonably expected to be developed within the study timeline were analyzed as an incremental addition to the 2013 "With Ambient Growth Plus Project" scenario, to estimate the future "With Cumulative Project" traffic conditions.

Traffic Growth

Based on an analysis of the trends in traffic growth in this portion of the Los Angeles basin over the last several years, an annual traffic growth factor of 0.6 percent was determined to be applicable by the County of Los Angeles DPW. The growth factor was used to account for increases in traffic resulting from projects not yet proposed or outside of the study area. This growth factor, compounded annually, was applied to the 2007 traffic volumes to develop an estimate of 2013 baseline volumes.

Related Projects

In addition to the use of the 0.6 percent annual growth rate, listings of potential related projects located in the study area were obtained from the Los Angeles County Regional Planning Department, the City of Los Angeles Department of Transportation, and from the Cities of Santa Monica and Culver City. From a review of these lists, it was determined that traffic from 41 projects near the study site could produce additional traffic at the 17 study intersections. The locations of the related projects are shown in Figure 6.

A description and an estimate of the daily and peak hour traffic volumes expected to be generated by these related projects are summarized in Table 8. The trip-making estimates for the related projects are based on Coastal Transportation Corridor Specific Plan (CTCSP) PM trip rates, supplemented by data obtained from the ITE rates and equations, or from previously prepared traffic studies or other environmental documentation. Related project traffic was assigned to the area roadway system using a procedure identical to the methodology described previously for determining the proposed project's traffic assignments. Note that project number 17, Playa Vista Phase 1, is currently approximately 30 percent completed and occupied. Thus, a trip reduction of 30 percent was assumed for this related project when the related project trips were assigned to the network.

This cumulative impact analysis is inherently conservative in that it assumes that each of the related projects will be built out at full density and without any additional mitigation requirements. In fact, it is likely that at least some of these projects will not be built, others will be built at a lesser density than proposed, and most will be required to implement mitigation measures as part of the approval process.

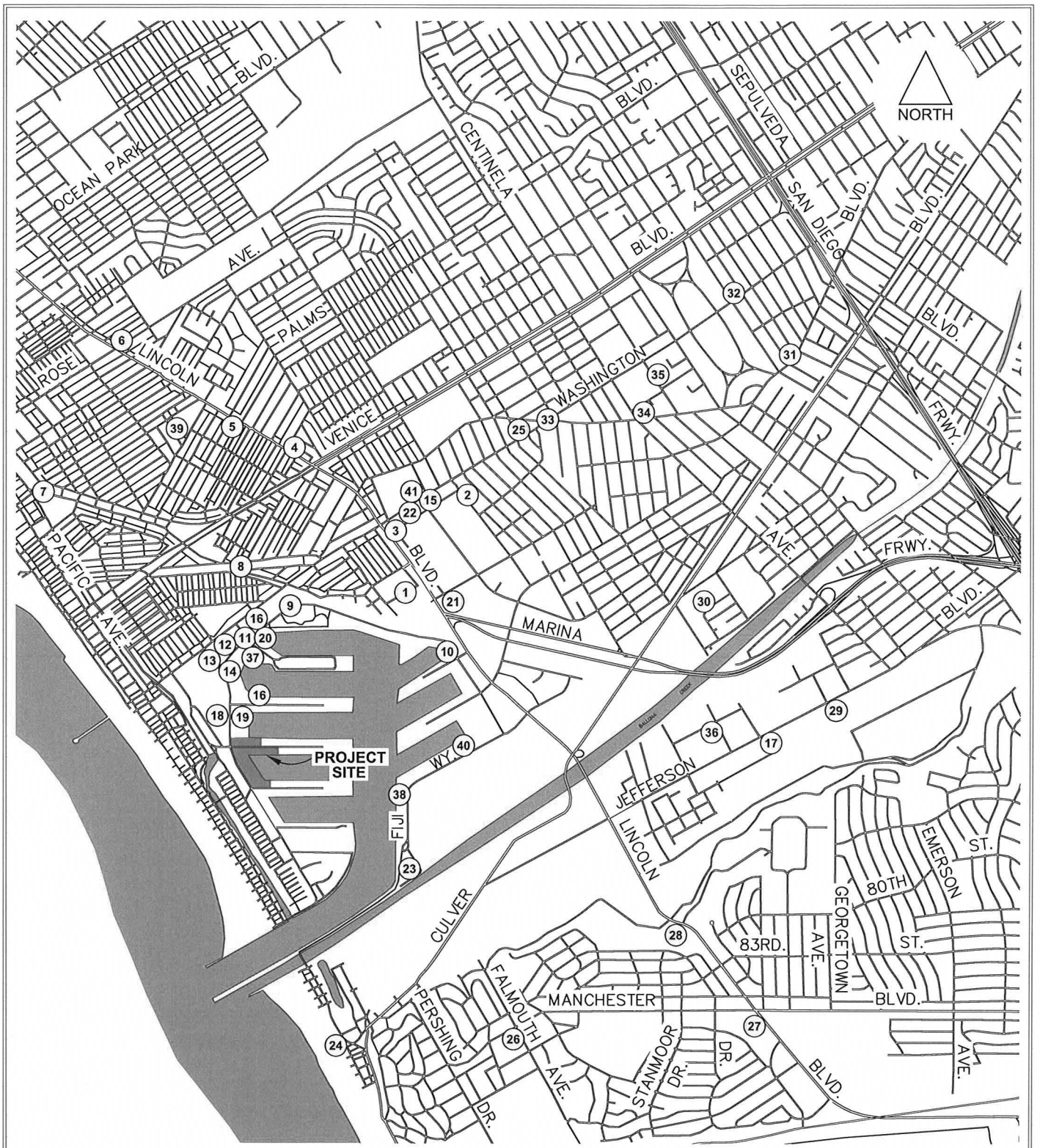

FIGURE 6

5/22/2007

FN: MARINA DEL REY LEGACY\REPORT(5-2007)\RELPROJS

RELATED PROJECTS LOCATION MAP

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Table 8
Related Projects Descriptions and Trip Generation

Map No.	Location (Address)	Size	Unit	Description	Daily	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out
1.	NWC Princeton Dr./Carter Av. [1]	298	du	Apartment	860	(70)	103	47	(79)
		(24,000)	*sf*	*Light Manufacturing (to be removed)*					
		(21,600)	*sf*	*Office (to be removed)*					
		(40,000)	*sf*	*Auto Service/Repair (to be removed)*					
2.	4055, 4063 & 4071 S. Redwood Av.	140	du	Condominium	820	11	51	66	32
3.	4004 S. Lincoln Bl.	98	du	Condominium	574	7	36	46	23
		6,020	sf	Retail	267	4	3	13	17
					841	**11**	**39**	**59**	**40**
4.	2005 Lincoln Bl.	6	vfp	Service Station w/ Convenience Store	977	30	30	11	11
5.	1430 Lincoln Bl.	188,600	sf	Retail	10,257	140	89	501	543
		280	du	Apartment	1,882	29	114	127	69
					12,139	**169**	**203**	**636**	**613**
6.	115 Lincoln Bl.	8,800	sf	Shopping Center (addition)	378	5	4	61	67
7.	901 Abbott Kinney Bl. [2]	57	rm	Hotel	757	19	11	33	24
		1,200	sf	Retail					
		4,300	sf	Restaurant					
8.	2100 Abbot Kinney Bl.	15,180	sf	Office	167	21	3	7	36
9.	4333 Admiralty Wy.	600	du	Condominium	3,516	45	219	133	63

Table 8 (continued)
Related Projects Descriptions and Trip Generation

Map No.	Location (Address)	Size	Unit	Description	Daily	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out
10.	4363 Lincoln Bl. [3]	158	du	Condominium	386	0	47	53	18
		3,178	sf	Specialty Retail					
		(48,000)	*sf*	*Car Rental Facility (to be removed)*					
11.	NWC Admiralty Wy./Palawan Wy. [4]	179	du	Apartment	650	11	51	34	24
	(Parcels 140)	*(64)*	*du*	*Apartment (to be removed)*	*(233)*	*(4)*	*(18)*	*(12)*	*(9)*
					417	**7**	**33**	**22**	**15**
12.	514-586 Washington Bl. [5]	6,236	sf	Retail	18	1	0	1	1
	bet. Via Marina/Palawan Wy.	*(5,750)*	*sf*	*Retail (to be removed)*					
	(Parcel 97)								
13.	S/s Washington Bl.	72	du	Apartment	1,360	23	42	77	58
	bet. Via Marina/Via Dolce	368	st	Restaurant					
	(Parcel 95) [6]	16,352	sf	Retail					
		7,888	sf	Office					
		(9,180)	*sf*	*Office (to be removed)*					
		(165)	*st*	*Restaurant (to be removed)*					
14.	S/s Admiralty Wy., E/s Via Marina	147	rm	Hotel	1,201	50	32	23	29
	(Parcel IR)								
15.	13340 Washington Bl.	41	du	Condominium	240	3	15	14	7
16.	E/o Palawan Wy., betw. Washington Bl./	114	du	Congregate Care Retirement Facility	387	5	5	20	21
	Admiralty Wy. (Parcel OT)	5,000	sf	Retail					
	N/s Panay Wy., E/o Via Marina	6,000	sf	Marine Commercial Office	(109)	4	(2)	(10)	(1)
	(Parcel 21) [7]	*(6,000)*	*sf*	*Health Club (to be removed)*					
					278	**9**	**3**	**10**	**20**

Table 8 (continued)
Related Projects Descriptions and Trip Generation

Map No.	Location (Address)	Size	Unit	Description	Daily	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out
17.	South of Jefferson Bl., E/o Lincoln Bl.	3,206,950	sf	Office	38,733	2,455	1,540	1,777	3,217
	(Playa Vista Phase I)	3,246	du	Condominium					
		35,000	sf	Retail					
		120,000	sf	Community Serving Uses					
18.	W/s Via Marina (Parcel 100 and 101) [8]	544	du	Apartment	2,154	34	156	120	57
		(202)	*du*	*Apartment (to be removed)*	*(1,354)*	*(13)*	*(57)*	*(45)*	*(21)*
					800	**21**	**99**	**75**	**36**
19.	E/s Via Marina	940	du	Apartment	1,785	31	140	106	46
	bet. Panay Wy./Marquesas Wy. [9]	82	du	Senior Apartment					
	(Parcels 12, 15)	4,000	sf	Retail					
		6,000	sf	Commercial					
		439	slip	Boat					
		(408)	*du*	*Apartment (to be removed)*					
		(10,000)	*sf*	*Retail (to be removed)*					
		(717)	*slip*	*Boat (to be removed)*					
20.	S/s Admiralty Wy., E/s Palawan Wy.	351	du	Apartment	2,359	36	143	78	36
	(Parcel 33/NR)	24,300	sf	Retail	1,077	17	12	46	62
		266	seat	Restaurant (10,000 sf)	761	4	4	45	22
		(1,067)	*seat*	*Restaurant (to be removed)*	*(3,052)*	*(17)*	*(15)*	*(179)*	*(88)*
					1,145	**40**	**144**	**(10)**	**32**
21.	E/o Lincoln Bl. Betw. SR90 & Maxella Av. [10]			Villa Marina Mixed-Use Project	903	11	84	73	10
		244	du	Condominium					
		9,000	sf	Shopping Center					
		(21,038)	*sf*	*Shopping Center (to be removed)*					

Table 8 (continued)
Related Projects Descriptions and Trip Generation

Map No.	Location (Address)	Size	Unit	Description	Daily	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out
22.	13464 W. Washington Bl. [11]	81	du	Condominium	1,401	11	32	83	75
		37,041	sf	Retail					
		(22)	*rm*	*Motel (to be removed)*					
		(7,525)	*sf*	*Retail (to be removed)*					
		(8,500)	*sf*	*Industrial (to be removed)*					
23.	Southern terminus of Fiji Wy. (Parcel 64) [12]	478	du	Multi-family Residential	1,106	17	76	58	30
		500	sf	Restaurant					
		34	slip	Boat					
		(224)	*du*	*Apartment (to be removed)*					
24.	NWC Pacific Av./Culver Bl. [13]	35	du	Townhome	548	16	24	34	22
		2,000	sf	Retail					
		2,000	sf	Restaurant					
25.	12801-23 Washington Bl.	12	du	Live/Work	81	1	5	5	2
		12	du	Apartment	81	1	5	5	2
					162	**2**	**10**	**10**	**4**
26.	8030-8040 Manchester Av.	204	du	Apartment	1,371	21	83	93	50
27.	8601 Lincoln Bl. [14]	547	du	Apartment	905	(128)	136	124	(10)
		17,000	sf	Shopping Center					
		4,000	sf	Retail					
		5,000	sf	High-Turnover Restaurant					
		3,000	sf	Quality Restaurant					
		(500)	*rm*	*Hotel (to be removed)*					
		(10,420)	*sf*	*Retail (to be removed)*					
		(10,590)	*sf*	*Office (to be removed)*					
		(4,800)	*sf*	*High-Turnover Restaurant (to be removed)*					

Table 8 (continued)
Related Projects Descriptions and Trip Generation

Map No.	Location (Address)	Size	Unit	Description	Daily	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out
28.	7400 80th St. [15]	120	du	Single-Family Residential	1,220	25	70	82	46
29.	South of the intersection of Jefferson Bl./ Westlawn Av. [16]	175,000	sf	Office	24,220	577	1,049	1,275	1,027
		2,600	du	Apartment					
		150,000	sf	Retail					
		40,000	sf	Community Serving Uses					
30.	12700 Braddock Dr.	134,557	sf	Warehouse	667	50	11	54	161
		1,357	sf	Office	15	2	0	1	3
		(58,323)	*sf*	*University of CA laundry building (to be removed)*	*(223)*	*(33)*	*(10)*	*(17)*	*(30)*
					459	**19**	**1**	**38**	**134**
31.	11501-11509 Washington Bl.	2	du	Apartment	13	0	1	1	0
		950	sf	Office	37	4	1	14	66
		2,359	sf	Retail	105	2	1	3	3
					155	**6**	**3**	**18**	**69**
32.	11611 Washington Pl.	20	du	Senior Day Care Facility (9,970 sf)	43	1	0	2	1
		(9,970)	*sf*	*Furniture manufacturing/warehouse (to be removed)*	*(38)*	*(5)*	*(2)*	*(3)*	*(4)*
					5	**(4)**	**(2)**	**(1)**	**(3)**
33.	4025 Wade St.	4	du	Condominium	23	0	2	2	1
34.	12337-12449 Washington Bl.			Phase A					
		12,070	sf	Commercial	535	8	6	15	18
		60	du	Condominium	352	4	22	21	10
				Phase B					
		3,890	sf	Commercial	172	3	2	5	6
		18	du	Condominium	105	1	7	6	3
					1,164	**16**	**37**	**47**	**37**

Table 8 (continued)
Related Projects Descriptions and Trip Generation

Map No.	Location (Address)	Size	Unit	Description	Daily	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out
35.	4061 Grand View Bl.	70	du	Assisted Living Facility	151	2	2	7	5
36.	5401 Beethoven St.	420	st	Private School (K-8)	N/A	208	170	120	136
37.	SWC Admiralty Wy. & Palawan Wy.	111	rm	Hotel	907	38	24	18	21
	(Parcel 27)	*(42)*	*rm*	*Hotel (to be removed)*	(343)	(15)	(9)	(7)	(8)
					564	**23**	**15**	**11**	**13**
38.	West of Fiji Wy. Near Terminus -	132	rm	Hotel	2,375	41	57	114	95
	Fisherman's Village [17]	1,230	seat	Restaurant					
	(Parcels 55/56/W)	24,250	sf	Retail					
		5,200	sf	Office					
		26	slip	Boat					
		(12,984)	*sf*	*Retail/Commercial (to be removed)*					
		(16,149)	*sf*	*Restaurant (to be removed)*					
		(17)	*slip*	*Boat (to be removed)*					
39.	841 California Ave.	420	st	High School	718	119	53	28	31
40.	N/s Fiji Wy., W/o Admiralty Wy.	345	Vessel	Dry Stack Storage Facility	995	15	28	17	30
	(Parcel 52/GG)	30	Vessel	Mast Up Storage Space	86	1	3	1	3
		1,500	sf	Sheriff Boatwright Facility	-	-	-	-	-
					1,081	**16**	**31**	**18**	**33**

Table 8 (continued)
Related Projects Descriptions and Trip Generation

Map No.	Location (Address)	Size	Unit	Description	Daily	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out
41.	13365 Washington Boulevard	5,000	sf	Retail	222	4	2	6	8
		19	du	Condominium	111	1	7	7	3
					333	**5**	**9**	**13**	**11**

Sources:

[1] Traffic Analysis for a Proposed 298-unit Residential Development on Princeton Drive in the Oxford Triangle Neighborhood of the City of Los Angeles, Crain & Associates, Revised January 2004.

[2] Los Angeles Department of Transportation Traffic Study Memorandum of Understanding (MOU), The Ambrose Hotel, Crain & Associates, April 17, 2006.

[3] Los Angeles Department of Transportation Scoping for Traffic Study for Marina del Rey Mixed-Use Platt Project, Crain & Associates, May 22, 2006.

[4] Traffic Analysis for a Proposed 179-unit Residential Development at 4160 Admiralty Way (Parcels 140) in Marina del Rey, Crain & Associates, September 2003.

[5] Traffic Analysis for 6,236 sf Retail Development at 514-586 Washington Boulevard, between Via Marina and Palawan Way, in Marina del Rey, Crain & Associates, November 2002.

[6] Preliminary Trip Generation Estimates for Parcel 95 Project, Hirsch Green Traffic Consultant, April 2007.

[7] Traffic Analysis for the Proposed 114-Unit Congregate-Care Retirement Facility and 5,000 sf Retail on Parcel OT and the Holiday Harbor Courts Project on Parcel 21 in Marina del Rey, Crain & Associates, January 2007.

[8] Traffic Analysis for a Proposed 544-unit Residential Development on Parcels 100 and 101 in Marina del Rey, Crain & Associates, August 2005.

[9] Source: County of Los Angeles, Trip Generation By Development Project Summary Table.

[10] Final EIR for The Villa Marina Mixed-Use Project, PCR Services Corporation, March 2005.

[11] Los Angeles Department of Transportation Scoping for Traffic Study for Washington & Glencoe Mixed-use Project, Crain & Associates, October 10, 2006.

[12] Traffic Analysis for a Proposed 478-unit Residential Development on Parcel 64 in Marina del Rey, Crain & Associates, January 2007.

[13] Traffic Analysis for Proposed Mixed-Use Development at Pacific Avenue and Culver Boulevard, Playa del Rey, City of Los Angeles, Crain & Associates, November 2004.

[14] Traffic Impact Study for Residential Mixed-Use Project at Lincoln Boulevard/Manchester Avenue (8601 Lincoln Boulevard), City of Los Angeles, Crain & Associates, November 2002.

[15] Traffic Analysis for 120-unit Single-Family Residential Development Located on 80th Street in the City of Los Angeles, Crain & Associates, January 1998.

[16] Traffic Analysis for The Village at Playa Vista Project, Kaku Associates, Inc. and Raju Associates, Inc., July 2003.

[17] Traffic Study for the Fisherman's Village Retail and Commercial Development Project, Hirsch Green Traffic Consultant, March 2007.

Highway System Improvements

No significant highway improvements in the project area, other than some of the improvements listed as cumulative mitigation, were identified by either the County or City of Los Angeles as on-going or likely to be completed within the year 2013 project development timeline. Therefore, for purposes of analysis of the future traffic conditions, as discussed in the following section, no improvements to the existing roadway system in the study area were assumed. This assumption results in a "worst case" analysis, and more readily identifies locations where improvements should be made in order to provide sufficient roadway capacity to accommodate project traffic.

Analysis of Future Traffic Conditions (With and Without Project)

The analysis of future conditions in the project area was performed using the same critical movement analysis procedures described previously. For future project conditions, the roadway system was considered to have no improvements beyond existing conditions.

Traffic volumes used in the analysis of future year conditions were developed as follows:

- As described earlier in the report, future-year traffic volumes for the project vicinity were determined by applying a 0.6 percent per year ambient growth factor to the 2007 traffic volumes, to estimate area traffic growth.
- Traffic volumes generated by the project were combined with these benchmark "Without Project (With Ambient Growth Only)" volumes to form the "With Ambient Growth Plus Project" traffic conditions, and to determine traffic impacts directly attributable to the proposed development.
- Finally, traffic generated by the 41 identified related projects was added to the "With Ambient Growth Plus Project" traffic volumes described above, to

produce an estimate of the potential future cumulative traffic conditions within the study area.

It should be noted that the removal of the existing public parking lot on Parcel FF in anticipation of the proposed project would result in a nominal shift of traffic in the study area. The existing Parcel FF lot currently has an average parking utilization of approximately 23.4 vehicles per day, or about 47 daily trips. The average parking utilization includes both weekday and weekend usage. The number of trips during the peak-hour study periods on an average weekday is estimated to be less than five trips, since the parking utilization is lower on the weekdays compared to the weekends. Thus, any traffic shift from the Parcel FF public lot to other nearby parking facilities would only slightly impact several local intersections and did not need to be separately accounted for in this analysis.

The 2013 baseline "Without Project (With Ambient Growth Only)" AM and PM peak hour traffic volumes are shown in Figures 7(a) and 7(b), respectively. Future year 2013 "With Ambient Growth Plus Project" traffic volumes are shown in Figures 8(a) and 8(b) for the AM and PM peak hours, respectively. The results of the Critical Movement Analysis for future traffic conditions at the study intersections are summarized in Table 9.

The County of Los Angeles defines a significant traffic impact based on a "stepped scale" as defined in the "Traffic Impact Analysis Report Guidelines" prepared by the Department of Public Works.[4] The impact definition recognizes that intersections at high volume-to-capacity ratios are more sensitive to additional traffic than those operating with available surplus capacity. A significant impact is identified as an increase in the CMA value of 0.010 or more, when the final ("With Project") Level of

[4] Traffic Impact Analysis Report Guidelines, County of Los Angeles Department of Public Works "Traffic Impact Analysis Report Guidelines", January 1, 1997.

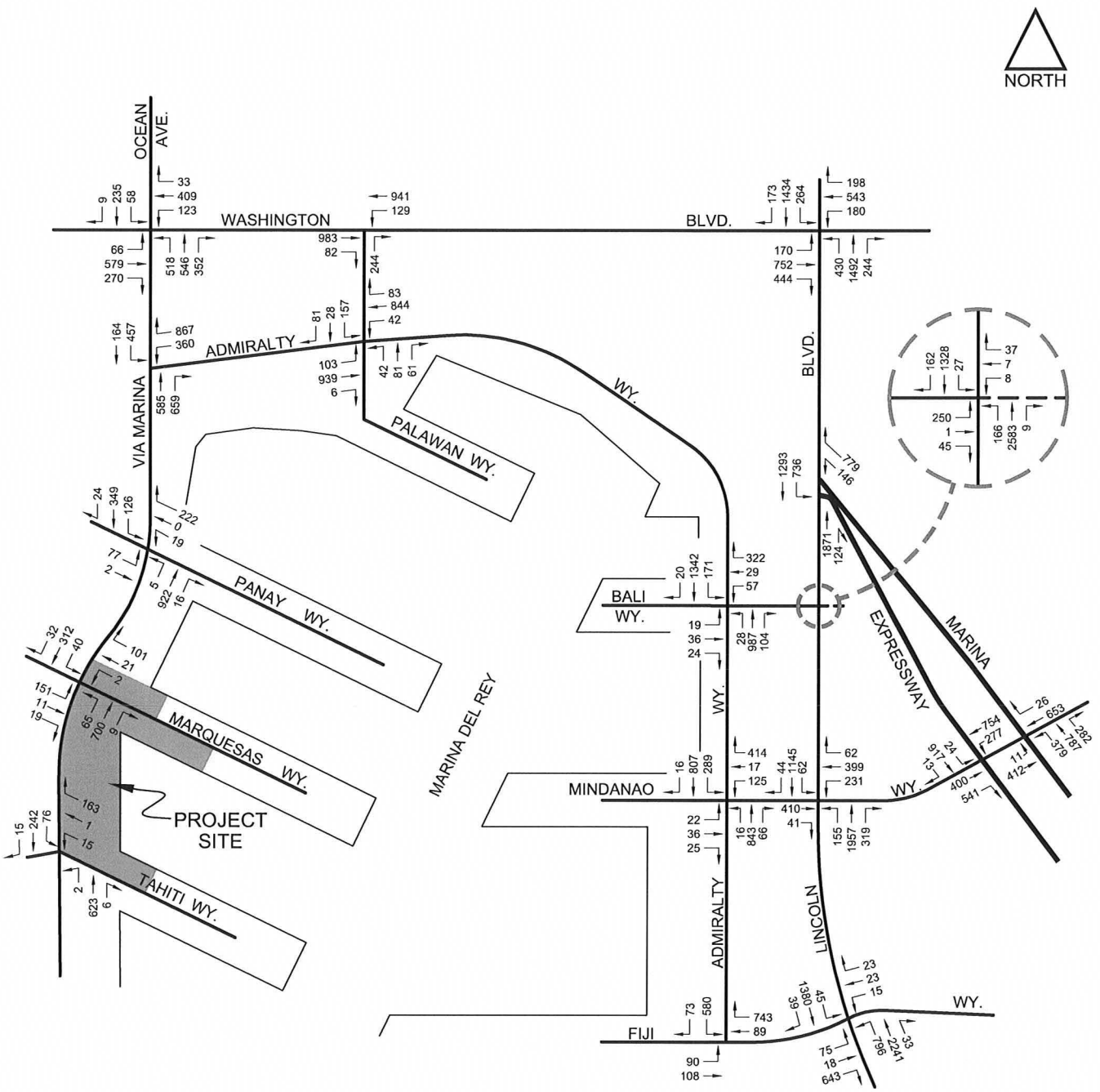

FIGURE 7(a)

12/3/2007

Marina del Rey Legacy\REPORT(12-2007)\AM2013WO

FUTURE (2013) TRAFFIC VOLUMES
WITHOUT PROJECT (WITH AMBIENT GROWTH ONLY)
AM PEAK HOUR

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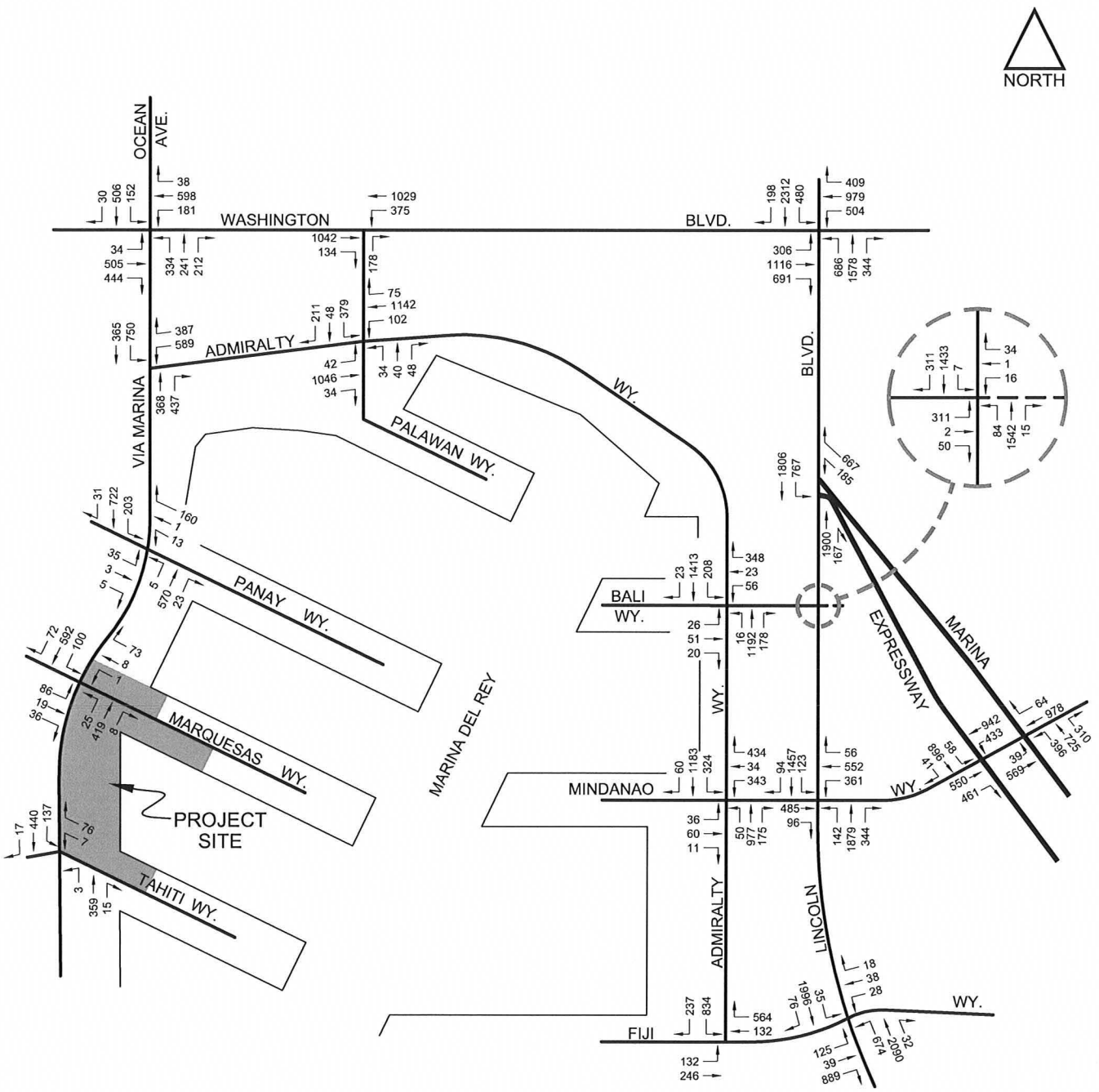

FIGURE 7(b)

12/3/2007

Marina del Rey Legacy\REPORT(12-2007)\PM2013WO

FUTURE (2013) TRAFFIC VOLUMES
WITHOUT PROJECT (WITH AMBIENT GROWTH ONLY)
PM PEAK HOUR

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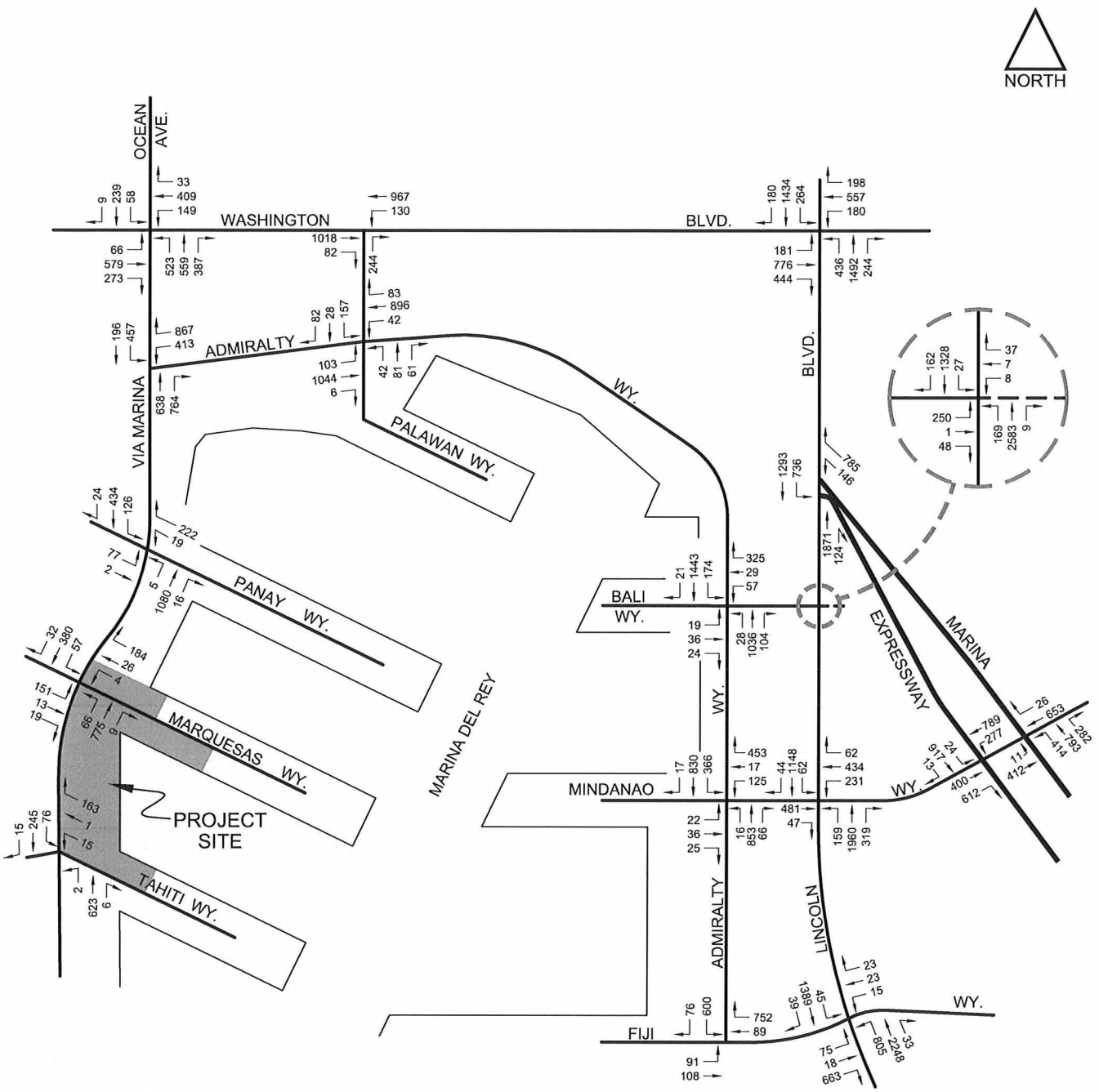

FIGURE 8(a)

12/3/2007

Marina del Rey Legacy\REPORT(12-2007)\AM2013WP(10R,FF,9U)

FUTURE (2013) TRAFFIC VOLUMES
WITH AMBIENT GROWTH PLUS PROJECT
(PARCELS 10R,FF,9U)
AM PEAK HOUR

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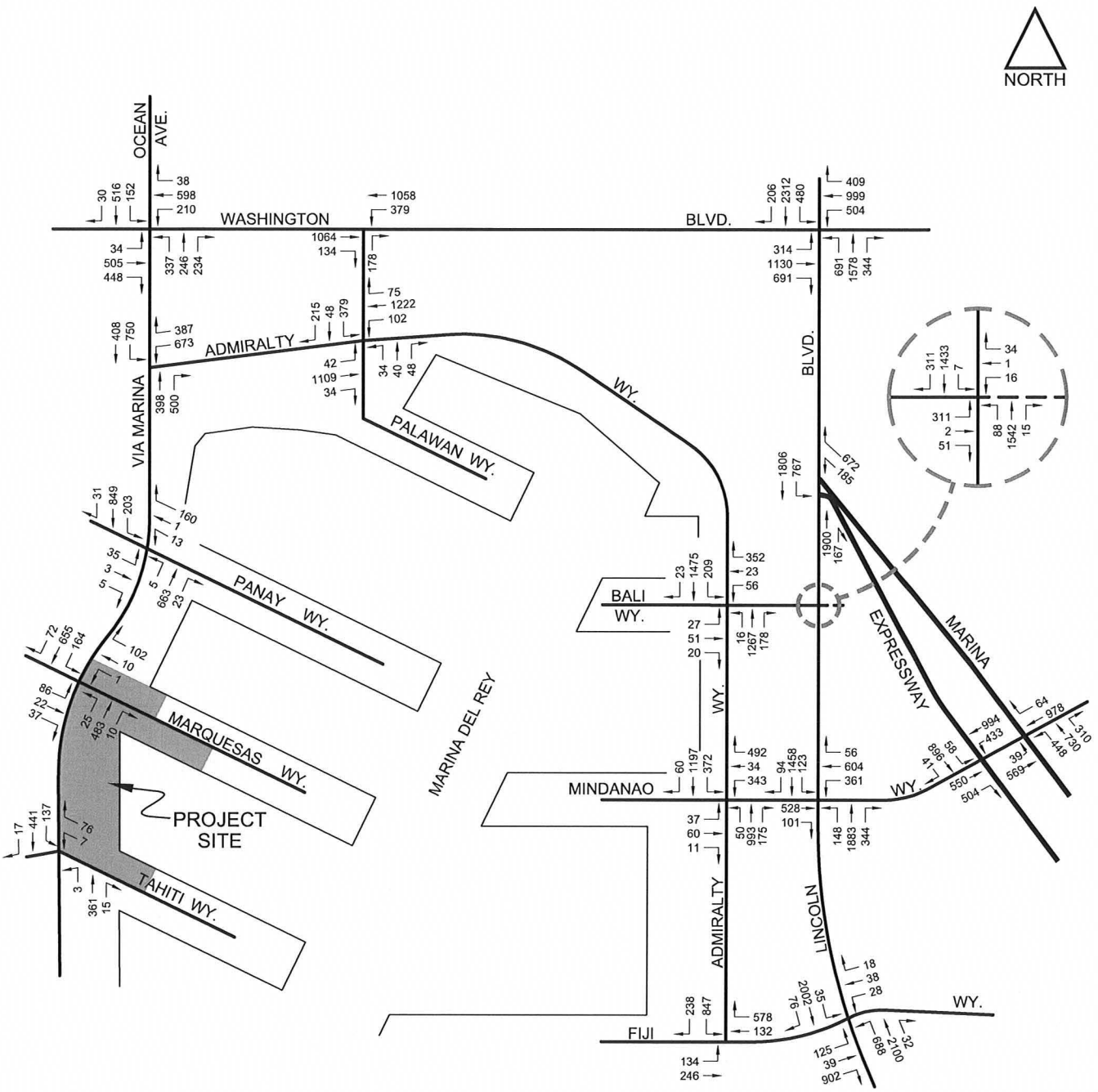

FIGURE 8(b)

12/3/2007

Marina del Rey Legacy\REPORT(12-2007)\PM2013WP(10R,FF,9U)

FUTURE (2013) TRAFFIC VOLUMES
WITH AMBIENT GROWTH PLUS PROJECT
(PARCELS 10R,FF,9U)
PM PEAK HOUR

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Table 9
Critical Movement Analysis (CMA) Summary
Future (2013) Ambient Growth Traffic Conditions – Without and With Project

No.	Intersection	Peak Hour	With Ambient Growth CMA	With Ambient Growth LOS	With Ambient Growth Plus Project CMA	With Ambient Growth Plus Project LOS	Impact	
1	Tahiti Way and	AM	0.276	A	0.276	A	0.000	
	Via Marina	PM	0.179	A	0.180	A	0.001	
2	Marquesas Way and	AM	0.271	A	0.333	A	0.062	
	Via Marina	PM	0.188	A	0.231	A	0.043	
3	Panay Way and	AM	0.360	A	0.388	A	0.028	
	Via Marina	PM	0.263	A	0.280	A	0.017	
4	Admiralty Way and	AM	0.730	C	0.749	C	0.019	
	Via Marina	PM	0.783	C	0.826	D	0.043	*
5	Washington Boulevard and	AM	0.744	C	0.774	C	0.030	
	Via Marina/Ocean Avenue	PM	0.799	C	0.831	D	0.032	*
6	Admiralty Way and	AM	0.444	A	0.461	A	0.017	
	Palawan Way	PM	0.629	B	0.655	B	0.026	
7	Washington Boulevard and	AM	0.668	B	0.682	B	0.014	
	Palawan Way	PM	0.747	C	0.759	C	0.012	
8	Washington Boulevard and	AM	0.807	D	0.820	D	0.013	
	Lincoln Boulevard	PM	1.390	F	1.399	F	0.009	
9	Lincoln Boulevard and	AM	0.707	C	0.707	C	0.000	
	Marina Expressway (SR-90)	PM	0.751	C	0.751	C	0.000	
10	Lincoln Boulevard and	AM	0.677	B	0.677	B	0.000	
	Bali Way	PM	0.534	A	0.537	A	0.003	
11	Lincoln Boulevard and	AM	0.754	C	0.782	C	0.028	
	Mindanao Way	PM	0.884	D	0.901	E	0.017	*
12	Lincoln Boulevard and	AM	0.613	B	0.619	B	0.006	
	Fiji Way	PM	0.762	C	0.769	C	0.007	
13	Admiralty Way and	AM	0.480	A	0.510	A	0.030	
	Bali Way	PM	0.602	B	0.631	B	0.029	
14	Admiralty Way and	AM	0.654	B	0.712	C	0.058	*
	Mindanao Way	PM	0.772	C	0.835	D	0.063	*
15	Admiralty Way and	AM	0.266	A	0.272	A	0.006	
	Fiji Way	PM	0.386	A	0.390	A	0.004	
16	Marina Expressway (SR-90)	AM	0.423	A	0.428	A	0.005	
	Westbound and Mindanao Way	PM	0.555	A	0.569	A	0.014	
17	Marina Expressway (SR-90)	AM	0.641	B	0.657	B	0.016	
	Eastbound and Mindanao Way	PM	0.769	C	0.779	C	0.010	

* Indicates significant project traffic impact, prior to mitigation (per Los Angeles County Department of Public Works "Traffic Impact Analysis Report Guidelines", January 1, 1997.

Service is E or F (CMA > 0.900); a CMA increase of 0.020 or more at LOS D (CMA > 0.800 to 0.900), or an increase of 0.040 or more at LOS C (CMA > 0.700 to 0.800).

County of Los Angeles Criteria for Significant Traffic Impact

LOS	Final CMA Value	Project-Related Increase in CMA Value
C	0.700 - 0.800	equal to or greater than 0.040
D	> 0.800 - 0.900	equal to or greater than 0.020
E, F	> 0.900	equal to or greater than 0.010

As shown in Table 9, the project is expected to result in four significant traffic impacts prior to mitigation, Via Marina and Admiralty Way, Washington Boulevard and Via Marina/Ocean Avenue, and Lincoln Boulevard and Mindanao Way during the PM peak-hour, and at Admiralty Way and Mindanao Way during both peak-hours. Measures to address these impacts are described in a later section in this report.

Cumulative Impacts

Traffic resulting from the previously identified 41 related projects would also contribute to impacts at the study intersections. In order to gauge the effects of this additional traffic, an additional level of analysis was conducted. Although the 0.6 percent annual growth factor is expected to fully represent all area traffic increases, for the purposes of conservative analysis, traffic generated from nearby "related projects" was added to the future "With Ambient Growth Plus Project" traffic volumes, to form the basis for the "With Cumulative Development" conditions.

Figures 9(a) and 9(b) show the anticipated AM and PM peak hour traffic at the study intersections resulting from the expected related projects in the study area. The related project traffic volumes were added to the "With Ambient Growth Plus Project" traffic conditions shown previously in Figures 8(a) and 8(b) to obtain projections of the ultimate expected future year 2013 traffic. These cumulative traffic volumes are shown in

Figures 10(a) and 10(b) for the AM and PM peak hours, respectively. The analysis of the cumulative traffic conditions was performed using the same CMA methodology described earlier.

The results of the cumulative development analysis are summarized in Table 10. This table shows the impact for the cumulative development including the project. The same criteria that was applied to the project impact is applied to the cumulative impact. As this table also shows, the potential additional traffic resulting from area-wide development would significantly impact 12 of the 17 study intersections, resulting in some locations near or above capacity. The proposed project will also contribute incrementally to these cumulative impacts, as shown in Table 10.

Impacts on the Regional Transportation System

To address the increasing public concern that traffic congestion was impacting the quality of life and economic vitality of the State of California, the Congestion Management Program (CMP) was enacted by Proposition 111. The intent of the CMP is to provide the analytical basis for transportation decisions through the State Transportation Improvement Program (STIP) process. A Countywide approach has been established by the Metropolitan Transportation Authority, the Local CMP agency, to implement the statutory requirements of the CMP. The Countywide approach includes designating a highway network that includes all state highways and arterials with the County and monitoring the network's level of service standards. This monitoring of the CMP network is one of the responsibilities of local jurisdictions. If level of service standards deteriorate, then local jurisdictions must prepare a deficiency plan to be in conformance with the Countywide plan.

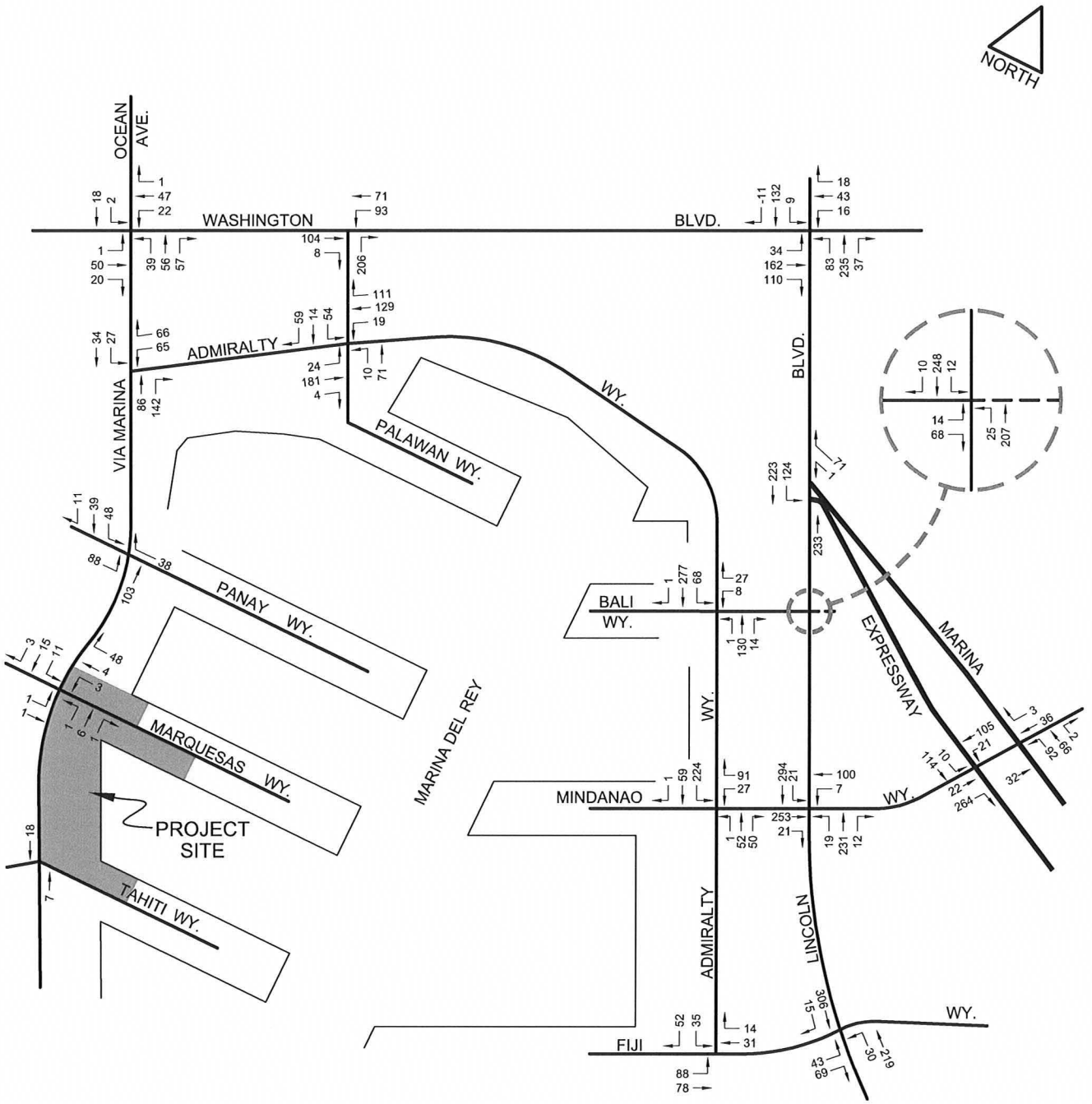

FIGURE 9(a)

5/22/2007

Marina del Rey Legacy\REPORT (5-2007)\AMRELPRJ

STICK

RELATED PROJECT TRAFFIC VOLUMES
AM PEAK HOUR

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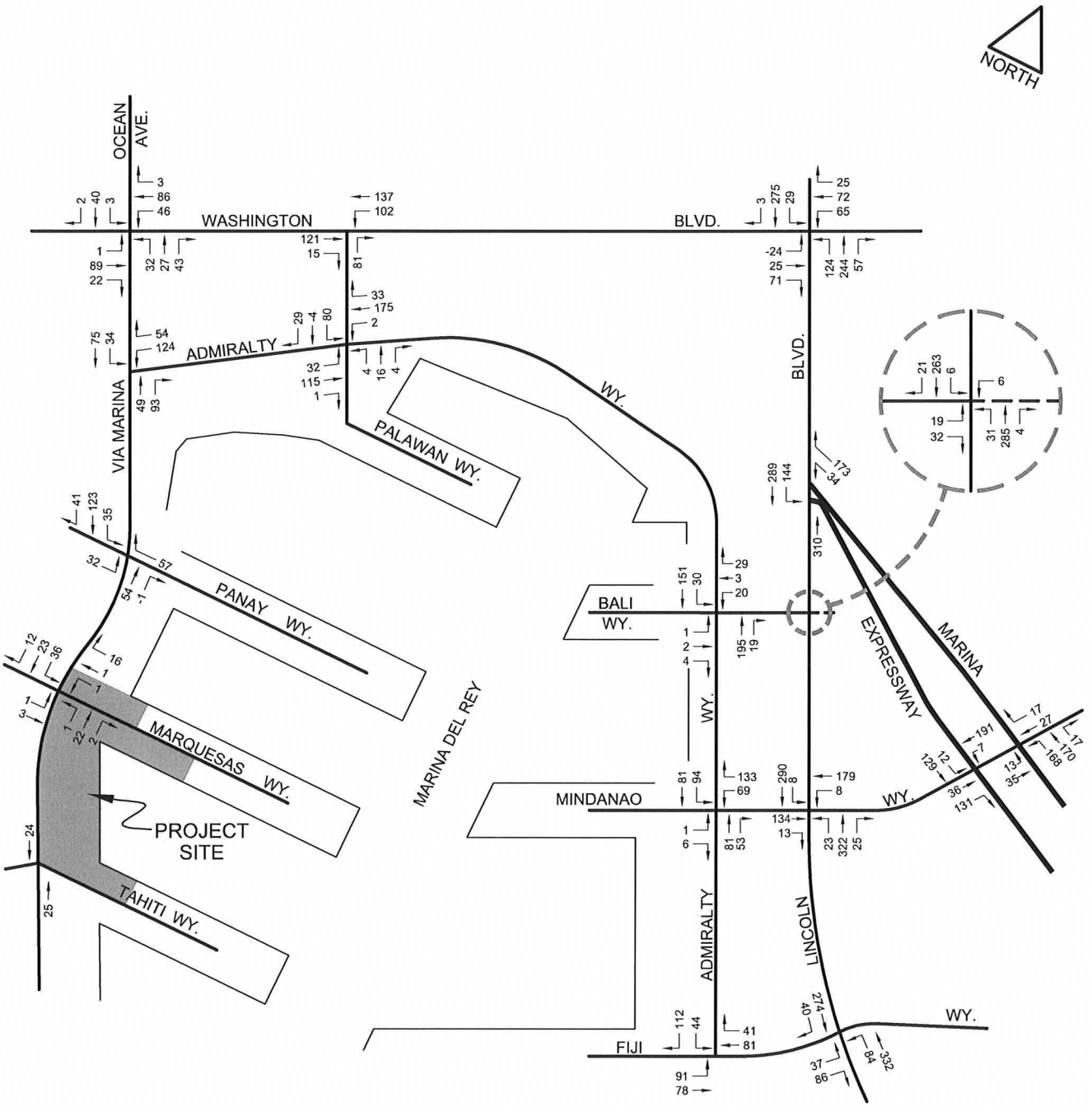

FIGURE 9(b)

5/22/2007

Marina del Rey Legacy\REPORT (5-2007)\PMRELPRJ

STICK

RELATED PROJECT TRAFFIC VOLUMES
PM PEAK HOUR

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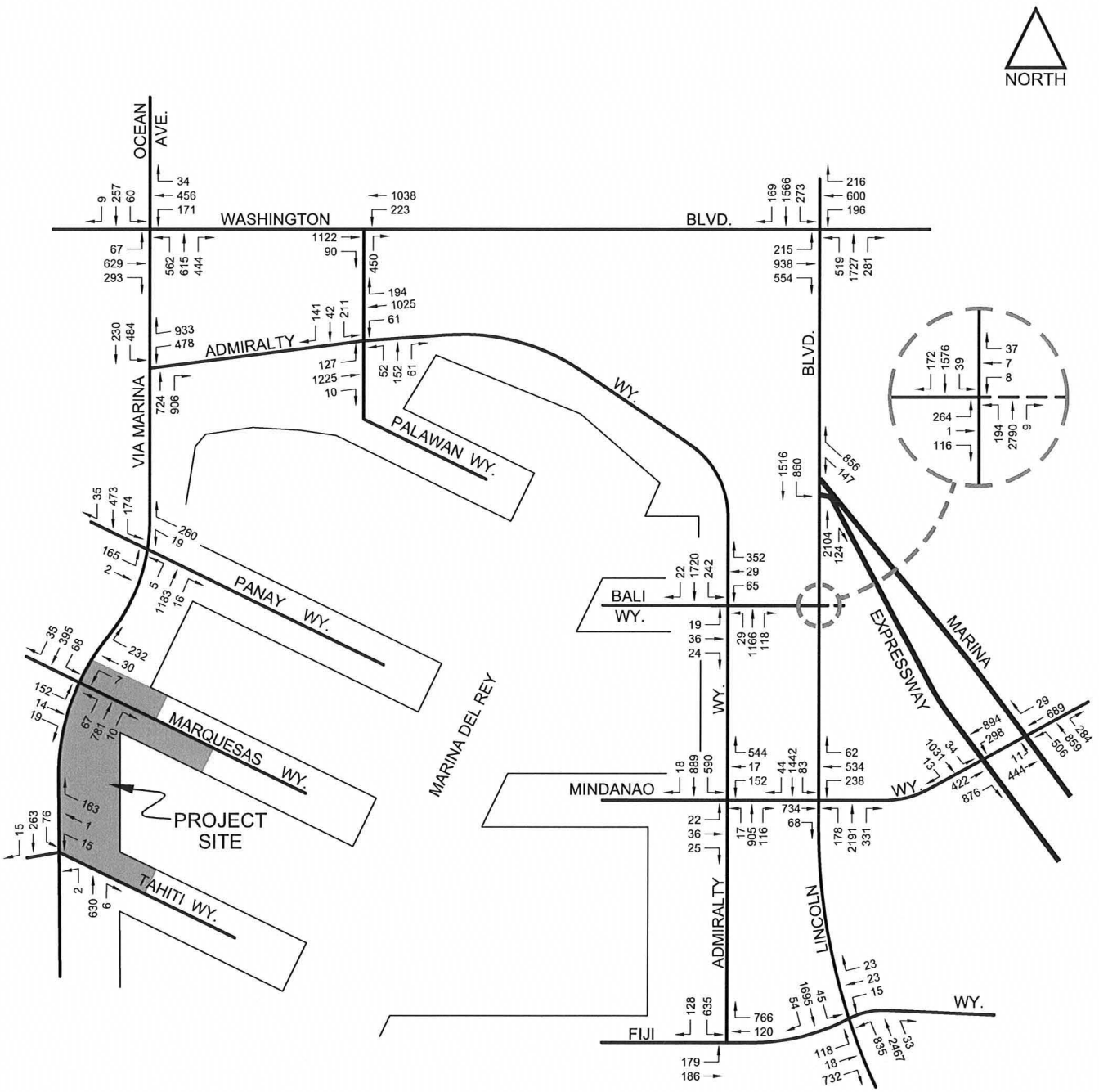

FIGURE 10(a)

12/3/2007

Marina del Rey Legacy\REPORT(12-2007)\AM2013WCUM

FUTURE (2013) TRAFFIC VOLUMES
WITH CUMULATIVE DEVELOPMENT
AM PEAK HOUR

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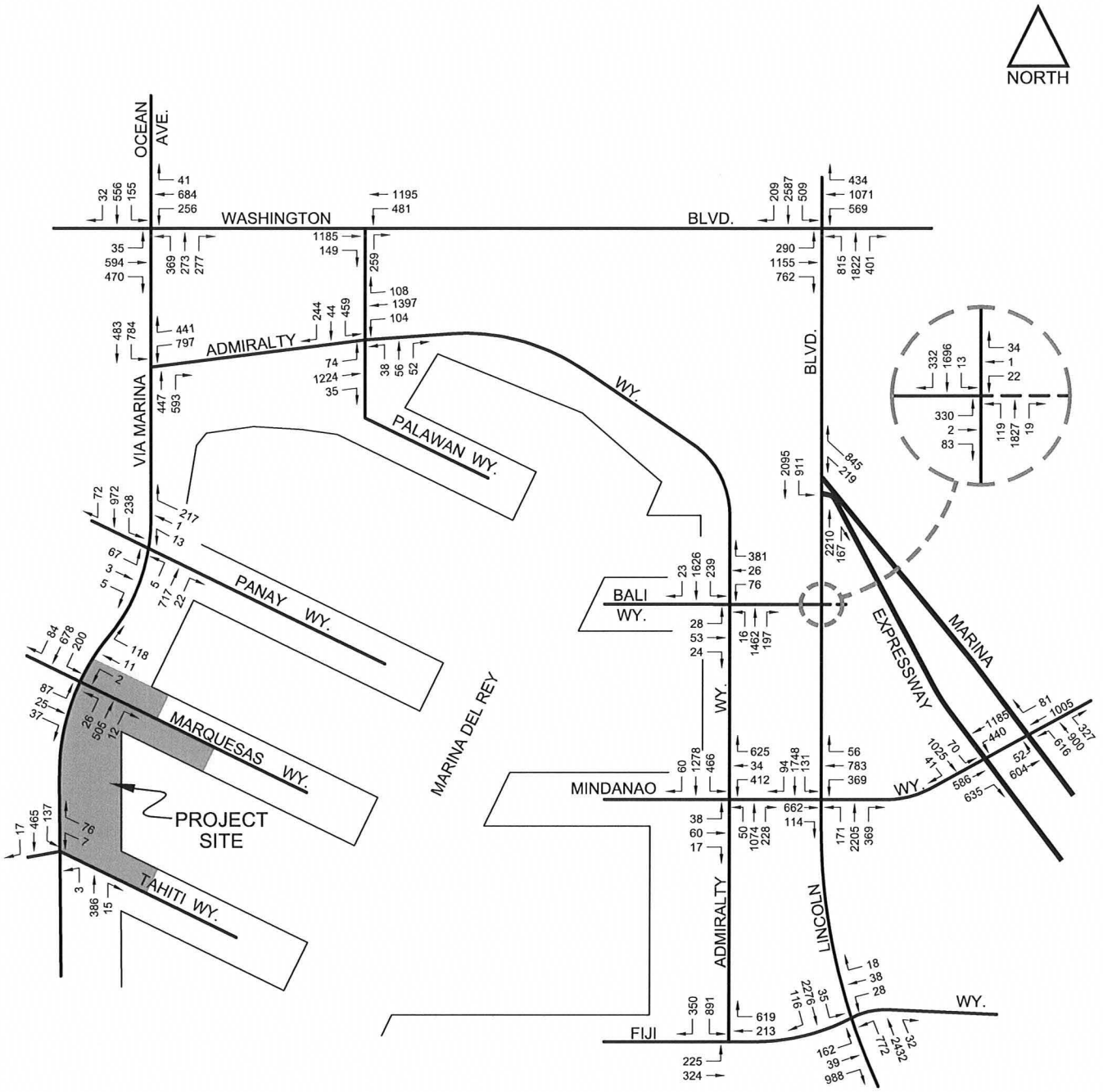

FIGURE 10(b)

12/3/2007

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FUTURE (2013) TRAFFIC VOLUMES
WITH CUMULATIVE DEVELOPMENT
PM PEAK HOUR

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Table 10
Critical Movement Analysis (CMA) Summary
Future (2013) Traffic Conditions With Cumulative Development

No.	Intersection	Peak Hour	With Ambient Growth CMA	With Ambient Growth LOS	With Ambient Growth Plus Project CMA	With Ambient Growth Plus Project LOS	With Ambient Growth Plus Project Impact	With Cumulative Development CMA	With Cumulative Development LOS	With Cumulative Development Impact	Proj. Impact Percent of Cum. Impact
1	Tahiti Way and	AM	0.276	A	0.276	A	0.000	0.278	A	0.002	0%
	Via Marina	PM	0.179	A	0.180	A	0.001	0.186	A	0.007	14%
2	Marquesas Way and	AM	0.271	A	0.333	A	0.062	0.364	A	0.093	67%
	Via Marina	PM	0.188	A	0.231	A	0.043	0.254	A	0.066	65%
3	Panay Way and	AM	0.360	A	0.388	A	0.028	0.508	A	0.148	19%
	Via Marina	PM	0.263	A	0.280	A	0.017	0.346	A	0.083	20%
4	Admiralty Way and	AM	0.730	C	0.749	C	0.019	0.821	D	0.091 **	21%
	Via Marina	PM	0.783	C	0.826	D	0.043 *	0.915	E	0.132 **	33%
5	Washington Boulevard and	AM	0.744	C	0.774	C	0.030	0.858	D	0.114 **	26%
	Via Marina/Ocean Avenue	PM	0.799	C	0.831	D	0.032 *	0.918	E	0.119 **	27%
6	Admiralty Way and	AM	0.444	A	0.461	A	0.017	0.620	B	0.176	10%
	Palawan Way	PM	0.629	B	0.655	B	0.026	0.809	D	0.180 **	14%
7	Washington Boulevard and	AM	0.668	B	0.682	B	0.014	0.935	E	0.267 **	5%
	Palawan Way	PM	0.747	C	0.759	C	0.012	0.910	E	0.163 **	7%
8	Washington Boulevard and	AM	0.807	D	0.820	D	0.013	0.947	E	0.140 **	9%
	Lincoln Boulevard	PM	1.390	F	1.399	F	0.009	1.552	F	0.162 **	6%
9	Lincoln Boulevard and	AM	0.707	C	0.707	C	0.000	0.810	D	0.103 **	0%
	Marina Expressway(SR-90)	PM	0.751	C	0.751	C	0.000	0.892	D	0.141 **	0%
10	Lincoln Boulevard and	AM	0.677	B	0.677	B	0.000	0.741	C	0.064 **	0%
	Bali Way	PM	0.534	A	0.537	A	0.003	0.640	B	0.106	3%
11	Lincoln Boulevard and	AM	0.754	C	0.782	C	0.028	0.959	E	0.205 **	14%
	Mindanao Way	PM	0.884	D	0.901	E	0.017 *	1.049	F	0.165 **	10%
12	Lincoln Boulevard and	AM	0.613	B	0.619	B	0.006	0.735	C	0.122 **	5%
	Fiji Way	PM	0.762	C	0.769	C	0.007	0.901	E	0.139 **	5%
13	Admiralty Way and	AM	0.480	A	0.510	A	0.030	0.605	B	0.125	24%
	Bali Way	PM	0.602	B	0.631	B	0.029	0.740	C	0.138 **	21%
14	Admiralty Way and	AM	0.654	B	0.712	C	0.058 *	0.889	D	0.235 **	25%
	Mindanao Way	PM	0.772	C	0.835	D	0.063 *	1.013	F	0.241 **	26%
15	Admiralty Way and	AM	0.266	A	0.272	A	0.006	0.346	A	0.080	8%
	Fiji Way	PM	0.386	A	0.390	A	0.004	0.519	A	0.133	3%
16	Marina Expressway(SR-90)	AM	0.423	A	0.428	A	0.005	0.479	A	0.056	9%
	WB and Mindanao Way	PM	0.555	A	0.569	A	0.014	0.672	B	0.117	12%
17	Marina Expressway(SR-90)	AM	0.641	B	0.657	B	0.016	0.783	C	0.142 **	11%
	EB and Mindanao Way	PM	0.769	C	0.779	C	0.010	0.868	D	0.099 **	10%

* indicates significant project traffic impact, prior to mitigation, per Los Angeles County Department of Public Works "Traffic Impact Analysis Report Guidelines", January 1, 1997.

** indicates significant cumulative traffic impact, prior to mitigation.

Thus, the potential impacts of project traffic on the regional freeway system were also examined. According to the CMP, a traffic analysis is required at all arterial monitoring intersections where the proposed project will add 50 or more trips during either the AM or PM weekday peak hours. One CMP intersection, Lincoln Boulevard and Marina Expressway, was identified in the project area. The proposed project is not expected to add 50 or more trips to this intersection during either the AM or PM weekday peak hours. However, this intersection was included as a study intersection and analyzed due to its close proximity to the project site. In addition, a traffic analysis is also required at all mainline freeway monitoring locations where the project will add 150 or more trips, in either direction, during either the AM or PM weekday peak hours. A review of the project's net trip generation assignments, as shown previously in Figures 5(a) and 5(b), indicates that the project is not expected to add substantial traffic volumes to the regional transportation system. The maximum amount of project traffic added to any particular freeway segment would occur along the eastbound Marina Expressway/Freeway east of Mindanao Way during the AM peak hour. During this time, the project would add approximately 71 trips, which is substantially less than the Los Angeles Congestion Management Program (CMP) threshold of 150 peak hour trips added to any freeway segment in a single direction. Based on this information, the impact criteria will not be exceeded, and no significant regional impacts on arterial monitoring intersections and mainline freeway locations will occur. Therefore, no further analysis was conducted.

Consistency with Marina Land Use Plan

New development within Marina del Rey is controlled by the Marina del Rey Land Use Plan (LUP), which is a component of the Los Angeles County Local Coastal Program.[5] This document specifies the amount of allowable new development within the Marina, based on the amount of additional traffic generated and mitigation measures to be installed incrementally with the new development. The new development is divided into two phases, Phase I and Phase II. Phase I has been completed, and is the amount of development considered to be "existing" at the present time. The allowable Phase II development (Second Generation) intensities are above and beyond the amount of existing Marina del Rey development. The Phase II "Buildout" development is allocated to 14 "development zones" within the Marina, with the development potential within each development zone based upon each zone's capacity to accommodate traffic. This determination is, in turn, based upon a traffic study conducted to assess development potential within the Marina, and to identify traffic and circulation improvements ("mitigation measures") necessary to accommodate the increased traffic levels.[6] The allowable Phase II development potential within each of the Marina's 14 development zones is described in the LUP and summarized in Table 11.

Since the adoption of the Marina LUP in 1996, approval for or actual construction of various projects throughout the Marina has occurred, "using up" some of the originally allowable Phase II development potential. As described previously in this report, the proposed development occurs within two of the Marina's development zones, Zone 2 (Parcel 9U) and Zone 3 (Parcels 10R and FF). No additional development has been

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[5] Marina del Rey Land Use Plan, County of Los Angeles Development of Regional Planning, Certified February 8, 1996.

[6] Marina del Rey Traffic Study, Final Report, Prepared for Los Angeles County Department of Regional Planning, DKS Associates in Association with Gruen Associates, January 12, 1991.

Table 11
Phase II Development Potential Allocated by Development Zone

1. **Bora Bora Development Zone**
   610 Dwelling Units

2. **Tahiti Development Zone**
   275 Dwelling Units
   288 Hotel Rooms
   76 Boat Slips

3. **Marquesas Development Zone**
   320 Dwelling Units
   15,000 sq. ft. Visitor-serving Commercial
   76 Boat Slips

4. **Panay Development Zone**
   250 Dwelling Units
   75 Congregate Care units
   10,000 sq. ft. Visitor-serving Commercial
   76 Boat Slips

5. **Palawan/Beach Development Zone**
   180 Dwelling Units
   200 Hotel Rooms
   42,000 sq. ft. Visitor-serving Commercial
   410 Restaurant Seats

6. **Oxford Development Zone**
   Fire Station Expansion

7. **Admiralty Development Zone**
   200 Hotel Rooms
   275 Restaurant Seats
   32,000 sq. ft. Office
   3,000 sq. ft. Library Expansion

8. **Bali Development Zone**
   382 Hotel Rooms
   40,000 sq. ft Conference Center
   75,000 sq. ft. Visitor-serving Commercial
   3,000 sq. ft. Marine Science Center
   500 Restaurant Seats
   Ferry Terminal Site
   86 Boat Slips

9. **Mindanao Development Zone**
   14,500 sq. ft. Visitor-serving Commercial
   26,000 sq. ft. Office

10. **Fisherman's Village Development Zone**
    20,000 sq. ft. Visitor-serving Commercial
    350 Restaurant Seats
    Ferry Terminal Site

11. **Harbor Gateway Development Zone**
    255 Dwelling Units
    34 Boat Slips

12. **Via Marina Development Zone**
    530 Dwelling Units
    30,000 sq. ft. Visitor-serving Commercial
    340 Restaurant Seats

13. **North Shore Development Zone**
    Open space, road frontage buffer

14. **Fiji Way Development Zone**
    2,000 sq. ft. Visitor-serving Commercial

Source: Marina del Rey Land Use Plan, February 8, 1996.

Notes: Non-coastal development may be converted to Hotel, Visitor-Serving Commercial or Marina Commercial uses consistent with the conversion provisions of subsection C5 of Section 22.46.1090.

approved within DZ 2. However, one development (i.e. Marina Two) has been approved within DZ 3.

The DZ 2 portion of the project consists of the 288-unit hotel/timeshare resort on the northern portion of Parcel 9U, and the approximately 1.46-acre public wetland park on the southern portion of the parcel. Parcel 9U is currently vacant. The 1.46-acre public wetland park is to replace the area of Parcel FF (located at the northeast corner of the intersection of Marquesas Way and Via Marina) that is designated as Open Space in the LCP. Although not specifically noted in the development allowances, public open space development within the Marina is encouraged and is considered to be compatible with the intent of the Land Use Plan development standards. As shown in Table 11, the original development allowances for DZ 2 included a total of 275 dwelling units, 288 hotel rooms and 76 boat slips. Thus, the proposed project development in DZ 2, with 288 hotel/timeshare suites, accessory resort uses and a public park, would be consistent with the development allowances for this zone.

A portion of DZ 3 will also be developed as part of this project. The 136 existing apartments located on Parcel 10R along Via Marina and Marquesas Way will be removed. A total of 400 and 126 new apartments will be constructed on Parcels 10R and FF, respectively, for a total of 526 new apartments within DZ 3. Parcel FF is currently developed with an approximately 207-space surface parking lot. The project will also remove a total of at least 184 existing boat spaces and develop 174 new boat slips adjacent to Parcel 10R. Thus, the proposed project will result in a net increase of 390 apartments, and a decrease of at least 10 boat slips within DZ 3.

The original development allowances for DZ 3 included a total of 320 dwelling units, a total of 15,000 square feet of visitor-serving retail, and 76 boat slips; however, the

development potential for each development zone is granted on a "first come, first served" basis.

As noted previously, another project (Marina Two) is currently approved for development in Zone 3. The Marina Two project included development on both Parcel 12, within DZ 3, and Parcel 15 within DZ 4. Only the DZ 3 portion of the development is pertinent to the proposed project. The Marina Two project was approved to develop a total of 437 residential dwelling units, 2,000 square feet of visitor-serving retail, and 227 boat slips on parcels containing a total of 120 existing dwelling units, 5,600 square feet of visitor-serving retail, and 464 boat slips, all of which would be removed. The net effect of the Marina Two project on the DZ 3 remaining allowable development is the utilization of 317 dwelling units, reducing the remaining allowable development potential for DZ 3 to only three (3) dwelling units. However, no change in the allowable development potential for the visitor-serving retail or boat slips would occur due to the Marina Two project, since the approved development actually reduces the amount of visitor-serving retail on the site by 3,600 square feet, and the number of DZ 3 boat slips by 237 slips. Since the Phase II LUP development allowances were based on development beyond the existing conditions at the time of its adoption, the Marina Two project reductions in retail space and boat slips are not considered to affect the allowable Phase II development amounts for these uses, which remain at 15,000 square feet of visitor-serving retail and 76 boat slips, respectively.

Consequently, the proposed net increase of 264 dwelling units on Parcel 10R and 126 dwelling units on Parcel FF (390 net combined) is 387 dwelling units more than the three (3) dwelling units currently available in DZ 3. Therefore, the project proposes an amendment to the LCP to transfer residential development rights from other adjoining and/or nearby development zones to allow for the proposed increase in dwelling units within DZ 3.

The proposed project would transfer development allowances for Parcel 10R of approximately 261 dwelling units (out of an allowable total of 275 units) from the abutting DZ 2. The transfer of 261 dwelling units from DZ 2 plus the 3 remaining allowable units for DZ 3 would allow for the development increase of 264 dwelling units on Parcel 10R. In addition, the proposed project would transfer development allowances from the remaining 14 dwelling units within DZ 2, and transfer 112 dwelling unit allowances from nearby DZ 1 (the "Bora Bora" DZ comprised of parcels at near the terminus of Via Marina) to DZ 3. As a result, DZ 2 would have no allowable dwelling units remaining. However, as noted earlier, this condition will not significantly affect development within DZ 2, since the only project proposed for this zone is the subject 288-suite hotel/timeshare resort, which is currently allowed. Thus, the proposed residential development allowance transfers from DZ 1 and DZ 2 would permit the entire proposed Parcel 10R and FF development within DZ 3 to be consistent with the development allowances described in the Marina del Rey Land Use Plan.

The Marina del Rey Land Use Plan also requires that proposed projects demonstrate compatibility with the Circulation Element of the Plan, based upon a comparison of the amount of trips generated by the allowable development and the trips generated by the proposed project. As noted previously, the Phase II development potential for each zone is based upon the Marina's ultimate capacity to accommodate traffic. To determine the compatibility of the proposed development with the Circulation Element, the PM peak hour trip generation potentials for both the proposed and allowable land use were computed. The trip generation rates used in this comparison are specified in Table 2 of Appendix G, Transportation Improvement Program (TIP), of the Marina del Rey Local Implementation Program, which is in turn, a part of the Land Use Plan. These trip rates were used to determine the number of trips attributable to the allowed Phase II development levels, and to assess the need for and effectiveness of the

roadway improvements required as part of the Phase II development. The calculation of the number of allowable and proposed PM peak hour trips for DZ 2 and DZ 3 is summarized in Table 12.

Table 12 shows that the project development proposed for DZ 2 is well within the allowable "buildout" trip limits for that zone, as determined based on the allowed development land uses specified in the Land Use Plan. No other developments have occurred under the Phase II Marina development for DZ 2, and as such, development of the proposed project including the residential development transfer of 275 dwelling units from DZ 2 to DZ 3 leaves 9.58 net allowable trips remaining for future development in this Zone.

Development Zone 3 exhibits a similar situation. The potential development listed in the Marina del Rey Land Use Plan Development for Zone 3 would allow a total of 180.50 net new PM trips. However, the approved Marina Two project on Parcel 12 results in a net total of 49.59 trips, leaving 130.91 remaining allowable trips. The project development proposed for DZ 3 would produce a total of 125.88 net new PM peak-hour trips. Although the 125.88 PM peak-hour trips are less than the 130.91 remaining allowable trips in DZ 3, the excess trips are related to the primarily non-residential use allocations. Thus, a residential development allowance transfer is required. The project proposes the transfer of 112 dwelling units from DZ 1 to DZ 3, and as noted earlier, the transfer of 275 dwelling units from DZ 2 to DZ 3, resulting in an increase of the trip allowance within DZ 3 by 126.16 trips. As a result, the allowable trips available for future development for this Zone following the proposed project would be approximately 131.19 trips. As such, the proposed project is compatible with the trip generation limits identified in the Marina del Rey Land Use Plan for both Development Zones 2 and 3.

Table 12
PM Peak Hour Trips
Development Zones 2 and 3

Development Zone 2

Allowable Phase II Development (Without Proposed Project)		
275 dwelling units x 0.326 trips/unit	=	89.65 trips
288 hotel rooms x 3.53 trips/room	=	101.66 trips
76 boat slips x 0.126 trips/slip	=	9.58 trips
Total Allowable Trips		200.89 trips
Approved/Constructed Phase II Development		
None		
Total Approved Trips		0.00 trips
Remaining Allowable Phase II Trips (Without Proposed Project)		200.89 trips
Proposed Development (Parcel 9U)		
288 new hotel units x 0.353 trips/unit	=	101.66 trips
1.46-acre park x 0.00 trips/acre	=	0.00 trips
Net Parcel 9U Project Trips		101.66 trips
Proposed Residential Development Allowance Transfers		
275 new dwelling units x 0.326 trips/unit (To DZ 3)		89.65 trips
Total Transferred Residential Trips		89.65 trips
Surplus/(Deficit) DZ 2 Allowable Trips (With Proposed Project)	=	9.58 trips

Development Zone 3

Allowable Phase II Development (Without Proposed Project)		
320 dwelling units x 0.326 trips/unit	=	104.32 trips
15,000 sq. ft. visitor-serving retail x 4.44 trips/KSF	=	66.60 trips
76 boat slips x 0.126 trips/slip	=	9.58 trips
Total Allowable Trips		180.50 trips
Approved Phase II Development (Parcel 12)		
402 new dwelling units x 0.326 trips/unit	=	131.05 trips
35 new senior dwelling units x 0.100 trips/unit	=	3.50 trips
2,000 sq. ft. visitor-serving retail x 4.44 trips/KSF	=	8.88 trips
227 boat slips x 0.126 trips/slip	=	28.60 trips
		172.03 trips
Less 120 existing dwelling units x 0.326 trips/unit	=	-39.12 trips
Less 5,600 sq. ft. existing retail x 4.44 trips/KSF	=	-24.86 trips
Less 464 boat slips 0.126 trips/slip	=	-58.46 trips
Net Approved Trips		49.59 trips
Remaining Allowable Phase II Trips (Without Proposed Project)		130.91 trips

Table 12 (Cont.)
PM Peak Hour Trips
Development Zones 2 and 3

Proposed Development (Parcels 10R and FF)		
Parcel 10R:		
400 new dwelling units x 0.326 trips/unit	=	130.40 trips
174 new boat slips x 0.126 trips/slip	=	21.92 trips
		152.32 trips
Less 136 existing dwelling units x 0.326 trips/unit	=	-44.34 trips
Less 184 existing boat slips x 0.126 trips/slip	=	-23.18 trips
Net Parcel 10R Project Trips		84.80 trips
Parcel FF:		
126 new dwelling units x 0.326 trips/unit	=	41.08 trips
Net Parcel FF Project Trips		41.08 trips
Proposed Residential Development Allowance Transfers		
112 new dwelling units x 0.326 trips/unit (From DZ 1)		36.51 trips
275 new dwelling units x 0.326 trips/unit (From DZ 2)		89.65 trips
Total Transferred Residential Trips		126.16 trips
Surplus/(Deficit) DZ 3 Allowable Trips (With Proposed Project)		131.19 trips

Additionally, overall development within the Marina is projected to remain well within acceptable limits. The Marina del Rey Phase II "Buildout" development allowed by the Land Use Plan and the TIP, as summarized in Table 11, produces a total of 2,750 net new PM peak hour trips for the Marina, beyond those trips occurring at the time those documents were certified. The Land Use Plan and its supporting documents were updated and certified most recently in February of 1996. Only four projects have been developed to date under the allowed Phase II development, although several additional developments are pending, approved, or currently being constructed. The developed projects (Dolphin Marina and the Parcel 20 Development within DZ 4, the Parcel 112 Development within DZ 1, and Parcels 50 and 83 within DZ 9) result in an increase of 26.97 PM peak hour trips, an increase of 25.80 PM peak hour trips, a decrease of 3.87

net PM peak hour trips, and an increase of 20.87 PM peak hour trips, respectively, for a total of 69.77 trips, which is about 2.5 percent of the total allowable Phase II trips. However, several development proposals, including the subject project, have been approved, are under construction, or are currently proceeding through the approval process. These projects will also contribute toward the overall Marina trip cap. As shown in Table 12, the proposed project will result in a net trip generation of approximately 227.54 PM peak hour trips.

The other currently approved, proposed, or potential projects within the Marina include the Marina Two project (152.34 total trips on both Parcels 12 and 15), the redevelopment of Parcels 95 (135.26 trips), the approved redevelopment of Parcel 97 (2.16 trips), the Parcel 140 residential project (37.49 trips), the Villa Venetia project (87.39 trips on Parcel 64), the Parcel 27 hotel expansion project (24.36 trips), the mixed-use expansion development on Parcels 55, 56 and W (209 trips), the approved Del Rey Shores Project (111.49 trips on both Parcels 100 and 101), a proposed hotel project on Parcel IR (51.89 trips), The Waterfront project on Parcels 33/NR (22.07 trips), the Boat Central/Pacific Marina Development on Parcels 52/GG (51.38 trips), and the proposed Congregate-care Retirement Facility on Parcel OT and Holiday Harbor Courts project on Parcel 21 (30.54 trips). These developments could potentially add a total of approximately 972.83 net new trips to the Marina, and including the already developed projects (Dolphin Marina and the Parcels 20, 112 and 50/83 Developments) and the subject project, would result in a net total addition of about 1,212.68 PM trips, or approximately 44 percent of the total of 2,750 PM peak hour trips allowed under the development and mitigation scenarios approved for Marina del Rey.

This level of overall trip generation from the developed, approved and proposed Marina projects is less than the 50 percent development level at which Category 3 System-Wide Improvements (as described in the LCP), such as the Admiralty Way improvement

to five lanes, are warranted before any additional development can occur. It should also be noted that the proposed project has identified several Category 3 improvements as mitigation measures for the cumulative traffic impacts, described in detail in the Mitigation Measures section of this report.

MITIGATION MEASURES

As described in the preceding section, the development of the proposed project will result in four significant project impacts, prior to mitigation. However, these project-specific impacts can be mitigated to a less than significant level through the implementation of area traffic improvement measures recommended in the adopted Marina del Rey Specific Plan Transportation Improvement Program (TIP). The TIP includes specific detailed transportation and circulation improvements designed to fully mitigate the traffic generation of the Phase II development in Marina del Rey.

In order to fund the recommended TIP roadway improvements, all projects developed within the Marina, including the proposed project, are required to pay a traffic mitigation fee imposed by the County of Los Angeles pursuant to the Marina del Rey Specific Plan Transportation Improvement Program. This fee is intended to fund the Category 1 (local Marina) and Category 3 (regional) roadway improvements described in the TIP, by providing "fair share" contributions toward the improvements, based on the amount of project PM peak hour trips. (Category 2 roadway improvements are reserved for Area A, which is DZ 15 and is part of the Playa Vista Development on the Marina.) These improvements address local traffic generated in and confined to the Marina, as well as trips which leave or pass through the Marina (regional trips). The County's traffic mitigation fee structure is currently $5,690 per PM peak hour trip. Based on the expected net project trip generation of 228 PM peak hour trips, the project would be required to pay a $1,297,320 in trip mitigation fees ($716,940 attributable to Legacy Partners and $580,380 attributable to Woodfin). A portion of these fees is designated toward the Category 3 (regional) transportation improvements.

The County Department of Public Works has expressed that it prefers to implement the Marina del Rey TIP-recommended roadway improvements as a single major project in

order to minimize traffic disruptions and construction time. Therefore, payment of the traffic impact mitigation fee is the recommended mitigation over the partial construction by this project of portions of the relevant TIP roadway improvements. However, should the County decide that roadway improvement measures must be implemented earlier to assure that the project's direct significant impacts are reduced to less than significant levels on or before project occupancy, the following measures are recommended:

- Admiralty Way and Via Marina – Widen the south side of Admiralty Way to accommodate a triple westbound left turn movement, and two lanes eastbound on Admiralty Way with a right-turn merge lane from northbound Via Marina. This improvement is identified in the Marina del Rey TIP as a Category 1 improvement, and will enhance traffic flow within the Marina.

- Washington Boulevard and Via Marina/Ocean Avenue – No feasible physical improvements are identified in the TIP that remain available to mitigate this potential project traffic impact. However, the County of Los Angeles Department of Public Works has identified an improvement at the nearby intersection of Washington Boulevard and Palawan Way that would provide additional egress from the Marina, reducing traffic volumes on the northbound approach of Via Marina at this intersection, and providing mitigation for the cumulative impacts. The proposed improvement would reconstruct the intersection of Washington Boulevard and Palawan Way to allow for dual northbound left-turns onto westbound Washington Boulevard, and install a new traffic signal at that intersection. The improvement will provide an additional means of accessing westbound Washington Boulevard from westbound Admiralty Way, reducing the existing high northbound volumes at Washington Boulevard and Via Marina/Ocean Avenue. (See "Washington Boulevard and Palawan Way" below for additional details.)

- Lincoln Boulevard and Mindanao Way – Widen the west side of Lincoln Boulevard both north and south of Mindanao Way, and relocate and narrow the median island on Lincoln Boulevard to provide a right-turn lane in the northbound direction. This improvement is identified in the Marina del Rey TIP as a Category 1 improvement, and will enhance the traffic flow within the Marina.

- Admiralty Way and Mindanao Way – Install dual left-turn lanes on Admiralty Way for southbound travel at the approach to Mindanao Way and modify the traffic signal to provide a westbound right-turn phase concurrent with the southbound left-turn movement. The dual left-turn lanes on Admiralty Way will enhance egress from the Marina at Mindanao Way, has already been approved as part of a previous project (Marina Two), and would mitigate to less than significance the combined traffic impacts of both projects. It should be noted that this improvement is not included in the TIP. As such, the proposed project would be conditioned to contribute "fair share" funding to this improvement above and beyond the previously identified traffic mitigation fees. The project's "fair share" proportion would be negotiated between the proposed project and the County.

To determine the quantitative effect of these mitigation measures on the project-specific significant impact, a supplemental analysis was performed. This analysis utilized the same analysis procedures and techniques as were used in the preceding analysis of intersection conditions, with the exception that the proposed mitigation measures were assumed to be "in place" for the "With Mitigation" scenario. The results of the supplemental "With Mitigation" analysis are presented in Table 13 and show that, once

Table 13
Critical Movement Analysis (CMA) Summary
Future (2013) With Project Plus Mitigation Conditions

No.	Intersection	Peak Hour	With Ambient Growth		With Ambient Growth Plus Project			With Project Plus Mitigation		
			CMA	LOS	CMA	LOS	Impact	CMA	LOS	Impact
4.	Admiralty Way and	AM	0.730	C	0.749	C	0.019	0.637	B	-0.093
	Via Marina	PM	0.783	C	0.826	D	0.043 *	0.739	C	-0.044
5.	Washington Boulevard and	AM	0.744	C	0.774	C	0.030	0.689	B	-0.055
	Via Marina/Ocean Avenue	PM	0.799	C	0.831	D	0.032 *	0.791	C	-0.008
11.	Lincoln Boulevard and	AM	0.754	C	0.782	C	0.028	0.704	C	-0.050
	Mindanao Way	PM	0.884	D	0.901	E	0.017 *	0.819	D	-0.065
14.	Lincoln Blvd. and	AM	0.654	B	0.712	C	0.058 *	0.608	B	-0.046
	Mindanao Wy.	PM	0.772	C	0.835	D	0.063 *	0.734	C	-0.038

* indicates significant project traffic impact, prior to mitigation, per Los Angeles County Department of Public Works "Traffic Impact Analysis Report Guidelines ", January 1, 1997.

installed, these mitigation measures will reduce the traffic impacts of the proposed project to a less than significant level, and no additional project-specific traffic improvements are necessary.

Although the project itself would potentially significantly impact only four of the area intersections, an analysis of cumulative traffic impacts at the study intersections indicates that traffic resulting from total development throughout the project vicinity, including the proposed project, could produce significant impacts at 12 of the 17 locations analyzed. The TIP improvements are designed to address traffic growth due to cumulative development within and surrounding the Marina, and therefore, payment of the traffic impact mitigation fee described earlier is intended to mitigate the proposed project's incremental contributions toward cumulative traffic growth and the resulting impacts in the study area. However, the County acknowledges that traffic growth within the project vicinity has outpaced the projections upon which the TIP trip fees were

based, and therefore, an analysis of cumulative impacts with respect to the effectiveness of the proposed TIP improvements was requested.

The intersection improvement measures recommended to address cumulative traffic impacts in the project vicinity are shown in Appendix G (Transportation Improvement Program – TIP) of the Marina del Rey Local Implementation Program and described below.

- Admiralty Way and Via Marina – Reconstruct the intersection to provide for a realignment of Admiralty Way as a "through roadway" with the southern leg of Via Marina. As described above, the northern leg of Via Marina, south of Washington Boulevard, will intersect into Admiralty Way in a "T" configuration. The striping for turning movements at the reconfigured intersection will be constructed as dual left-turn and dual/triple right-turn movements. This improvement is identified in the Marina del Rey TIP, and will enhance traffic flow within the Marina.

- Washington Boulevard and Via Marina/Ocean Avenue – No feasible physical improvements are identified in the TIP that remain available to mitigate this potential cumulative impact. However, the County of Los Angeles Department of Public Works has identified an improvement at the nearby intersection of Washington Boulevard and Palawan Way that would provide additional egress from the Marina, reducing traffic volumes on the northbound approach of Via Marina at this intersection, and providing mitigation for the cumulative impacts. The proposed improvement would reconstruct the intersection of Washington Boulevard and Palawan Way to allow for dual northbound left-turns onto westbound Washington Boulevard, and install a new traffic signal at that intersection. The improvement will provide an additional means of accessing

westbound Washington Boulevard from westbound Admiralty Way, reducing the existing high northbound volumes at Washington Boulevard and Via Marina/Ocean Avenue. (See "Washington Boulevard and Palawan Way" below for additional details.)

In addition, the Marina del Rey TIP also identified an improvement at the intersection of Via Marina and Admiralty Way that will enhance traffic flow between Admiralty Way and Via Marina south of Admiralty Way within the Marina, reducing the northbound right-turn traffic volumes on Via Marina at Washington Boulevard. This improvement would reconstruct the Admiralty Way/Via Marina intersection to realign Admiralty Way as a "through roadway" with the southern leg of Via Marina. The northern leg of Via Marina, south of Washington Boulevard, will intersect into Admiralty Way in a "T" configuration. The striping for turning movements at the reconfigured intersection will be constructed as dual left and dual/triple right-turning movements. As a result, northbound traffic volumes on Via Marina would need to turn left (instead of making a through movement) at Admiralty Way to access eastbound Washington Boulevard. Due to the high left-turn volume on northbound Via Marina at Admiralty Way, some of these traffic volumes would reroute along eastbound Admiralty Way and turn left at Palawan Way.

- Admiralty Way and Palawan Way – Restripe the southbound approach to convert the through lane into a left/through shared lane. Restripe the northbound approach to provide an exclusive right-turn only lane, in addition to a shared left-turn/through lane. In addition, add a third westbound through lane to Admiralty Way within the existing right-of-way by moving the median and restriping Admiralty Way. These measures are identical to or consistent with the improvements in the Marina del Rey TIP.

- Washington Boulevard and Palawan Way – Install a new traffic signal at this intersection (as described above as "in lieu" mitigation for the cumulative impact at Washington Boulevard and Via Marina/Ocean Avenue). The south leg of the intersection should be realigned to reduce the angle of the northbound right-turn only lane, and provide a more perpendicular approach, plus provide northbound dual left-turn lanes.

  While this improvement is currently being investigated by the County for implementation as a new TIP- type measure, funded by fair share contributions by projects within Marina del Rey, it is not currently included in the TIP improvement program. As such, the proposed project would be conditioned to contribute "fair share" funding to this improvement above and beyond the previously identified traffic mitigation fees. As indicated in Table 10, the project will contribute 8 percent of the impact at this location. Cost estimates for this improvement are currently being finalized, but are expected to be between approximately $150,000 and $180,000, with a project responsibility of $12,000 to $14,400.

- Lincoln Boulevard and Washington Boulevard – No feasible physical improvements are currently available to mitigate this potential cumulative impact. However, regional transportation improvements being considered include the future extension of the Marina Freeway (SR 90) westward to connect with Admiralty Way. The extension, slated for completion by the year 2016, will help alleviate traffic congestion in the area, including at the key intersection of Lincoln Boulevard and Washington Boulevard. However, it should be noted that a short-term cumulative traffic impact could remain at this location should the extension of the SR-90 or another measure of equal effectiveness is not implemented by the time the anticipated cumulative traffic

growth occurs. This measure is identified in Appendix G of the Marina del Rey Local Implementation Program and must receive approval from the Board of Supervisors, the City of Los Angeles and Caltrans.

Furthermore, if the extension of the SR-90 is not constructed at all (due to not having concurrent approval by the Board of Supervisors, the City of Los Angeles and Caltrans, or for other reasons) or another measure of equal effectiveness is not identified, a contingent significant cumulative traffic impact would remain at this location.

- Lincoln Boulevard and Marina Expressway (SR 90) – Extend Route 90 to connect to Admiralty Way across Lincoln Boulevard. The extension would reconstruct and expand the at-grade intersection, providing additional capacity for all approaches. This improvement is currently included in the TIP roadway improvements funded by the trip fee.

  However, it should be noted that a short-term cumulative traffic impact could remain at this location if the extension of the SR-90 or another measure of equal effectiveness is not implemented by the time the anticipated cumulative traffic growth occurs. Furthermore, if the extension of the SR-90 is not constructed at all (due to not having concurrent approval by the Board of Supervisors, the City of Los Angeles and Caltrans, or for other reasons) or another measure of equal effectiveness is not identified, a significant cumulative traffic impact could remain at this location.

- Lincoln Boulevard and Bali Way – No feasible physical improvements are currently available to mitigate this potential cumulative impact. However, regional transportation improvements being considered include the future extension of the Marina Freeway (SR 90) westward to connect with Admiralty

Way. The extension, slated for completion by the year 2016, will help alleviate traffic congestion in the area, including at the intersection of Lincoln Boulevard and Bali Way. However, it should be noted that a short-term cumulative traffic impact could remain at this location if the extension of the SR-90 or another measure of equal effectiveness is not implemented by the time the anticipated cumulative traffic growth occurs. The SR-90 extension is identified in Appendix G of the Marina del Rey Local Implementation Program and must receive approval from the Board of Supervisors, the City of Los Angeles and Caltrans.

Furthermore, if the extension of the SR-90 is not constructed at all (due to not having concurrent approval by the Board of Supervisors, the City of Los Angeles and Caltrans, or for other reasons) or another measure of equal effectiveness is not identified, a significant cumulative traffic impact could remain at this location.

- Lincoln Boulevard and Mindanao Way – No feasible physical improvements are currently available to mitigate this potential cumulative impact. However, regional transportation improvements being considered include the future extension of the Marina Freeway (SR 90) westward to connect with Admiralty Way. The extension, slated for completion by the year 2016, will help alleviate traffic congestion in the area, including at the intersection of Lincoln Boulevard and Mindanao Way, which currently provides direct access from the SR-90 to Admiralty Way in the Marina, by providing a direct access alternative route. However, it should be noted that a short-term cumulative traffic impact could remain at this location if the extension of the SR-90 or another measure of equal effectiveness is not implemented by the time the anticipated cumulative traffic growth occurs. The SR-90 extension is identified in Appendix G of the

Marina del Rey Local Implementation Program and must receive approval from the Board of Supervisors, the City of Los Angeles and Caltrans.

Furthermore, if the extension of the SR-90 is not constructed at all (due to not having concurrent approval by the Board of Supervisors, the City of Los Angeles and Caltrans, or for other reasons) or another measure of equal effectiveness is not identified, a significant cumulative traffic impact could remain at this location.

- Lincoln Boulevard and Fiji Way – No feasible physical improvements are currently available to mitigate this potential cumulative impact. However, regional transportation improvements being considered include the future extension of the Marina Freeway (SR 90) westward to connect with Admiralty Way. The extension, slated for completion by the year 2016, will help alleviate traffic congestion in the area, including at the intersection of Lincoln Boulevard and Fiji Way. However, it should be noted that a short-term cumulative traffic impact could remain at this location if the extension of the SR-90 or another measure of equal effectiveness is not implemented by the time the anticipated cumulative traffic growth occurs. The SR-90 extension is identified in Appendix G of the Marina del Rey Local Implementation Program and must receive approval from the Board of Supervisors, the City of Los Angeles and Caltrans.

  Furthermore, if the extension of the SR-90 is not constructed at all (due to not having concurrent approval by the Board of Supervisors, the City of Los Angeles and Caltrans, or for other reasons) or another measure of equal effectiveness is not identified, a contingent significant cumulative traffic impact could remain at this location.

- Admiralty Way and Bali Way – Add a third westbound through lane to Admiralty Way within the existing right-of-way by moving the median and restriping Admiralty Way, as identified in the TIP.

- Admiralty Way and Mindanao Way – Widen northbound Admiralty Way to provide a right-turn lane at Mindanao Way, as identified in the TIP. Also, install dual left-turn lanes on Admiralty Way for southbound travel at the approach to Mindanao Way and modify the traffic signal to provide a westbound right-turn phase concurrent with the southbound left-turn movement. The dual left-turn lanes on Admiralty Way will enhance egress from the Marina at Mindanao Way, and has already been approved as part of a previous project (Marina Two). In addition, restripe the left-turn lane in the eastbound direction to a left-through shared lane. A second receiving lane is already present on the east leg departure from this intersection. It should be noted that the installation of dual left-turn lanes on Admiralty Way, the traffic signal modification and the restripe of the left-turn lane in the eastbound direction to a left-through shared lane are not identified in the TIP. As such, the proposed project would be conditioned to contribute "fair share" funding to this non-TIP improvement above and beyond the previously identified traffic mitigation fees. The project's "fair share" proportion would be negotiated between the proposed project and the County.

- Marina Expressway (SR 90) Eastbound and Mindanao Way – Restripe Mindanao Way to provide two through lanes and one free right-turn lane in the eastbound approach. Also provide an appropriate receiving and merge area on the eastbound Marina Expressway for the free right-turn movement from eastbound Mindanao Way. No additional right-of-way is required for this measure. This improvement is not identified in the TIP. As such, the

proposed project would be conditioned to contribute "fair share" funding to this non-TIP improvement above and beyond the previously identified traffic mitigation fees. The project's "fair share" proportion would be negotiated between the proposed project and Caltrans.

The effectiveness of the recommended cumulative mitigation measures was evaluated in a supplemental analysis. This "With Cumulative Development Plus Mitigation" analysis in Table 14 utilized the same methodologies and assumptions as described previously, again with the exception that the recommended cumulative improvement measures described above were assumed to be "in place" for the "With Cumulative Development Plus Mitigation" scenario. This assumption also included the redistribution of traffic at several intersections (Via Marina at Washington Boulevard, and Admiralty Way, and Palawan Way at Washington Boulevard and Admiralty Way) as a result of anticipated travel pattern changes resulting from the mitigation measures at Washington Boulevard and Palawan Way, and at Via Marina and Admiralty Way. As discussed above, mitigation of cumulative traffic impacts to less than a level of significance may not occur if one or more mitigation measures is not implemented.

As shown in Table 14, the implementation of the cumulative mitigation measures cited above would result in a reduction of all cumulative traffic impacts at all study intersections. At intersections where the "With Cumulative Development Plus Mitigation" traffic conditions can be evaluated, cumulative impacts would be reduced to a less than significant level. Table 14 also indicates that, since the design of the proposed SR-90 extension has not been determined, calculation of the exact benefits to specific intersections for which the extension is identified in the Marina del Rey LUP as mitigation cannot be made at this time. The County is currently preparing an

Table 14
Critical Movement Analysis (CMA) Summary
Future (2013) Traffic Conditions With Cumulative Development Plus Mitigation

No.	Intersection	Peak Hour	Existing Plus Ambient CMA	Existing Plus Ambient LOS	With Cumulative Development CMA	With Cumulative Development LOS	With Cumulative Development Impact	With Cumulative Dev. Plus Mitigation CMA	With Cumulative Dev. Plus Mitigation LOS	With Cumulative Dev. Plus Mitigation Impact
4.	Admiralty Way and	AM	0.730	C	0.821	D	0.091 **	0.508	A	-0.222
	Via Marina	PM	0.783	C	0.915	E	0.132 **	0.546	A	-0.237
5.	Washington Boulevard and	AM	0.744	C	0.858	D	0.114 **	0.774	C	0.030
	Via Marina/Ocean Avenue	PM	0.799	C	0.918	E	0.119 **	0.807	D	0.008
6.	Admiralty Way and	AM	0.444	A	0.620	B	0.176	0.607	B	0.163
	Palawan Way	PM	0.629	B	0.809	D	0.180 **	0.658	B	0.029
7.	Washington Boulevard and	AM	0.668	B	0.935	E	0.267 **	0.671	B	0.003
	Palawan Way	PM	0.747	C	0.910	E	0.163 **	0.719	C	-0.028
8.	Washington Boulevard and	AM	0.807	D	0.947	E	0.140 **	n/a	--	--
	Lincoln Boulevard	PM	1.390	F	1.552	F	0.162 **			
9.	Lincoln Boulevard and	AM	0.707	C	0.810	D	0.103 **	n/a	--	--
	Marina Expressway (SR-90)	PM	0.751	C	0.892	D	0.141 **			
10.	Lincoln Boulevard and	AM	0.677	B	0.741	C	0.064 **	n/a	--	--
	Bali Way	PM	0.534	A	0.640	B	0.106			
11.	Lincoln Boulevard and	AM	0.754	C	0.959	E	0.205 **	n/a	--	--
	Mindanao Way	PM	0.884	D	1.049	F	0.165 **			
12.	Lincoln Boulevard and	AM	0.613	B	0.735	C	0.122 **	n/a	--	--
	Fiji Way	PM	0.762	C	0.901	E	0.139 **			
13.	Admiralty Way and	AM	0.480	A	0.605	B	0.125	0.605	B	0.125
	Bali Way	PM	0.602	B	0.740	C	0.138 **	0.579	A	-0.023
14.	Admiralty Way and	AM	0.654	B	0.889	D	0.235 **	0.655	B	0.001
	Mindanao Way	PM	0.772	C	1.013	F	0.241 **	0.787	C	0.015
17.	Marina Expressway (SR-90)	AM	0.641	B	0.783	C	0.142 **	0.624	B	-0.017
	Eastbound and Mindanao Way	PM	0.769	C	0.868	D	0.099 **	0.788	C	0.019

** Indicates significant cumulative traffic impact, prior to mitigation, per Los Angeles County Department of Public Works "Traffic Impact Analysis Report Guidelines", January 1, 1997.

"n/a" Indicates final design of proposed SR-90 extension project not available. No specific analysis of effectiveness of this measure possible at this time. However, Los Angeles County is currently preparing environmental analyses to evaluate the impacts of the proposed SR-90 extension project.

Environmental Impact Report for this roadway improvement that will identify the anticipated benefits to the Lincoln Boulevard corridor as a result of the SR-90 extension to Admiralty Way.

Condition of approval for developments within the Marina is described in the Marina del Rey LUP and summarized below:

> "Development shall not be approved that will significantly exceed the capacity of the sub-regional street system. Traffic impacts, generated by development in the LCP study area, upon the circulation system outside the unincorporated area of Marina del Rey, shall be mitigated by the developer prior to receiving final discretionary permits." *

In summary, the cumulative mitigation measures include measures specifically identified in the TIP, including funding for larger long-term improvements such as the planned Marina Expressway (SR-90) extension to Admiralty Way that will increase area-wide traffic capacity and help alleviate existing and future congestion in the study area. If these measures are not installed, significant cumulative traffic impacts may remain.

The improvements described above -- with the exceptions of the new traffic signal at Washington Boulevard and Palawan Way, the installation of the dual left-turn lanes, the traffic signal modification and the restripe of the left-turn lane to a left-through shared lane in the eastbound direction at Admiralty Way and Mindanao Way, and the installation of a free right-turn lane on Mindanao Way in the eastbound direction at the SR-90 eastbound approach -- are identical to or consistent with the area-wide roadway improvements identified in Appendix G (Transportation Improvement Program) of the Marina del Rey Local Implementation Program, and funded through payment of the

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* Marina del Rey Land Use Plan, County of Los Angeles Department of Regional Planning, C.11 Circulation, Page 11-18.

traffic impact fees. The project is responsible for its "fair share" portion of implementation of the cumulative mitigation (or other County approved) improvements through payment of the $1,297,320 trip fee, plus the pro-rata share for the added measures.

APPENDIX A

TRAFFIC ANALYSIS FOR PROPOSED RESIDENTIAL DEVELOPMENT ON PARCEL 10R

APPENDIX A

The proposed project that was described in the body of the report is composed of residential units, a hotel/timeshare resort, boat slips and a public park located on Parcels 10R, FF and 9U in Marina del Rey. For the purpose of this study, the analysis of individual components of the proposed Parcels 10R, FF and 9U project was also conducted. This appendix analyzes the traffic impacts of the residential development on Parcel 10R only, hereafter called the "proposed project" in this appendix. Specifically, the residential development on Parcel 10R consists of a total of 400 apartment units that is proposed to be developed along the south side of Marquesas Way, as well as along the east side of Via Marina south of Marquesas Way. The residential portion of Parcel 10R is currently developed with a total of 136 residential units, which would be removed in order to construct the proposed project.

The proposed project was analyzed based on the same procedures that were described in the body of the report. Applying the trip generation rates shown in Table 4, the traffic expected to be generated by the proposed project was calculated, and is summarized in Table A-1. As shown in this table, the total project (residential portion of Parcel 10R only) is expected to generate approximately 1,045 net new daily trips, including 93 net AM peak hour trips and 86 net PM peak hour trips. The project trip generation estimates were assigned to the street network based on the assignment percentages shown in Figure 4(a) for Parcel 10R. The traffic assignments for the AM and PM peak hour project traffic on the nearby street system are shown in Figures A-1(a) and A-1(b), respectively. Traffic volumes generated by the project were combined with the benchmark "Without Project (With Ambient Growth Only)" volumes shown in Figures 7(a) and 7(b) to form the "With Ambient Growth Plus Project" traffic conditions, and to determine traffic impacts directly attributable to the proposed development. The future

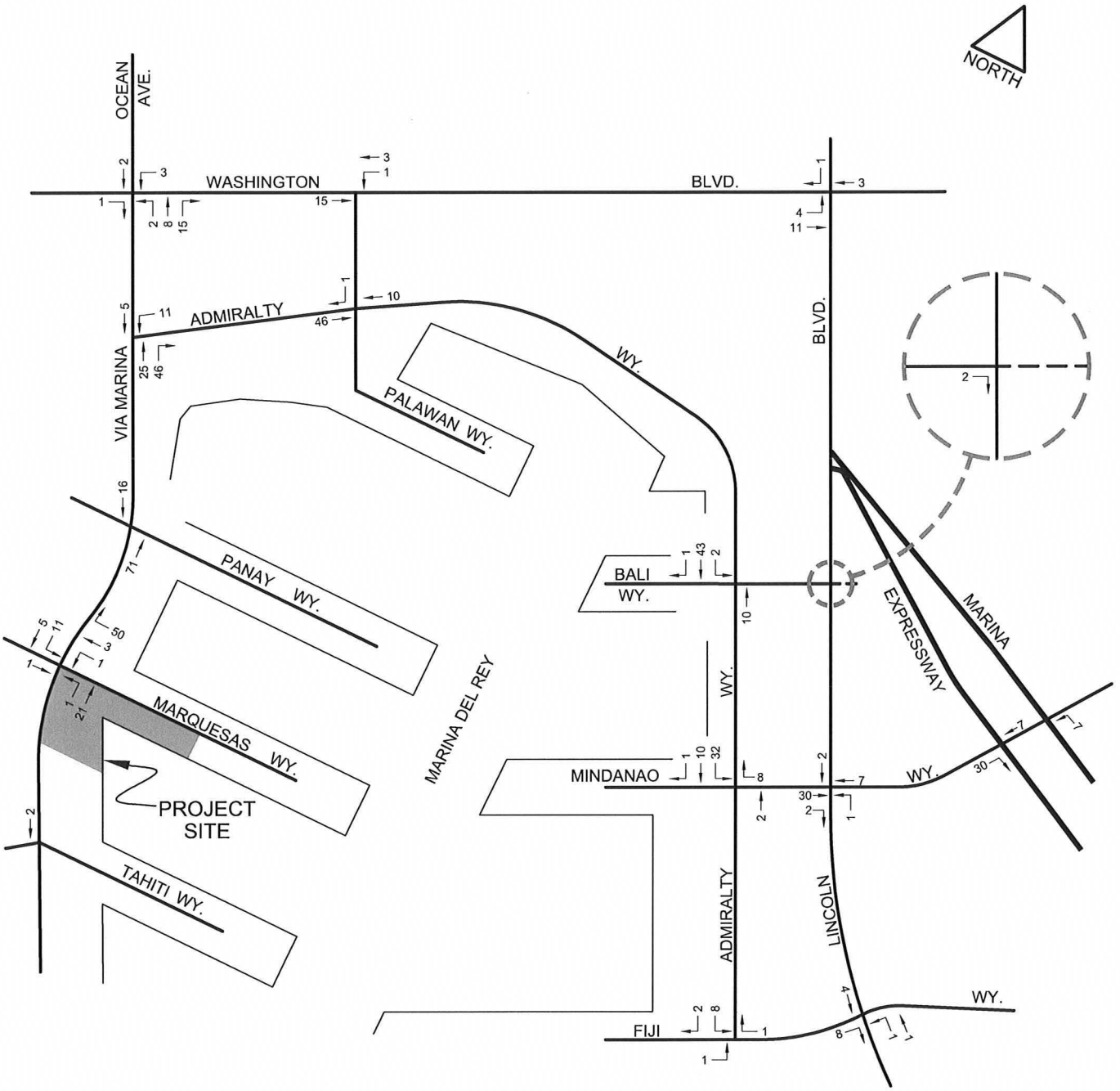
Table A-1
Project Trip Generation
(Residential Development on Parcel 10R Only)

Size/Use	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Proposed Use							
400 Apartments	1,584	25	115	140	88	42	130
Existing Uses - Removed							
136 Apartments	539	8	39	47	30	14	44
Net New Trips	***1,045***	***17***	***76***	***93***	***58***	***28***	***86***

(2013) "With Ambient Growth Plus Project" traffic volumes are shown in Figures A-2(a) and A-2(b).

Based on the future traffic volumes from Figures A-2(a) and A-2(b), and using the lane configurations in Appendix G, the CMA and level of service values were calculated and summarized in Table A-2. This table shows that the proposed project would not significantly impact any study intersections.

However, all projects within the Marina, including the proposed project, are required to pay a traffic mitigation fee imposed by the County of Los Angeles pursuant to the Marina del Rey Specific Plan Transportation Improvement Program. This fee is intended to fund the Category 1 (local Marina) and Category 3 (regional) roadway improvements described in the TIP, by providing "fair share" contributions toward the improvements, based on the amount of project PM peak hour trips. (Category 2 roadway improvements are reserved for Area A, which is DZ 15 and is part of the Playa Vista Development on the Marina.) These improvements address local traffic generated in and confined to the Marina, as well as trips which leave or pass through the Marina



APPENDIX A-1(a)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\AMNETPRJ(10R RES)

PROJECT TRAFFIC VOLUMES
PARCEL 10R (RESIDENTIAL ONLY)
AM PEAK HOUR

CRAIN & ASSOCIATES
Transportation Planning
Traffic Engineering
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Los Angeles California 90025
PH (310) 473 6508 F (310) 444 9771
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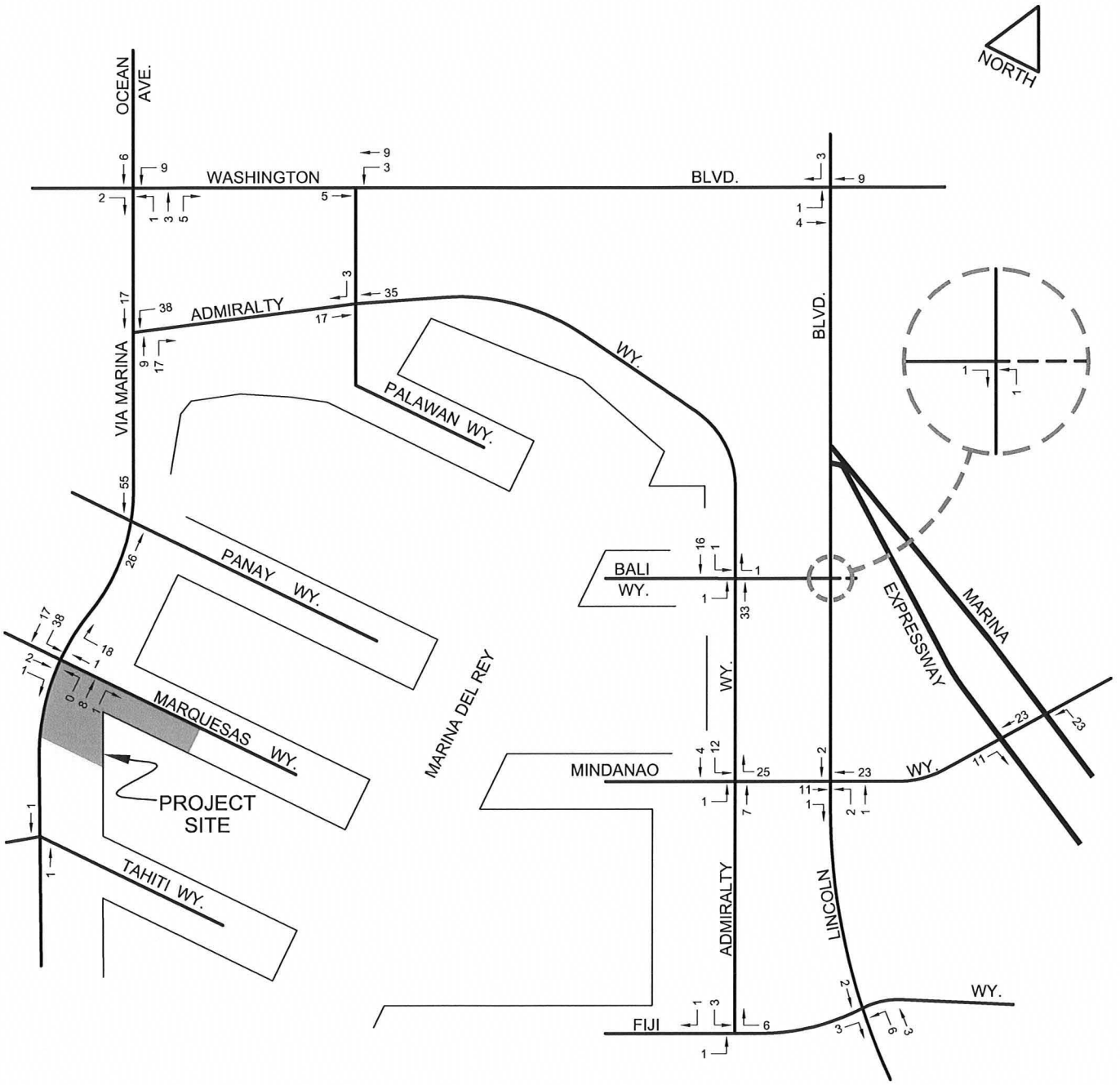

APPENDIX A-1(b)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\PMNETPRJ(10R RES)

PROJECT TRAFFIC VOLUMES
PARCEL 10R (RESIDENTIAL ONLY)
PM PEAK HOUR

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Traffic Engineering
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Los Angeles California 90025
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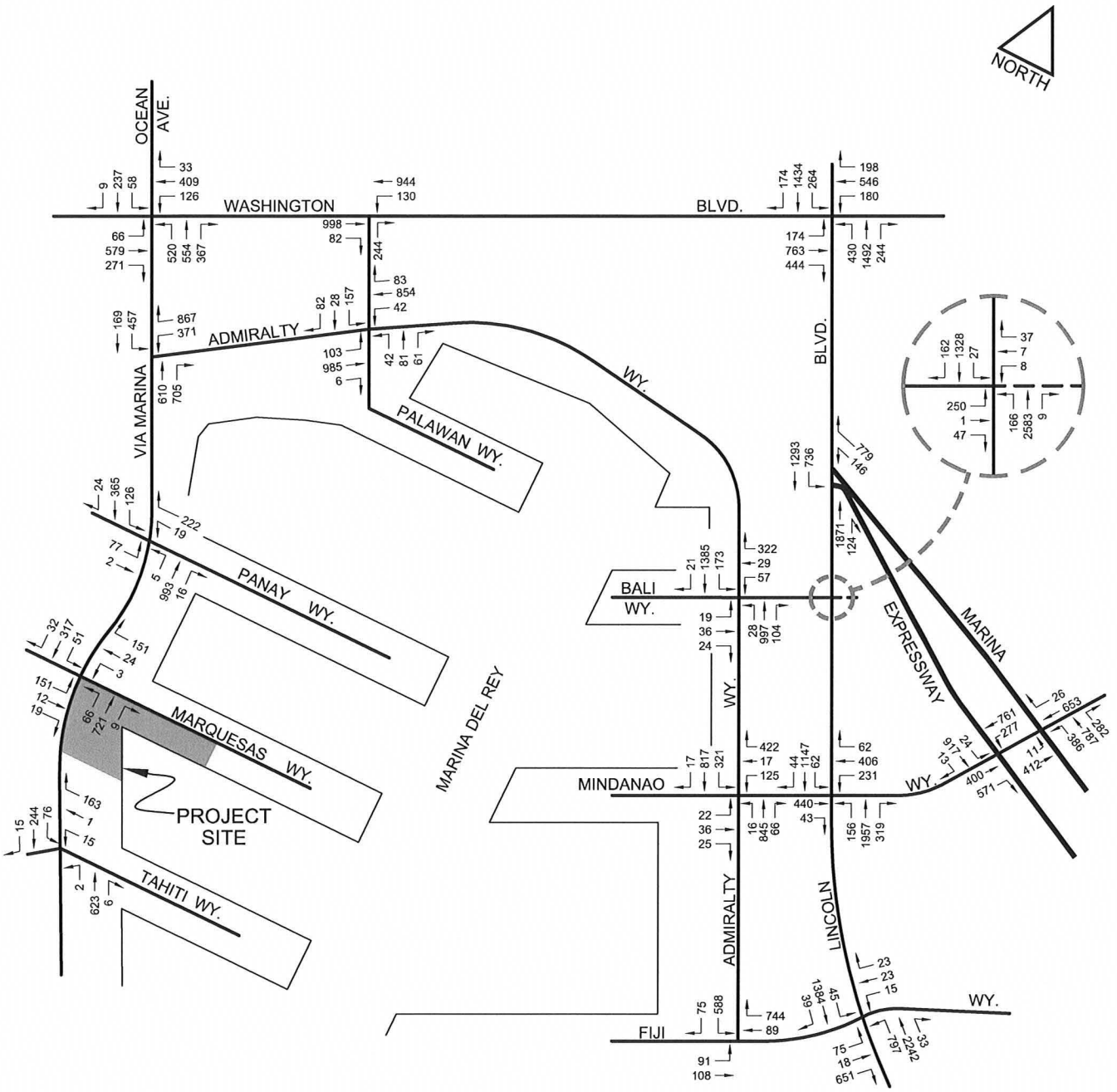

APPENDIX A-2(a)

12/3/2007

Marina del Rey Legacy\REPORT(12-2007)\AM2013WP(10R RES)

FUTURE (2013) TRAFFIC VOLUMES
WITH AMBIENT GROWTH PLUS PROJ
(PARCEL 10R, RESIDENTIAL ONLY)
AM PEAK HOUR

STICK-10R

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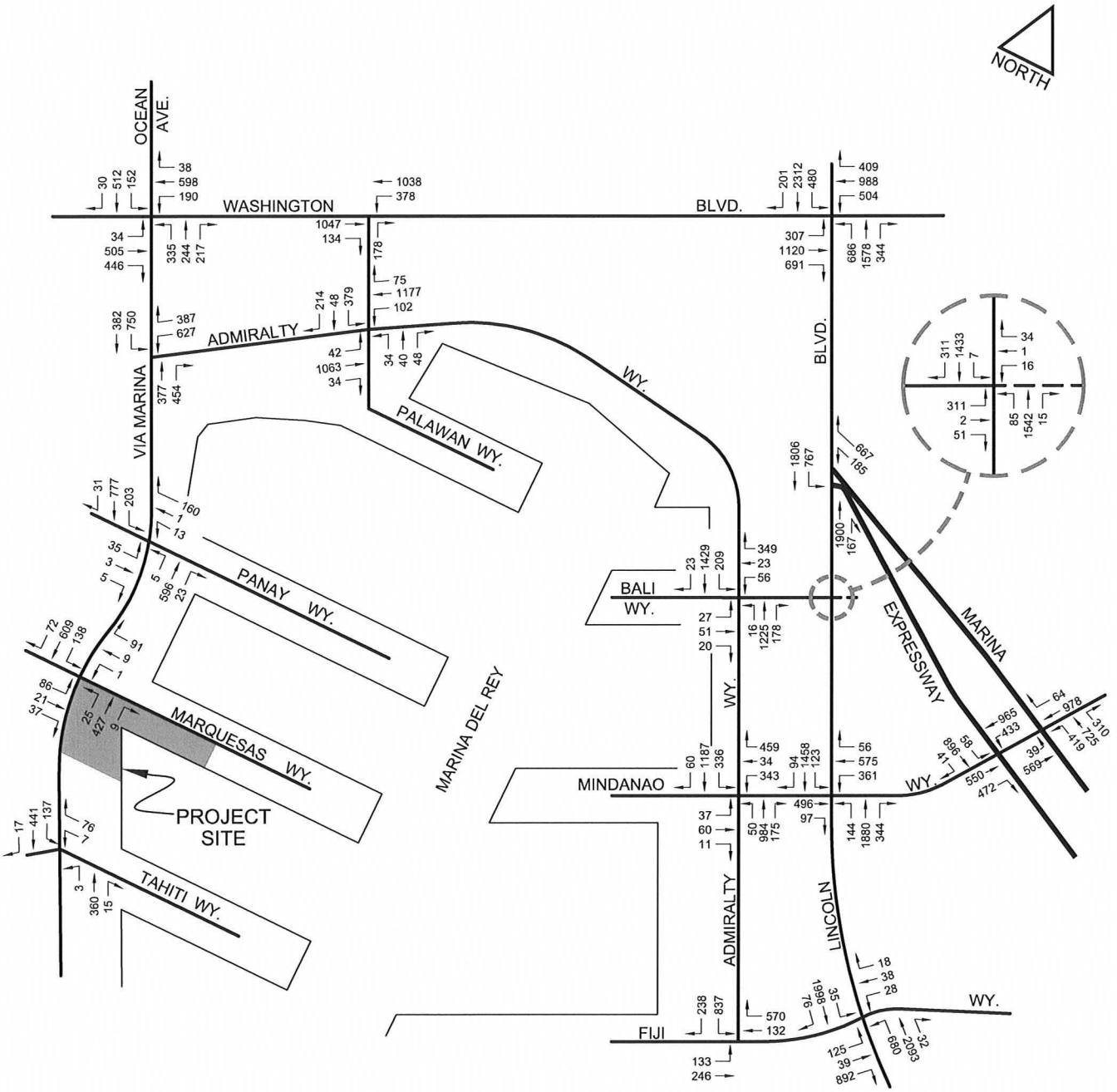

APPENDIX A-2(b)

12/3/2007

Marina del Rey Legacy\REPORT(12-2007)\PM2013WP(10R RES)

FUTURE (2013) TRAFFIC VOLUMES
WITH AMBIENT GROWTH PLUS PROJ
(PARCEL 10R, RESIDENTIAL ONLY)
PM PEAK HOUR

STICK-10R

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Table A-2
Critical Movement Analysis (CMA) Summary
Future (2013) Ambient Growth Traffic Conditions – Without and With Project
(Residential Development of Parcel 10R Only)

No.	Intersection	Peak Hour	With Ambient Growth CMA	With Ambient Growth LOS	With Ambient Growth Plus Project CMA	With Ambient Growth Plus Project LOS	Impact
1	Tahiti Way and	AM	0.276	A	0.276	A	0.000
	Via Marina	PM	0.179	A	0.179	A	0.000
2	Marquesas Way and	AM	0.271	A	0.304	A	0.033
	Via Marina	PM	0.188	A	0.209	A	0.021
3	Panay Way and	AM	0.360	A	0.372	A	0.012
	Via Marina	PM	0.263	A	0.268	A	0.005
4	Admiralty Way and	AM	0.730	C	0.739	C	0.009
	Via Marina	PM	0.783	C	0.800	C	0.017
5	Washington Boulevard and	AM	0.744	C	0.753	C	0.009
	Via Marina/Ocean Avenue	PM	0.799	C	0.812	D	0.013
6	Admiralty Way and	AM	0.444	A	0.447	A	0.003
	Palawan Way	PM	0.629	B	0.641	B	0.012
7	Washington Boulevard and	AM	0.668	B	0.673	B	0.005
	Palawan Way	PM	0.747	C	0.752	C	0.005
8	Washington Boulevard and	AM	0.807	D	0.811	D	0.004
	Lincoln Boulevard	PM	1.390	F	1.392	F	0.002
9	Lincoln Boulevard and	AM	0.707	C	0.707	C	0.000
	Marina Expressway (SR-90)	PM	0.751	C	0.751	C	0.000
10	Lincoln Boulevard and	AM	0.677	B	0.677	B	0.000
	Bali Way	PM	0.534	A	0.535	A	0.001
11	Lincoln Boulevard and	AM	0.754	C	0.765	C	0.011
	Mindanao Way	PM	0.884	D	0.888	D	0.004
12	Lincoln Boulevard and	AM	0.613	B	0.614	B	0.001
	Fiji Way	PM	0.762	C	0.765	C	0.003
13	Admiralty Way and	AM	0.480	A	0.489	A	0.009
	Bali Way	PM	0.602	B	0.616	B	0.014
14	Admiralty Way and	AM	0.654	B	0.672	B	0.018
	Mindanao Way	PM	0.772	C	0.797	C	0.025
15	Admiralty Way and	AM	0.266	A	0.268	A	0.002
	Fiji Way	PM	0.386	A	0.387	A	0.001
16	Marina Expressway (SR-90)	AM	0.423	A	0.423	A	0.000
	Westbound and Mindanao Way	PM	0.555	A	0.560	A	0.005
17	Marina Expressway (SR-90)	AM	0.641	B	0.648	B	0.007
	Eastbound and Mindanao Way	PM	0.769	C	0.772	C	0.003

(regional trips). The County's traffic mitigation fee structure is currently $5,690 per PM peak hour trip. Based on the expected net project trip generation of 86 PM peak hour trips, the proposed project would be required to pay $489,340 in trip mitigation fees. A portion of these fees is designated toward the Category 3 (regional) transportation improvements. The project would also be required to pay its fair share of the improvement to offset cumulative traffic impacts at the intersection of Washington Boulevard and Palawan Way, Admiralty Way and Mindanao Way, and Marina Expressway (SR-90) Eastbound and Mindanao Way.

It should be noted that the proposed residential development on Parcel 10R does not change the analysis of future "With Cumulative Project" traffic conditions that was described in the body of the report, as all the individual components of the combined Parcels 10R, FF and 9U project are still proposed and remain the same. Thus, no further analysis of future cumulative project conditions is required.

APPENDIX B

TRAFFIC ANALYSIS FOR PROPOSED RESIDENTIAL DEVELOPMENT ON PARCEL FF

APPENDIX B

The proposed project that was described in the body of the report is composed of residential units, a hotel/timeshare resort, boat slips and a public park located on Parcels 10R, FF and 9U in Marina del Rey. For the purpose of this study, the analysis of individual components of the proposed Parcels 10R, FF and 9U project was also conducted. This appendix analyzes the traffic impacts of the residential development on Parcel FF only, hereafter called the "proposed project" in this appendix. Specifically, the residential development on Parcel FF consists of a total of 126 apartment units that is proposed to be developed along the north side of Marquesas Way and on the east side of Via Marina. Parcel FF is currently developed with a 207-space public parking lot for use by area residents and visitors. This public parking lot would be removed in anticipation of the proposed project on Parcel FF.

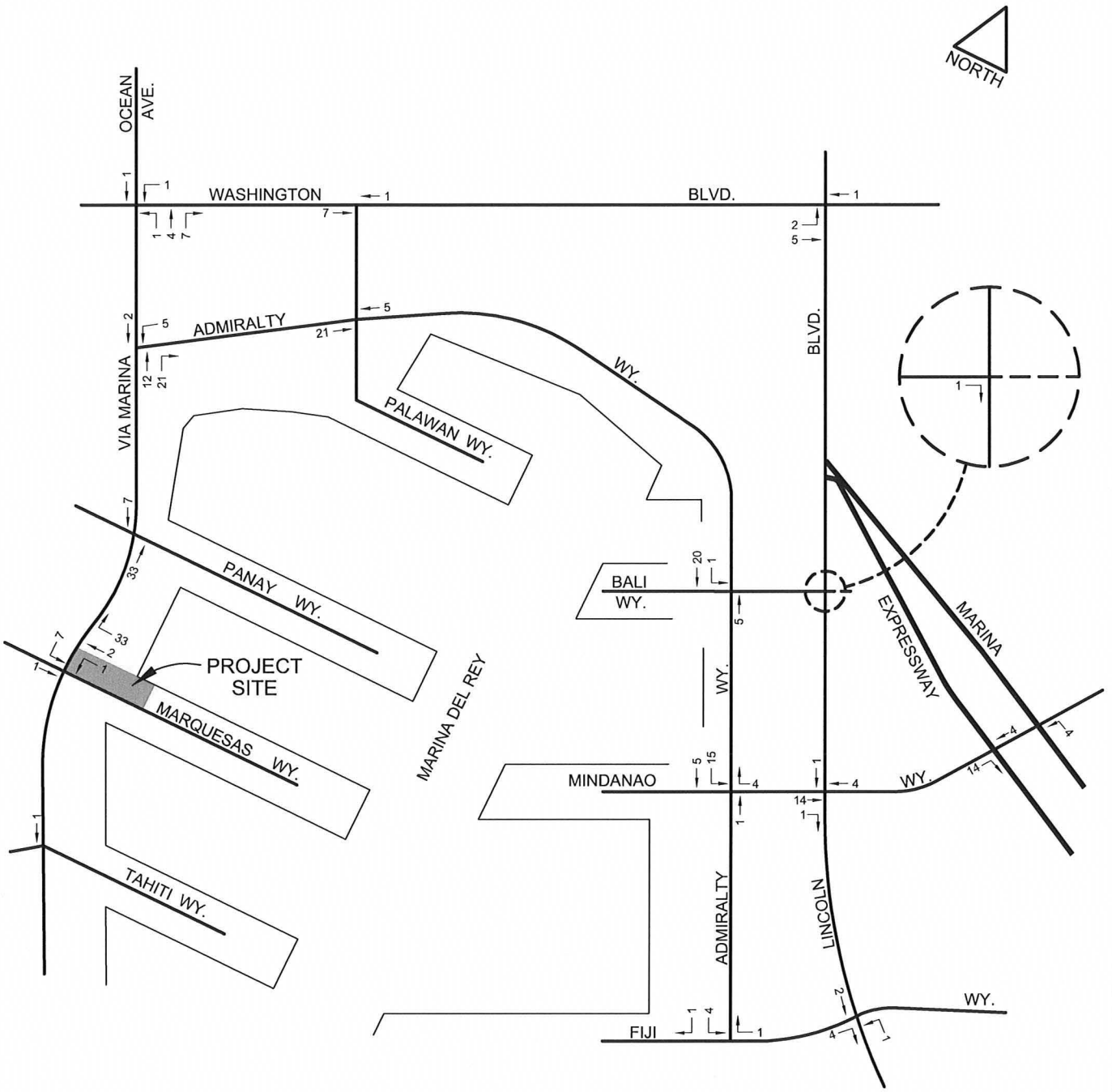
The proposed project was analyzed based on the same procedures that were described in the body of the report. Applying the trip generation rates shown in Table 4, the traffic expected to be generated by the proposed project was calculated, and is summarized in Table B-1. As shown in this table, the total project (residential portion of Parcel FF only) is expected to generate approximately 499 net new daily trips, including 44 net AM peak hour trips and 41 net PM peak hour trips. The project trip generation estimates were assigned to the street network based on the assignment percentages shown in Figure 4(b) for Parcel FF. The traffic assignments for the AM and PM peak hour project traffic on the nearby street system are shown in Figures B-1(a) and B-1(b), respectively. Traffic volumes generated by the project were combined with the benchmark "Without Project (With Ambient Growth Only)" volumes shown in Figures 7(a) and 7(b) to form the "With Ambient Growth Plus Project" traffic conditions, and to determine traffic impacts directly attributable to the proposed development. The future (2013) "With Ambient Growth Plus Project" traffic volumes are shown in Figures B-2(a) and B-2(b).

Table B-1
Project Trip Generation
(Residential Development on Parcel FF Only)

Size/Use	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Proposed Use							
126 Apartments	499	8	36	44	28	13	41
Existing Uses - Removed							
None	0	0	0	0	0	0	0
Net New Trips	***499***	***8***	***36***	***44***	***28***	***13***	***41***

Based on the future traffic volumes from Figures B-2(a) and B-2(b), and using the lane configurations in Appendix G, the CMA and level of service values were calculated and summarized in Table B-2. This table shows that the proposed project would not significantly impact any study intersections.

However, all projects within the Marina, including the proposed project, are required to pay a traffic mitigation fee imposed by the County of Los Angeles pursuant to the Marina del Rey Specific Plan Transportation Improvement Program. This fee is intended to fund the Category 1 (local Marina) and Category 3 (regional) roadway improvements described in the TIP, by providing "fair share" contributions toward the improvements, based on the amount of project PM peak hour trips. (Category 2 roadway improvements are reserved for Area A, which is DZ 15 and is part of the Playa Vista Development on the Marina.) These improvements address local traffic generated in and confined to the Marina, as well as trips which leave or pass through the Marina (regional trips). The County's traffic mitigation fee structure is currently $5,690 per PM peak hour trip. Based on the expected net project trip generation of 41 PM peak hour



APPENDIX B-1(a)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\AMNETPRJ(FF)

PROJECT TRAFFIC VOLUMES
PARCEL FF ONLY
AM PEAK HOUR

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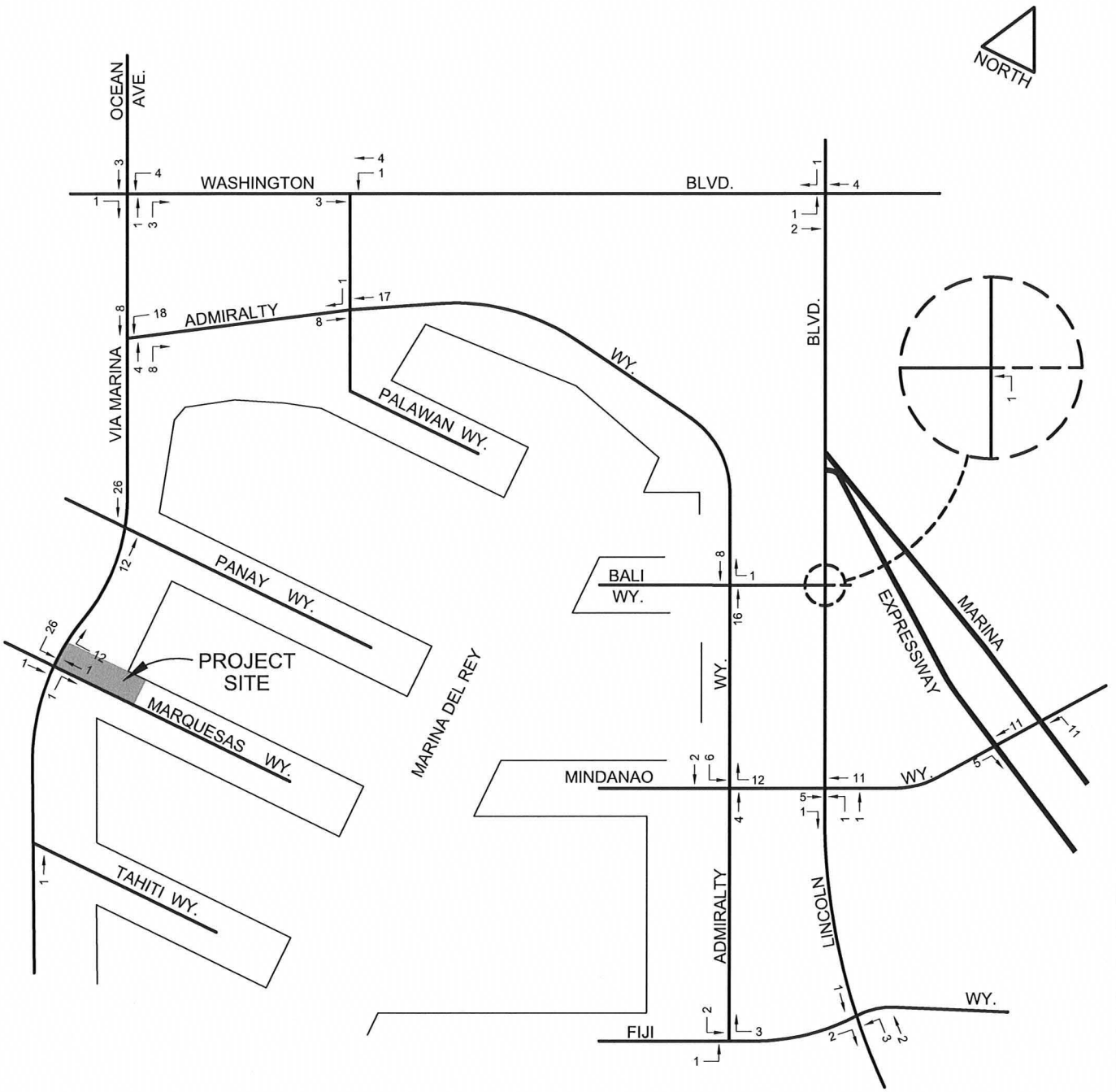

APPENDIX B-1(b)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\PMNETPRJ(FF)

PROJECT TRAFFIC VOLUMES
PARCEL FF ONLY
PM PEAK HOUR

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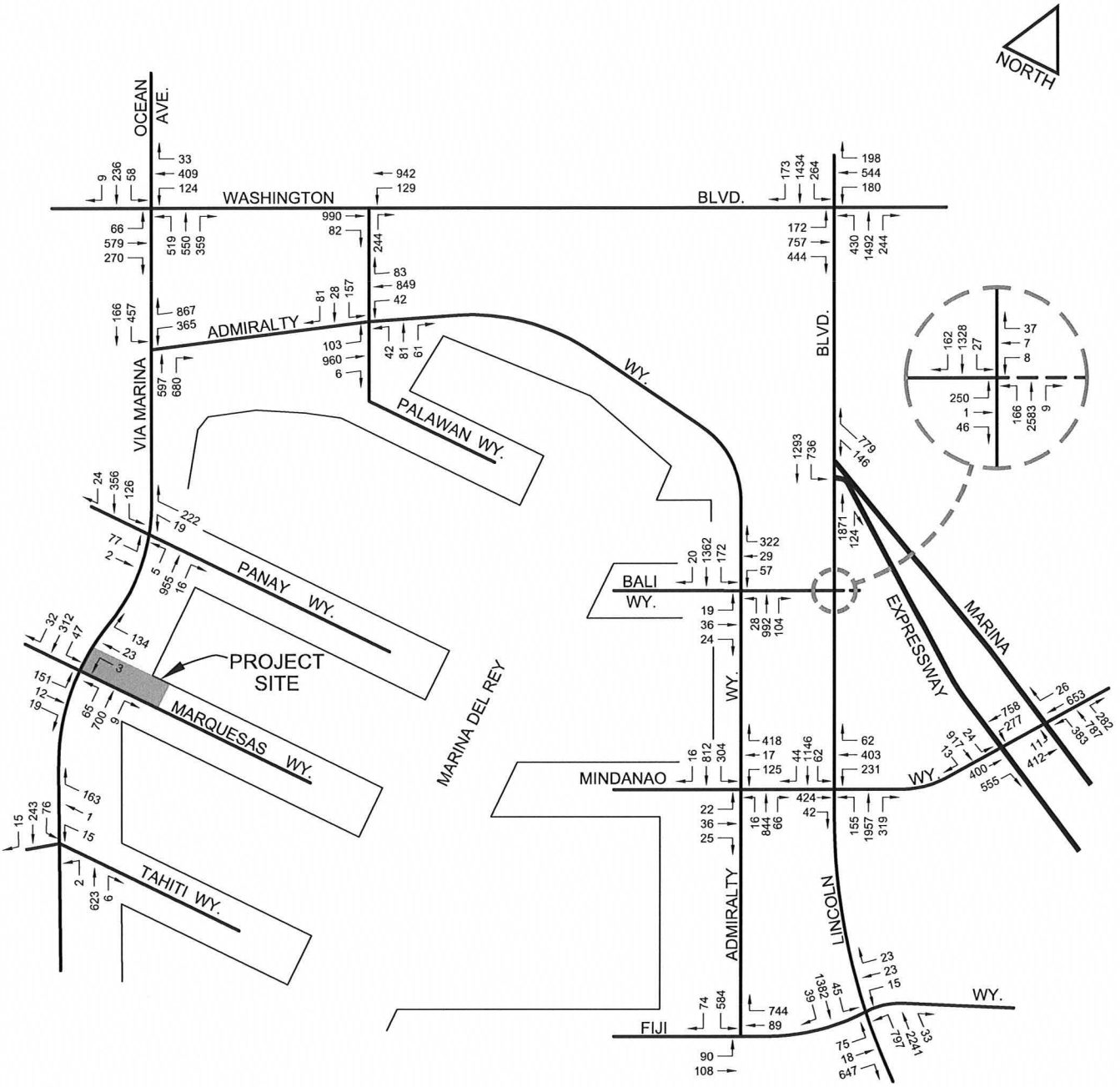

APPENDIX B-2(a)

12/3/2007

Marina del Rey Legacy\REPORT(12-2007)\AM2013WP(FF)

STICK-FF

FUTURE (2013) TRAFFIC VOLUMES
WITH AMBIENT GROWTH PLUS PROJ(PARCEL FF)
AM PEAK HOUR

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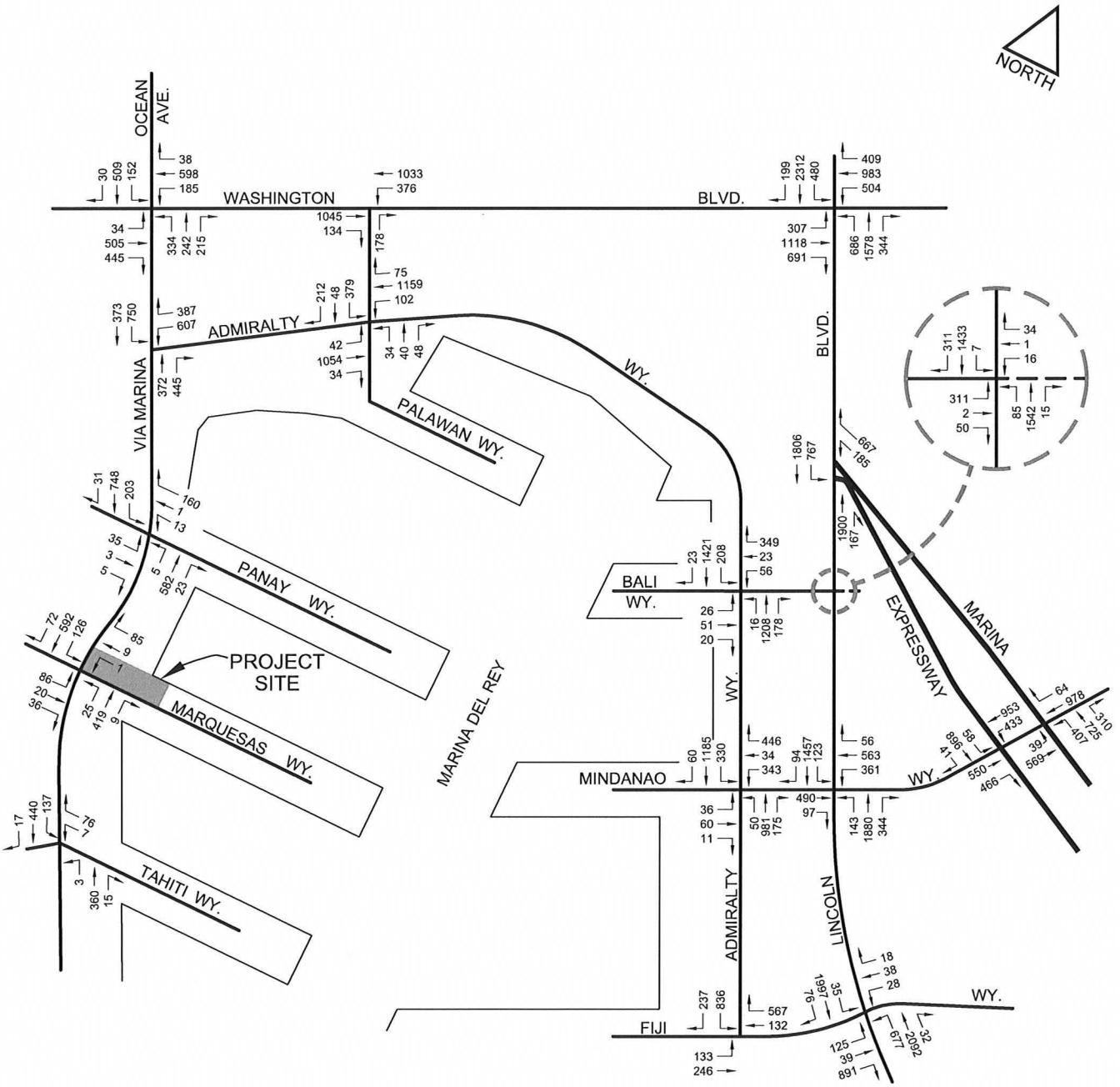

APPENDIX B-2(b)

12/3/2007

Marina del Rey Legacy\REPORT(12-2007)\PM2013WP(FF)

STICK-FF

FUTURE (2013) TRAFFIC VOLUMES
WITH AMBIENT GROWTH PLUS PROJ(PARCEL FF)
PM PEAK HOUR

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Table B-2
Critical Movement Analysis (CMA) Summary
Future (2013) Ambient Growth Traffic Conditions – Without and With Project
(Residential Development of Parcel FF Only)

No.	Intersection	Peak Hour	With Ambient Growth CMA	With Ambient Growth LOS	With Ambient Growth Plus Project CMA	With Ambient Growth Plus Project LOS	Impact
1	Tahiti Way and	AM	0.276	A	0.276	A	0.000
	Via Marina	PM	0.179	A	0.179	A	0.000
2	Marquesas Way and	AM	0.271	A	0.290	A	0.019
	Via Marina	PM	0.188	A	0.201	A	0.013
3	Panay Way and	AM	0.360	A	0.366	A	0.006
	Via Marina	PM	0.263	A	0.266	A	0.003
4	Admiralty Way and	AM	0.730	C	0.734	C	0.004
	Via Marina	PM	0.783	C	0.791	C	0.008
5	Washington Boulevard and	AM	0.744	C	0.748	C	0.004
	Via Marina/Ocean Avenue	PM	0.799	C	0.805	D	0.006
6	Admiralty Way and	AM	0.444	A	0.445	A	0.001
	Palawan Way	PM	0.629	B	0.635	B	0.006
7	Washington Boulevard and	AM	0.668	B	0.670	B	0.002
	Palawan Way	PM	0.747	C	0.748	C	0.001
8	Washington Boulevard and	AM	0.807	D	0.808	D	0.001
	Lincoln Boulevard	PM	1.390	F	1.391	F	0.001
9	Lincoln Boulevard and	AM	0.707	C	0.707	C	0.000
	Marina Expressway (SR-90)	PM	0.751	C	0.751	C	0.000
10	Lincoln Boulevard and	AM	0.677	B	0.677	B	0.000
	Bali Way	PM	0.534	A	0.535	A	0.001
11	Lincoln Boulevard and	AM	0.754	C	0.759	C	0.005
	Mindanao Way	PM	0.884	D	0.887	D	0.003
12	Lincoln Boulevard and	AM	0.613	B	0.614	B	0.001
	Fiji Way	PM	0.762	C	0.763	C	0.001
13	Admiralty Way and	AM	0.480	A	0.482	A	0.002
	Bali Way	PM	0.602	B	0.608	B	0.006
14	Admiralty Way and	AM	0.654	B	0.662	B	0.008
	Mindanao Way	PM	0.772	C	0.784	C	0.012
15	Admiralty Way and	AM	0.266	A	0.267	A	0.001
	Fiji Way	PM	0.386	A	0.387	A	0.001
16	Marina Expressway (SR-90)	AM	0.423	A	0.423	A	0.000
	Westbound and Mindanao Way	PM	0.555	A	0.558	A	0.003
17	Marina Expressway (SR-90)	AM	0.641	B	0.644	B	0.003
	Eastbound and Mindanao Way	PM	0.769	C	0.770	C	0.001

trips, the proposed project would be required to pay $233,290 in trip mitigation fees. A portion of these fees is designated toward the Category 3 (regional) transportation improvements The project would also be required to pay its fair share of the improvement to offset cumulative traffic impacts at the intersection of Washington Boulevard and Palawan Way, Admiralty Way and Mindanao Way, and Marina Expressway (SR-90) Eastbound and Mindanao Way.

It should be noted that the proposed residential development on Parcel FF does not change the analysis of future "With Cumulative Project" traffic conditions that was described in the body of the report, as all the individual components of the combined Parcels 10R, FF and 9U project are still proposed and remain the same. Thus, no further analysis of future cumulative project conditions is required.

APPENDIX C

TRAFFIC ANALYSIS FOR PROPOSED HOTEL/

TIMESHARE RESORT DEVELOPMENT ON PARCEL 9U

APPENDIX C

The proposed project that was described in the body of the report is composed of residential units, a hotel/timeshare resort, boat slips and a public park located on Parcels 10R, FF and 9U in Marina del Rey. For the purpose of this study, the analysis of individual components of the proposed Parcels 10R, FF and 9U project was also conducted. This appendix analyzes the traffic impacts of the hotel/timeshare resort development on Parcel 9U only, hereafter called the "proposed project" in this appendix. Specifically, the 288-unit hotel/timeshare resort would be developed on the northern portion of Parcel 9U on approximately 2.56 acres, which is located north of Tahiti Way and on the east side of Via Marina. The hotel/timeshare resort would consist of 152 hotel suites and 136 timeshare suites as well as amenities including 6,105 square feet of restaurant and bar lounge seating areas, 3,400 square feet of meeting rooms, 5,200 square feet of ballroom uses, 5,555 square feet of spa use, and a 1,176 square foot sundry shop. The amenities would primarily serve guests of the hotel/timeshare resort. Parcel 9U is currently vacant

The proposed project was analyzed based on the same procedures that were described in the body of the report. Applying the trip generation rates shown in Table 4, the traffic expected to be generated by the proposed hotel/timeshare resort was calculated, and is summarized in Table C-1. As shown in this table, the total project (hotel/timeshare resort portion of Parcel 9U only) is expected to generate approximately 1,538 net new daily trips, including 117 net AM peak hour trips and 102 net PM peak hour trips. The project trip generation estimates were assigned to the street network based on the assignment percentages shown in Figure 4(c) for Parcel 9U. The traffic assignments for the AM and PM peak hour project traffic on the nearby street system are shown in Figures C-1(a) and C-1(b), respectively. Traffic volumes generated by the project were combined with the benchmark "Without Project (With Ambient Growth Only)" volumes

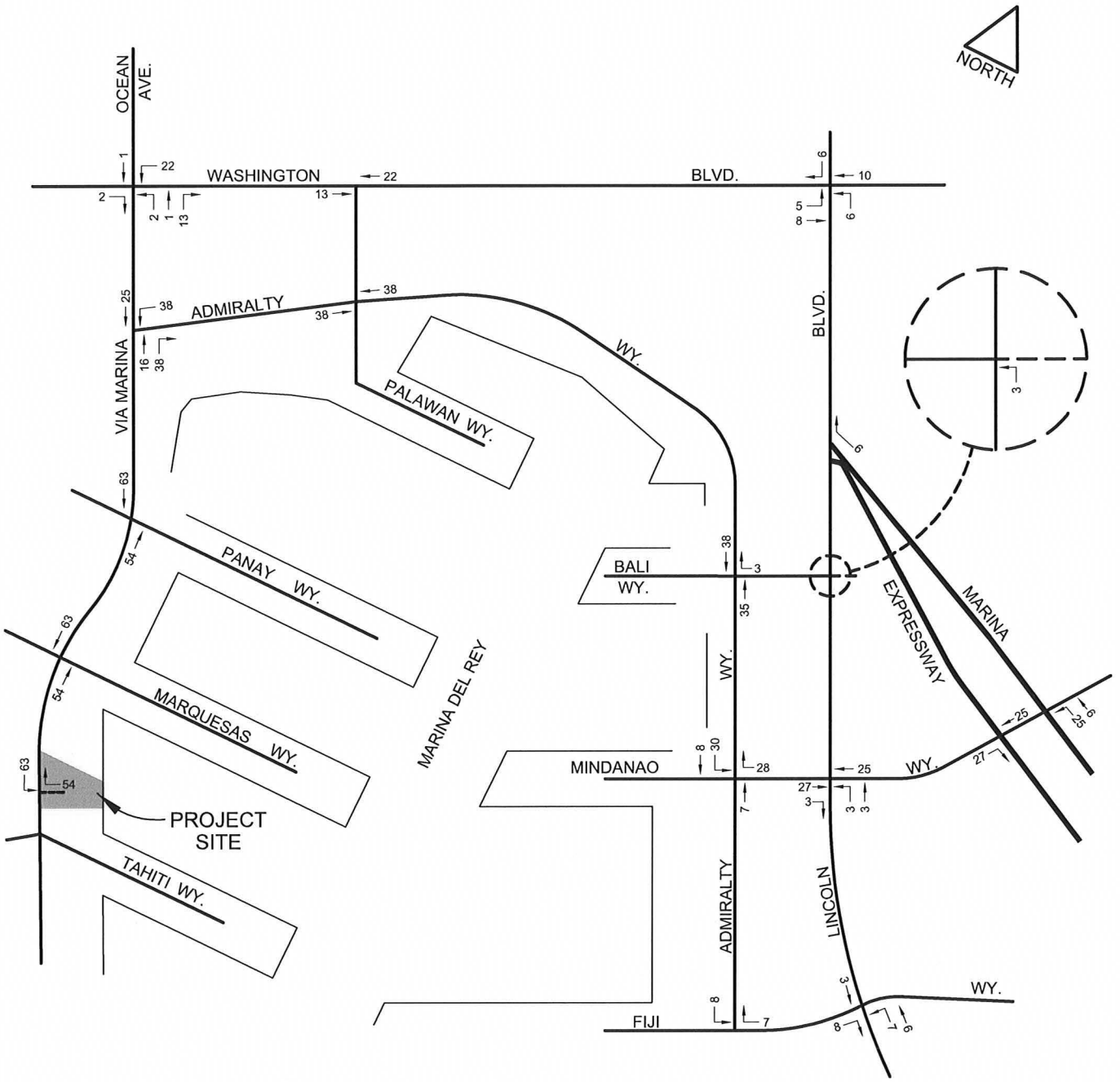
Table C-1
Project Trip Generation
(Hotel/Timeshare Resort Development on Parcel 9U Only)

Size/Use	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Proposed Use							
288 -Suite Hotel	1,538	63	54	117	46	56	102
Existing Uses - Removed							
None	0	0	0	0	0	0	0
Net New Trips	***1,538***	***63***	***54***	***117***	***46***	***56***	***102***

shown in Figures 7(a) and 7(b) to form the "With Ambient Growth Plus Project" traffic conditions, and to determine traffic impacts directly attributable to the proposed development. The future (2013) "With Ambient Growth Plus Project" traffic volumes are shown in Figures C-2(a) and C-2(b).

Based on the future traffic volumes from Figures C-2(a) and C-2(b), and using the lane configurations in Appendix G, the CMA and level of service values were calculated and summarized in Table C-2. This table shows that the proposed project would not significantly impact any study intersections.

However, all projects within the Marina, including the proposed project, are required to pay a traffic mitigation fee imposed by the County of Los Angeles pursuant to the Marina del Rey Specific Plan Transportation Improvement Program. This fee is intended to fund the Category 1 (local Marina) and Category 3 (regional) roadway improvements described in the TIP, by providing "fair share" contributions toward the improvements, based on the amount of project PM peak hour trips. (Category 2 roadway improvements are reserved for Area A, which is DZ 15 and is part of the Playa Vista Development on the Marina.) These improvements address local traffic generated



APPENDIX C-1(a)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\AMNETPRJ(9U-HOTEL)

PROJECT TRAFFIC VOLUMES
PARCEL 9U (HOTEL ONLY)
AM PEAK HOUR

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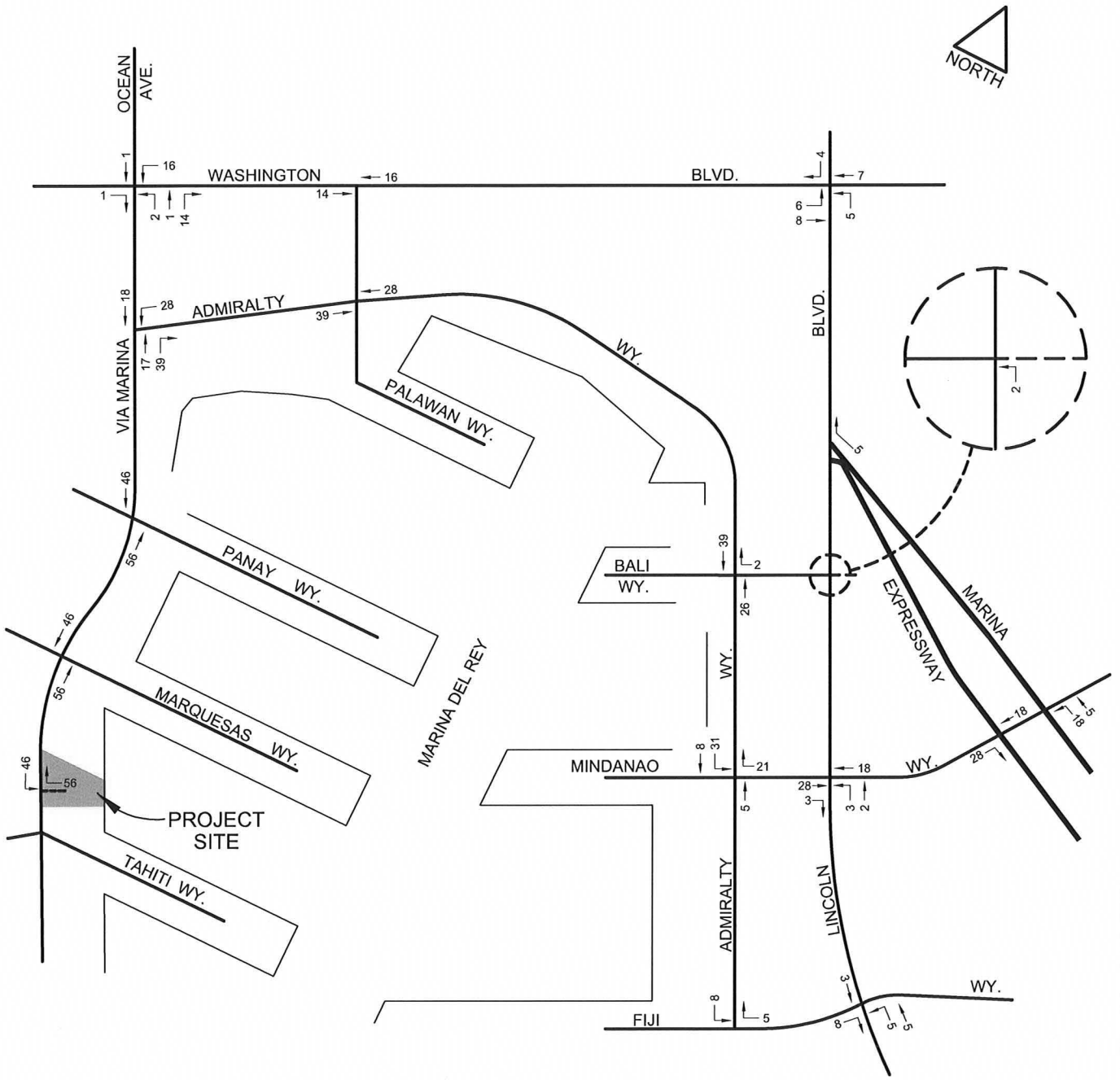

APPENDIX C-1(b)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\PMNETPRJ(9U-HOTEL)

PROJECT TRAFFIC VOLUMES
PARCEL 9U (HOTEL ONLY)
PM PEAK HOUR

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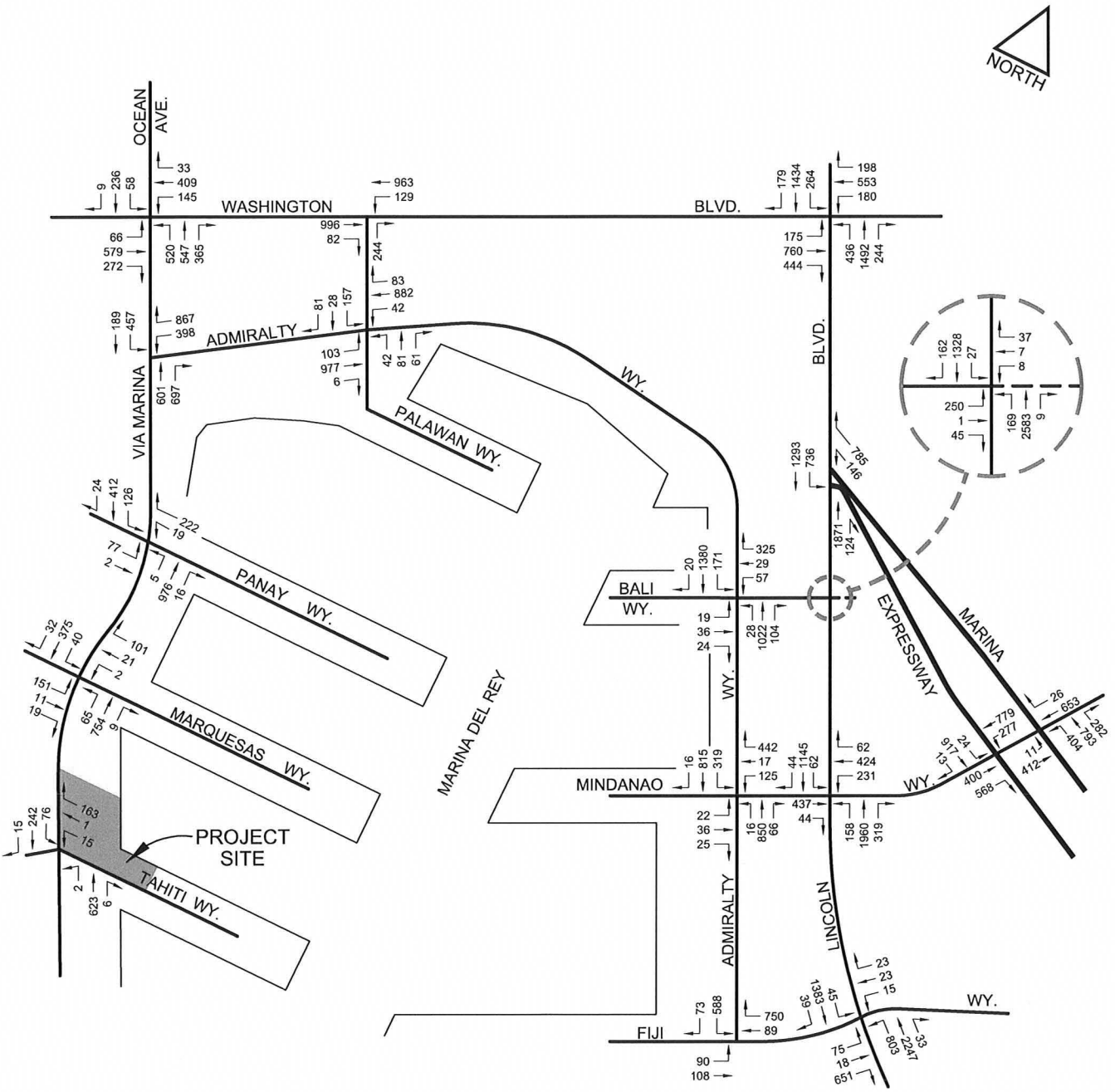

APPENDIX C-2(a)

12/3/2007

Marina del Rey Legacy\REPORT(12-2007)\AM2013WP(9U HOTEL)

FUTURE (2013) TRAFFIC VOLUMES
WITH AMBIENT GROWTH PLUS PROJ
(PARCEL 9U, HOTEL ONLY)
AM PEAK HOUR

STICK-9U(HOTEL)

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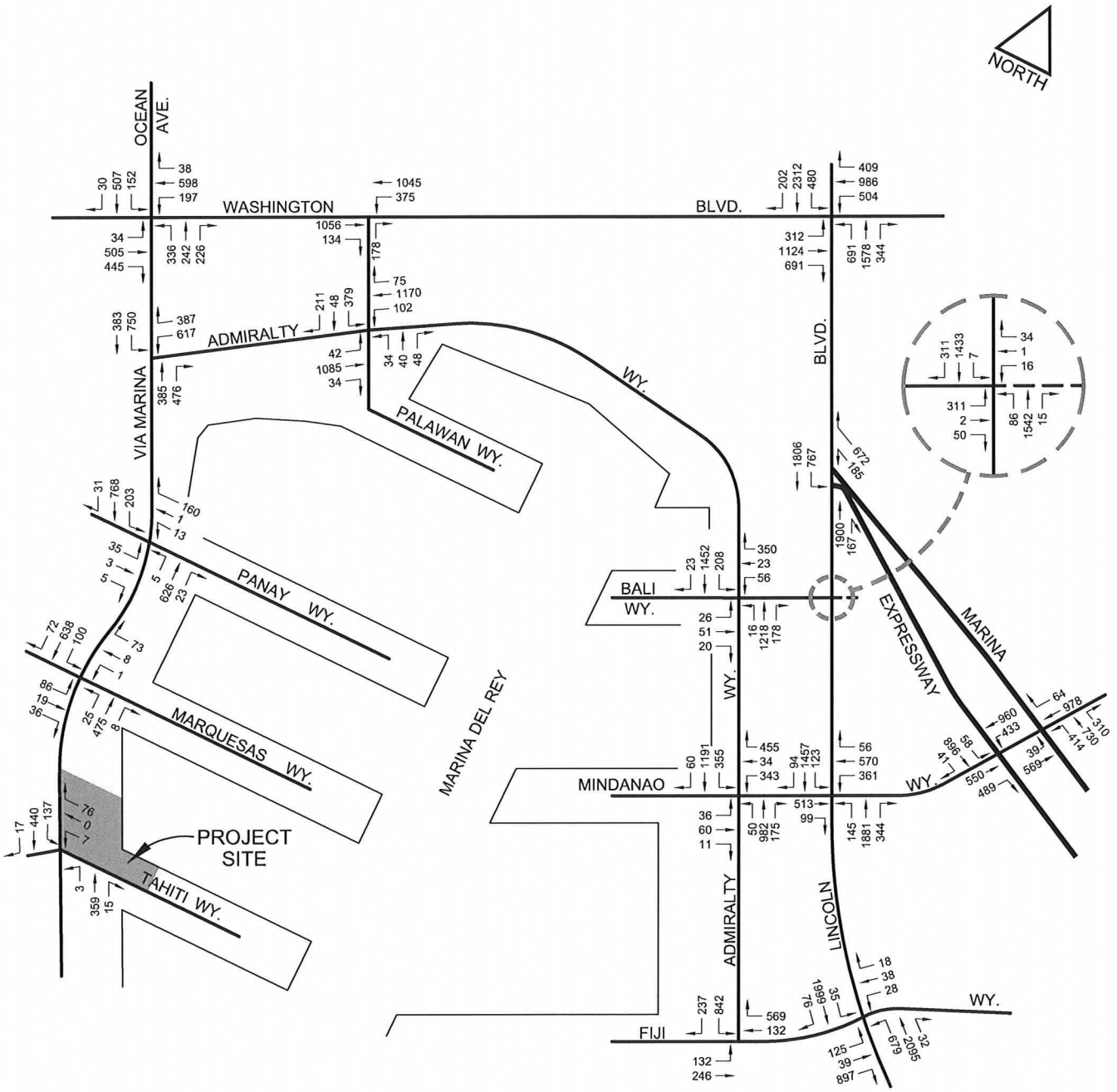

APPENDIX C-2(b)

12/3/2007

Marina del Rey Legacy\REPORT(12-2007)\PM2013WP(9U HOTEL)

FUTURE (2013) TRAFFIC VOLUMES
WITH AMBIENT GROWTH PLUS PROJ
(PARCEL 9U, HOTEL ONLY)
PM PEAK HOUR

STICK-9U(HOTEL)

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Table C-2
Critical Movement Analysis (CMA) Summary
Future (2013) Ambient Growth Traffic Conditions – Without and With Project
(Hotel/Timeshare Resort Development of Parcel 9U Only)

No.	Intersection	Peak Hour	With Ambient Growth CMA	With Ambient Growth LOS	With Ambient Growth Plus Project CMA	With Ambient Growth Plus Project LOS	Impact
1	Tahiti Way and	AM	0.276	A	0.276	A	0.000
	Via Marina	PM	0.179	A	0.179	A	0.000
2	Marquesas Way and	AM	0.271	A	0.281	A	0.010
	Via Marina	PM	0.188	A	0.198	A	0.010
3	Panay Way and	AM	0.360	A	0.370	A	0.010
	Via Marina	PM	0.263	A	0.273	A	0.010
4	Admiralty Way and	AM	0.730	C	0.736	C	0.006
	Via Marina	PM	0.783	C	0.799	C	0.016
5	Washington Boulevard and	AM	0.744	C	0.760	C	0.016
	Via Marina/Ocean Avenue	PM	0.799	C	0.812	D	0.013
6	Admiralty Way and	AM	0.444	A	0.456	A	0.012
	Palawan Way	PM	0.629	B	0.638	B	0.009
7	Washington Boulevard and	AM	0.668	B	0.673	B	0.005
	Palawan Way	PM	0.747	C	0.752	C	0.005
8	Washington Boulevard and	AM	0.807	D	0.814	D	0.007
	Lincoln Boulevard	PM	1.390	F	1.396	F	0.006
9	Lincoln Boulevard and	AM	0.707	C	0.707	C	0.000
	Marina Expressway (SR-90)	PM	0.751	C	0.751	C	0.000
10	Lincoln Boulevard and	AM	0.677	B	0.677	B	0.000
	Bali Way	PM	0.534	A	0.536	A	0.002
11	Lincoln Boulevard and	AM	0.754	C	0.765	C	0.011
	Mindanao Way	PM	0.884	D	0.896	D	0.012
12	Lincoln Boulevard and	AM	0.613	B	0.616	B	0.003
	Fiji Way	PM	0.762	C	0.765	C	0.003
13	Admiralty Way and	AM	0.480	A	0.493	A	0.013
	Bali Way	PM	0.602	B	0.612	B	0.010
14	Admiralty Way and	AM	0.654	B	0.686	B	0.032
	Mindanao Way	PM	0.772	C	0.799	C	0.027
15	Admiralty Way and	AM	0.266	A	0.268	A	0.002
	Fiji Way	PM	0.386	A	0.388	A	0.002
16	Marina Expressway (SR-90)	AM	0.423	A	0.426	A	0.003
	Westbound and Mindanao Way	PM	0.555	A	0.560	A	0.005
17	Marina Expressway (SR-90)	AM	0.641	B	0.647	B	0.006
	Eastbound and Mindanao Way	PM	0.769	C	0.775	C	0.006

in and confined to the Marina, as well as trips which leave or pass through the Marina (regional trips). The County's traffic mitigation fee structure is currently $5,690 per PM peak hour trip. Based on the expected net project trip generation of 102 PM peak hour trips, the proposed project would be required to pay $580,380 in trip mitigation fees. A portion of these fees is designated toward the Category 3 (regional) transportation improvements. The project would also be required to pay its fair share of the improvement to offset cumulative traffic impacts at the intersection of Washington Boulevard and Palawan Way, Admiralty Way and Mindanao Way, and Marina Expressway (SR-90) Eastbound and Mindanao Way.

It should be noted that the proposed hotel/timeshare resort development on Parcel 9U does not change the analysis of future "With Cumulative Project" traffic conditions that was described in the body of the report, as all the individual components of the combined Parcels 10R, FF and 9U project are still proposed and remain the same. Thus, no further analysis of future cumulative project conditions is required.

APPENDIX D

TRAFFIC ANALYSIS FOR PROPOSED BOAT SLIP DEVELOPMENT ON PARCELS 10R AND FF

APPENDIX D

The proposed project that was described in the body of the report is composed of residential units, a hotel/timeshare resort, boat slips and a public park located on Parcels 10R, FF and 9U in Marina del Rey. For the purpose of this study, the analysis of individual components of the proposed Parcels 10R, FF and 9U project was also conducted. This appendix analyzes the traffic impacts of the boat slip development on Parcels 10R and FF, hereafter called the "proposed project" in this appendix. Specifically, the proposed project consists of a total of 174 boat slips including 161 boat slips and 13 end tie spaces on the water portion of Parcel 10R within Marina Basin B. The water portion of Parcel 10R within Marina Basin B is currently developed with at least 184 boat spaces, which would be removed in order to construct the proposed project. In addition, the proposed project includes the construction of a public/transient anchorage accommodating berthing space for between seven and 11 public/transient boats (depending on the vessels' relative sizes) and dinghy moorage area. This public anchorage would be situated adjacent to the Parcel 9U bulkhead within Marina del Rey Basin, adjacent to and southerly of the 174 proposed boat slips. It should be noted that the public/transient boat spaces, being transient by nature, are not expected to generate additional vehicle trips. The proposed project would result in a net decrease of at least 10 boat spaces on the water portion of Parcel 10R and an increase of between seven and 11 public/transient boat spaces on the water portion of Parcel FF.

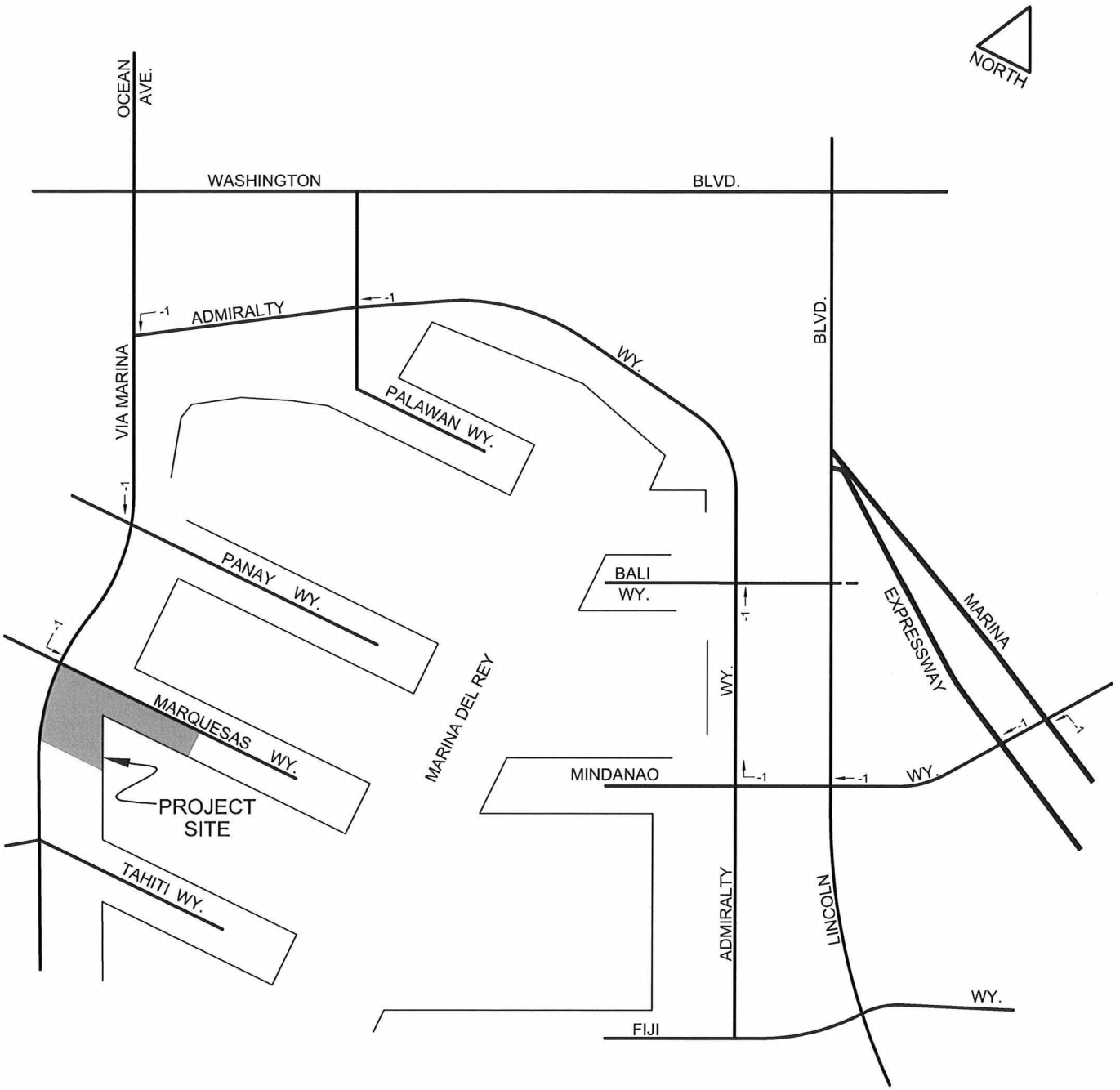
The proposed project was analyzed based on the same procedures that were described in the body of the report. Applying the trip generation rates shown in Table 4, the traffic expected to be generated by the proposed project was calculated, and is summarized in Table D-1. As shown in this table, the total project (boat slip portion of Parcels 10R and FF) is expected to result in a decrease of approximately 28 net daily trips, including

Table D-1
Project Trip Generation
(Boat Slip Development on Parcel 10R Only)

Size/Use	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Proposed Uses							
174 Boat Slips	502	7	15	22	9	15	24
Existing Uses - Removed							
184 Boat Slips	530	8	15	23	9	16	25
Net New Trips	***(28)***	***(1)***	***0***	***(1)***	***0***	***(1)***	***(1)***

a decrease of 1 net trip during both the AM and PM peak hours. The project trip generation estimates were assigned to the street network based on the assignment percentages shown in Figure 4(a) for Parcel 10R. The traffic assignments for the AM and PM peak hour project traffic on the nearby street system are shown in Figures D-1(a) and D-1(b), respectively. Traffic volumes generated by the project were combined with the benchmark "Without Project (With Ambient Growth Only)" volumes shown in Figures 7(a) and 7(b) to form the "With Ambient Growth Plus Project" traffic conditions, and to determine traffic impacts directly attributable to the proposed development. The future (2013) "With Ambient Growth Plus Project" traffic volumes are shown in Figures D-2(a) and D-2(b).

Based on the future traffic volumes from Figures D-2(a) and D-2(b), and using the lane configurations in Appendix G, the CMA and level of service values were calculated and summarized in Table D-2. This table shows that the proposed project would not significantly impact any study intersections.



APPENDIX D-1(a)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\AMNETPRJ(10R SLIPS)

PROJECT TRAFFIC VOLUMES
PARCEL 10R (BOAT SLIPS ONLY)
AM PEAK HOUR

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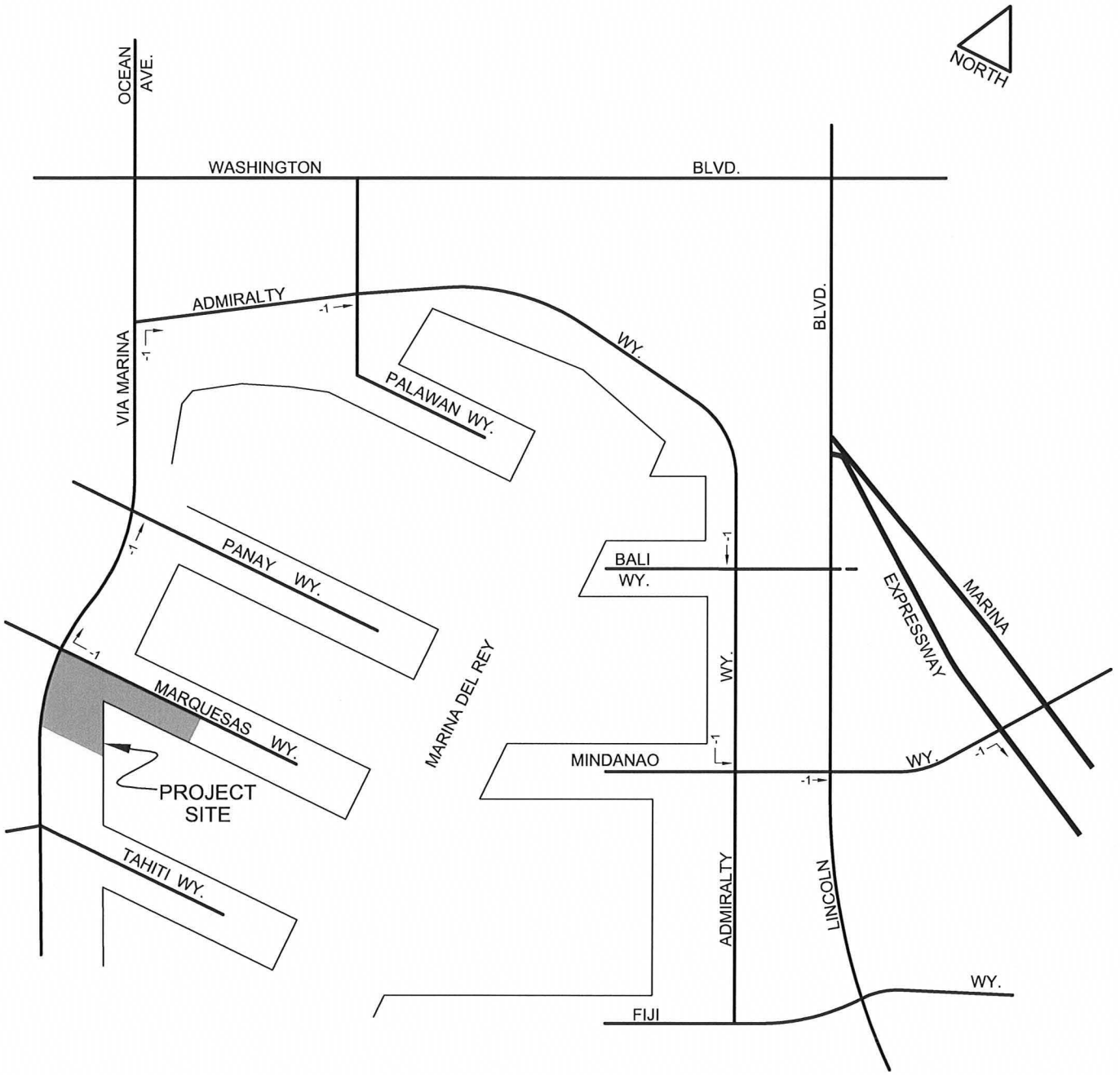

APPENDIX D-1(b)

2/15/2007

FN: MARINA DEL REY LEGACY\REPORT(2-2007)\PMNETPRJ(10R SLIPS)

PROJECT TRAFFIC VOLUMES
PARCEL 10R (BOAT SLIPS ONLY)
PM PEAK HOUR

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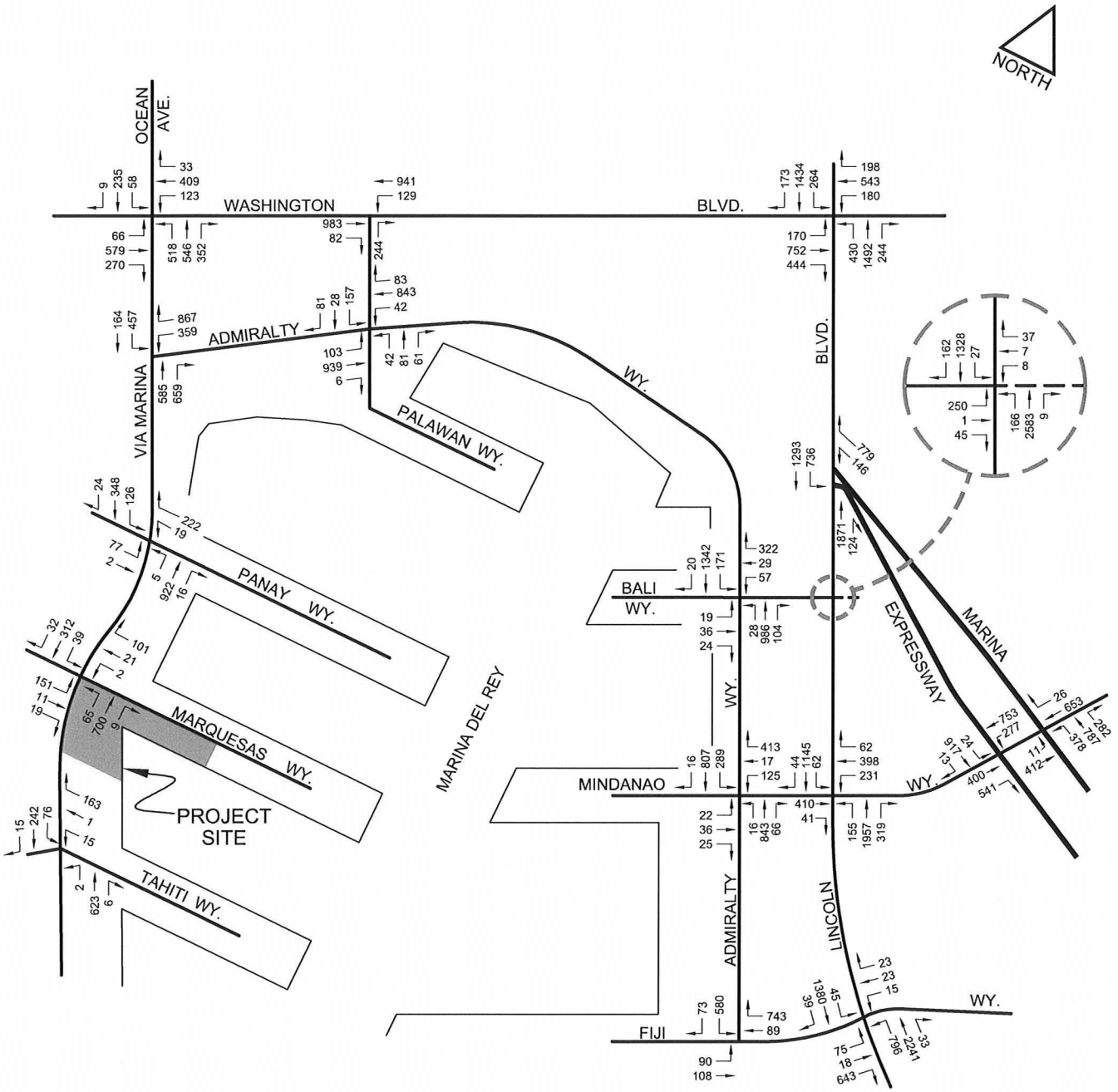

APPENDIX D-2(a)

12/3/2007

Marina del Rey Legacy\REPORT(12-2007)\AM2013WP(10R SLIPS

STICK-10R

FUTURE (2013) TRAFFIC VOLUMES
WITH AMBIENT GROWTH PLUS PROJ
(PARCEL 10R, BOAT SLIPS ONLY)
AM PEAK HOUR

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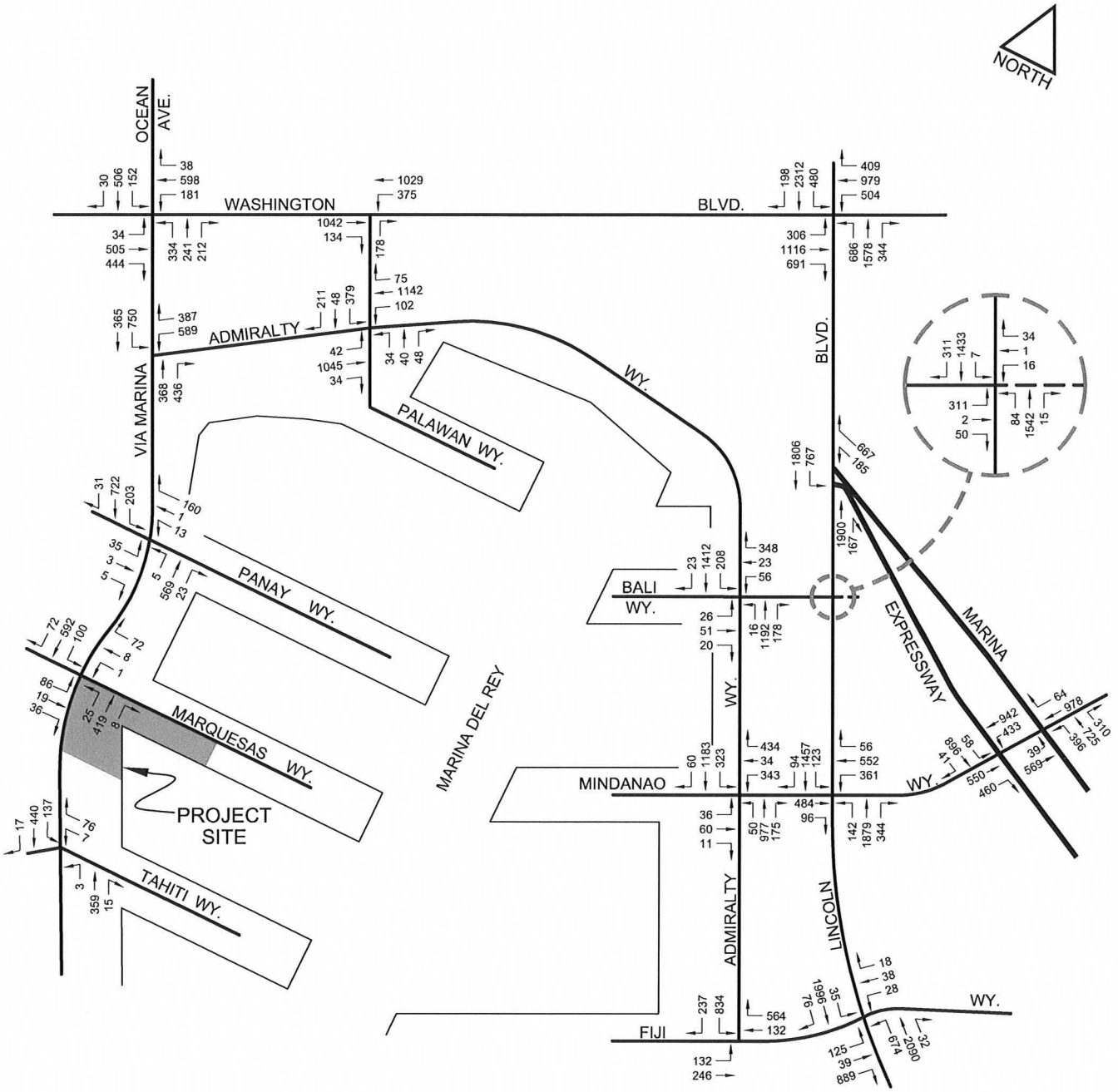


APPENDIX D-2(b)

12/3/2007

Marina del Rey Legacy\REPORT(12-2007)\PM2013WP(10R SLIPS)

FUTURE (2013) TRAFFIC VOLUMES
WITH AMBIENT GROWTH PLUS PROJ
(PARCEL 10R, BOAT SLIPS ONLY)
PM PEAK HOUR

STICK-10R

CRAIN & ASSOCIATES
Transportation Planning
Traffic Engineering
2007 Sawtelle Boulevard
Los Angeles California 90025
PH (310) 473 6508 F (310) 444 9771
www.crainandassociates.com

Table D-2
Critical Movement Analysis (CMA) Summary
Future (2013) Ambient Growth Traffic Conditions – Without and With Project
(Boat Slip Development of Parcels 10R and FF)

No.	Intersection	Peak Hour	With Ambient Growth CMA	With Ambient Growth LOS	With Ambient Growth Plus Project CMA	With Ambient Growth Plus Project LOS	Impact
1	Tahiti Way and	AM	0.276	A	0.276	A	0.000
	Via Marina	PM	0.179	A	0.179	A	0.000
2	Marquesas Way and	AM	0.271	A	0.270	A	-0.001
	Via Marina	PM	0.188	A	0.188	A	0.000
3	Panay Way and	AM	0.360	A	0.360	A	0.000
	Via Marina	PM	0.263	A	0.263	A	0.000
4	Admiralty Way and	AM	0.730	C	0.730	C	0.000
	Via Marina	PM	0.783	C	0.783	C	0.000
5	Washington Boulevard and	AM	0.744	C	0.744	C	0.000
	Via Marina/Ocean Avenue	PM	0.799	C	0.799	C	0.000
6	Admiralty Way and	AM	0.444	A	0.443	A	-0.001
	Palawan Way	PM	0.629	B	0.629	B	0.000
7	Washington Boulevard and	AM	0.668	B	0.668	B	0.000
	Palawan Way	PM	0.747	C	0.747	C	0.000
8	Washington Boulevard and	AM	0.807	D	0.807	D	0.000
	Lincoln Boulevard	PM	1.390	F	1.390	F	0.000
9	Lincoln Boulevard and	AM	0.707	C	0.707	C	0.000
	Marina Expressway (SR-90)	PM	0.751	C	0.751	C	0.000
10	Lincoln Boulevard and	AM	0.677	B	0.677	B	0.000
	Bali Way	PM	0.534	A	0.534	A	0.000
11	Lincoln Boulevard and	AM	0.754	C	0.754	C	0.000
	Mindanao Way	PM	0.884	D	0.884	D	0.000
12	Lincoln Boulevard and	AM	0.613	B	0.613	B	0.000
	Fiji Way	PM	0.762	C	0.762	C	0.000
13	Admiralty Way and	AM	0.480	A	0.479	A	-0.001
	Bali Way	PM	0.602	B	0.602	B	0.000
14	Admiralty Way and	AM	0.654	B	0.653	B	-0.001
	Mindanao Way	PM	0.772	C	0.772	C	0.000
15	Admiralty Way and	AM	0.266	A	0.266	A	0.000
	Fiji Way	PM	0.386	A	0.386	A	0.000
16	Marina Expressway (SR-90)	AM	0.423	A	0.423	A	0.000
	Westbound and Mindanao Way	PM	0.555	A	0.555	A	0.000
17	Marina Expressway (SR-90)	AM	0.641	B	0.641	B	0.000
	Eastbound and Mindanao Way	PM	0.769	C	0.769	C	0.000

However, all projects within the Marina, including the proposed project, are required to pay a traffic mitigation fee imposed by the County of Los Angeles pursuant to the Marina del Rey Specific Plan Transportation Improvement Program. This fee is intended to fund the Category 1 (local Marina) and Category 3 (regional) roadway improvements described in the TIP, by providing "fair share" contributions toward the improvements, based on the amount of project PM peak hour trips. (Category 2 roadway improvements are reserved for Area A, which is DZ 15 and is part of the Playa Vista Development on the Marina.) These improvements address local traffic generated in and confined to the Marina, as well as trips which leave or pass through the Marina (regional trips). The County's traffic mitigation fee structure is currently $5,690 per PM peak hour trip. However, based on the expected net project trip generation reduction of 1 PM peak hour trip, the project would not be required to pay a trip mitigation fee. This trip reduction can be transferred and used by other projects within the Marina to offset their fees, such as the residential project on Parcels 10R and FF.

It should be noted that the proposed boat slip development on Parcels 10R and FF does not change the analysis of future "With Cumulative Project" traffic conditions that was described in the body of the report, as all the individual components of the combined Parcels 10R, FF and 9U project are still proposed and remain the same. Thus, no further analysis of future cumulative project conditions is required.

In addition, since the proposed project would result in a net trip generation decrease of 1 net trip during both the AM and PM peak hours, the need for cumulative transportation mitigation measures would be caused by other projects in the area and those projects would be responsible for funding the proposed cumulative improvements described in the Mitigation Measures section of the report.

APPENDIX E

TRAFFIC ANALYSIS FOR PROPOSED PUBLIC PARK DEVELOPMENT ON PARCEL 9U

APPENDIX E

The proposed project that was described in the body of the report is composed of residential units, a hotel/timeshare resort, boat slips and a public park located on Parcels 10R, FF and 9U in Marina del Rey. For the purpose of this study, the analysis of individual components of the proposed Parcels 10R, FF and 9U project was also conducted. This appendix analyzes the public park development on Parcel 9U only, hereafter called the "proposed project" in this appendix. Specifically, the public park would be developed on the southern portion of Parcel 9U on approximately 1.46 acres, which is located on the northeast corner of Tahiti Way and Via Marina. Parcel 9U is currently vacant.

As noted previously, the proposed public park on Parcel 9U is anticipated to result in approximately 50 new daily trips, with the peak hour traffic for the park expected to be nominal, as summarized in Table E-1.

Table E-1
Project Trip Generation
(Public Park Development on Parcel 9U Only)

		AM Peak Hour			PM Peak Hour		
Size/Use	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Proposed Uses							
1.46 Ac Public Park	50	0	0	0	0	0	0
Existing Uses - Removed							
None	0	0	0	0	0	0	0
Net New Trips	***50***	***0***	***0***	***0***	***0***	***0***	***0***

Since the proposed public park is not anticipated to generate any AM and PM peak hour trips, no significant impacts to any study intersections is anticipated.

However, all projects within the Marina, including the proposed project, are required to pay a traffic mitigation fee imposed by the County of Los Angeles pursuant to the Marina del Rey Specific Plan Transportation Improvement Program. This fee is intended to fund the Category 1 (local Marina) and Category 3 (regional) roadway improvements described in the TIP, by providing "fair share" contributions toward the improvements, based on the amount of project PM peak hour trips. (Category 2 roadway improvements are reserved for Area A, which is DZ 15 and is part of the Playa Vista Development on the Marina.) These improvements address local traffic generated in and confined to the Marina, as well as trips which leave or pass through the Marina (regional trips). The County's traffic mitigation fee structure is currently $5,690 per PM peak hour trip. As noted previously, the proposed project is not anticipated to generate any PM peak hour trips. Thus, the proposed project would not be required to pay a trip mitigation fee.

It should be noted that the analysis of future "With Cumulative Project" traffic conditions that was described in the body of the report does not change, as all the individual components of the Parcels 10R, FF and 9U project are still proposed and remain the same. Thus, no further analysis of future cumulative project conditions is required.

In addition, since the proposed project would not add any AM or PM peak hour trips to the street system, the need for cumulative transportation mitigation measures would be caused by other projects in the area and those projects would be responsible for funding the proposed cumulative improvements described in the Mitigation Measures section of the report.

APPENDIX F

TRAFFIC COUNTS

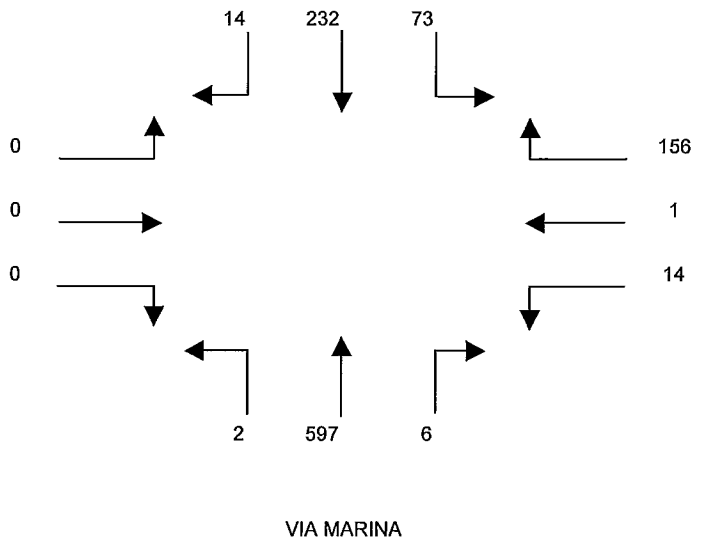
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: CRAIN & ASSOCIATES
PROJECT: MARINA DEL REY PROJECT
DATE: WEDNESDAY, MARCH 01, 2006
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION: N/S VIA MARINA
E/W TAHITI WAY
FILE NUMBER: 1-AM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
700-715	1	50	13	30	0	0	2	120	0	0	0	0
715-730	2	48	10	33	0	0	1	130	1	0	0	0
730-745	1	57	16	31	0	0	1	148	1	0	0	0
745-800	2	61	19	36	0	4	0	152	1	0	0	0
800-815	4	55	18	48	0	2	2	155	0	0	0	0
815-830	5	54	18	42	0	3	3	144	1	0	0	0
830-845	3	62	18	30	1	5	1	146	0	0	0	0
845-900	2	71	15	28	0	3	1	126	0	0	0	0

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
700-800	6	216	58	130	0	4	4	550	3	0	0	0	971
715-815	9	221	63	148	0	6	4	585	3	0	0	0	1039
730-830	12	227	71	157	0	9	6	599	3	0	0	0	1084
745-845	14	232	73	156	1	14	6	597	2	0	0	0	1095
800-900	14	242	69	148	1	13	7	571	1	0	0	0	1066

A.M. PEAK HOUR
745-845



TAHITI WAY

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

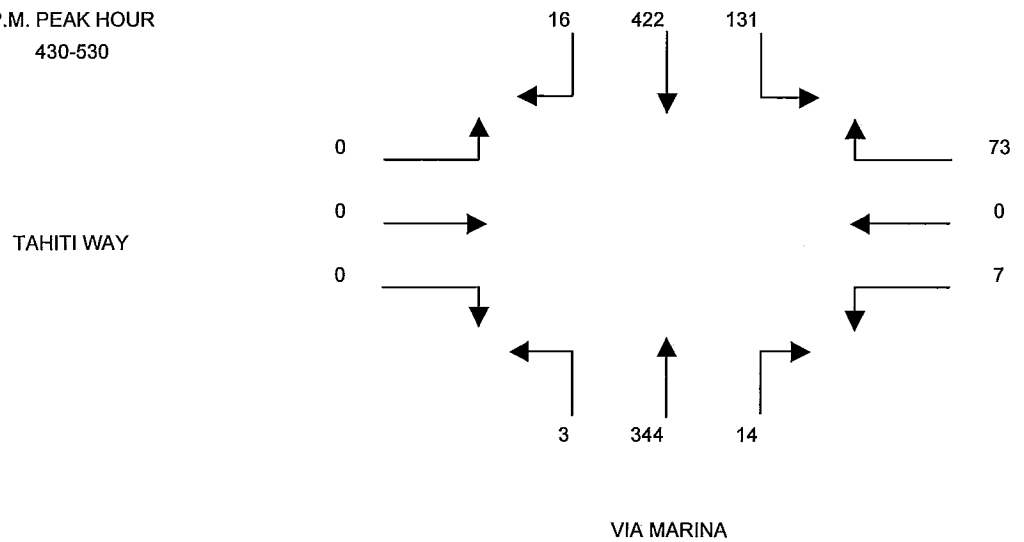
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: CRAIN & ASSOCIATES
PROJECT: MARINA DEL REY TMC PROJECT
DATE: WEDNESDAY, MARCH 01, 2006
PERIOD: 04:00 PM TO 06:00 PM
INTERSECTION: N/S VIA MARINA
E/W TAHITI WAY
FILE NUMBER: 1-PM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
400-415	2	93	20	23	0	1	5	84	1	0	0	0
415-430	4	109	20	20	0	2	5	70	3	0	0	0
430-445	4	116	33	21	0	1	4	80	2	0	0	0
445-500	6	80	31	15	0	3	4	94	1	0	0	0
500-515	3	114	32	22	0	1	4	79	0	0	0	0
515-530	3	112	35	15	0	2	2	91	0	0	0	0
530-545	7	106	25	24	0	1	3	88	0	0	0	0
545-600	6	99	32	20	0	1	1	76	0	0	0	0

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
400-500	16	398	104	79	0	7	18	328	7	0	0	0	957
415-515	17	419	116	78	0	7	17	323	6	0	0	0	983
430-530	16	422	131	73	0	7	14	344	3	0	0	0	1010
445-545	19	412	123	76	0	7	13	352	1	0	0	0	1003
500-600	19	431	124	81	0	5	10	334	0	0	0	0	1004

P.M. PEAK HOUR
430-530



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329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

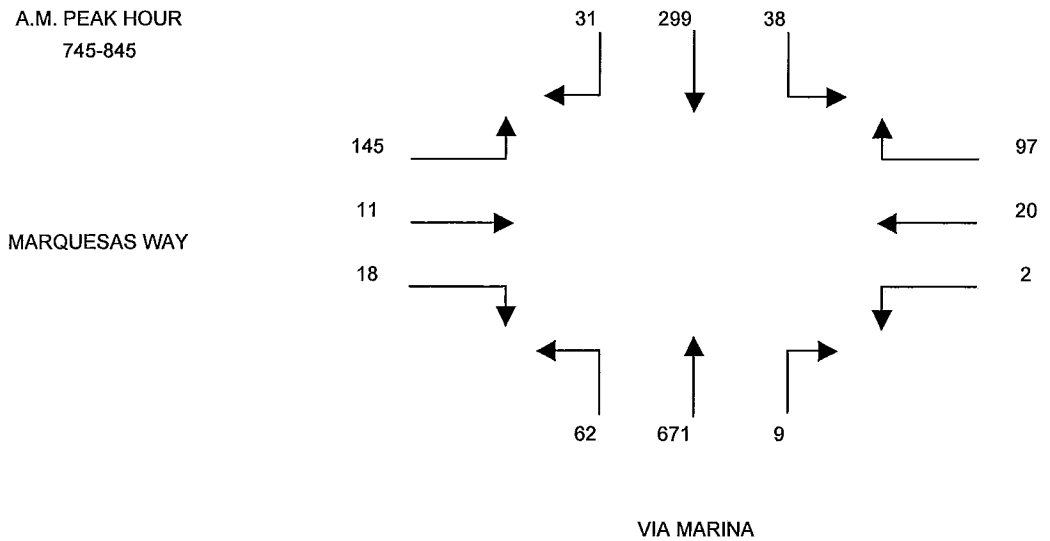
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: CRAIN & ASSOCIATES
PROJECT: MARINA DEL REY PROJECT
DATE: WEDNESDAY, MARCH 01, 2006
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION: N/S VIA MARINA
E/W MARQUESAS WAY
FILE NUMBER: 2-AM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
700-715	5	46	12	10	1	0	0	157	5	1	2	21
715-730	10	57	8	17	2	0	1	165	7	2	1	29
730-745	5	67	12	24	5	0	0	170	8	1	2	30
745-800	8	73	9	25	7	0	2	186	15	3	4	26
800-815	11	79	12	26	5	0	2	161	19	3	3	42
815-830	7	69	11	26	5	0	3	162	16	6	3	41
830-845	5	78	6	20	3	2	2	162	12	6	1	36
845-900	6	69	9	22	1	0	3	177	7	3	2	38

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
700-800	28	243	41	76	15	0	3	678	35	7	9	106	1241
715-815	34	276	41	92	19	0	5	682	49	9	10	127	1344
730-830	31	288	44	101	22	0	7	679	58	13	12	139	1394
745-845	31	299	38	97	20	2	9	671	62	18	11	145	1403
800-900	29	295	38	94	14	2	10	662	54	18	9	157	1382

A.M. PEAK HOUR
745-845



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ARCADIA, CALIFORNIA 91006
626.446.7978

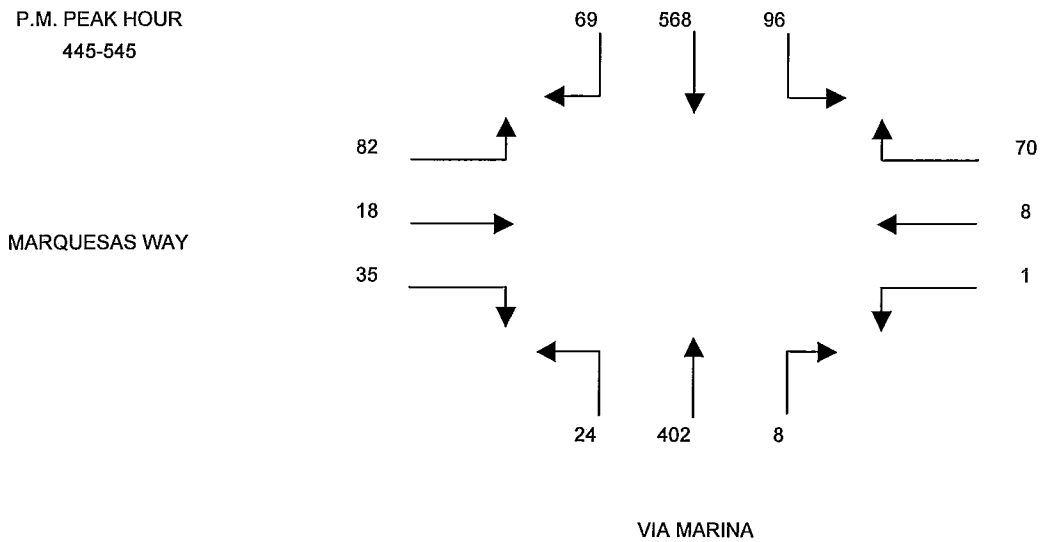
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: CRAIN & ASSOCIATES
PROJECT: MARINA DEL REY PROJECT
DATE: WEDNESDAY, MARCH 01, 2006
PERIOD: 04:00 PM TO 06:00 PM
INTERSECTION: N/S VIA MARINA
E/W MARQUESAS WAY
FILE NUMBER: 2-PM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
400-415	13	109	16	14	3	0	4	59	2	5	4	23
415-430	19	121	23	19	2	0	3	90	3	10	8	30
430-445	15	101	18	19	2	0	4	94	6	6	5	29
445-500	15	120	23	14	2	0	1	98	4	4	3	24
500-515	21	151	23	17	1	0	3	111	5	6	4	19
515-530	15	141	24	24	3	1	2	97	8	10	5	24
530-545	18	156	26	15	2	0	2	96	7	15	6	15
545-600	14	125	23	10	3	0	1	85	12	11	4	11

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
400-500	62	451	80	66	9	0	12	341	15	25	20	106	1187
415-515	70	493	87	69	7	0	11	393	18	26	20	102	1296
430-530	66	513	88	74	8	1	10	400	23	26	17	96	1322
445-545	69	568	96	70	8	1	8	402	24	35	18	82	1381
500-600	68	573	96	66	9	1	8	389	32	42	19	69	1372

P.M. PEAK HOUR
445-545



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ARCADIA, CALIFORNIA 91006
626.446.7978

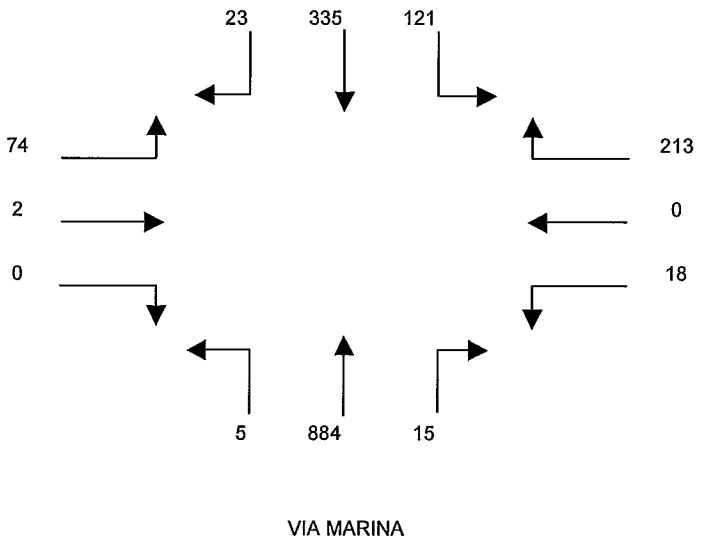
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: CRAIN & ASSOCIATES
PROJECT: MARINA DEL REY PROJECT
DATE: WEDNESDAY, MARCH 01, 2006
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION: N/S VIA MARINA
E/W PANAY WAY
FILE NUMBER: 3-AM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
700-715	7	67	16	44	2	2	4	201	2	2	1	10
715-730	6	85	27	42	0	0	2	215	1	1	2	15
730-745	7	80	22	32	0	0	3	209	0	0	0	11
745-800	2	99	35	51	0	3	7	236	0	0	0	19
800-815	6	82	29	45	0	3	3	227	1	0	2	15
815-830	8	83	24	58	0	5	2	218	3	0	0	23
830-845	7	71	33	59	0	7	3	203	1	0	0	17
845-900	10	86	25	47	0	4	1	202	1	3	1	15

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
700-800	22	331	100	169	2	5	16	861	3	3	3	55	1570
715-815	21	346	113	170	0	6	15	887	2	1	4	60	1625
730-830	23	344	110	186	0	11	15	890	4	0	2	68	1653
745-845	23	335	121	213	0	18	15	884	5	0	2	74	1690
800-900	31	322	111	209	0	19	9	850	6	3	3	70	1633

A.M. PEAK HOUR
745-845



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ARCADIA, CALIFORNIA 91006
626.446.7978

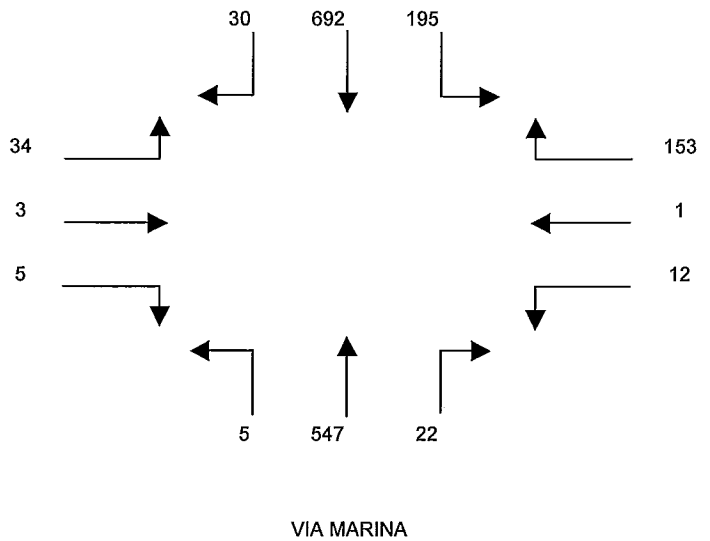
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: CRAIN & ASSOCIATES
PROJECT: MARINA DEL REY PROJECT
DATE: WEDNESDAY, MARCH 01, 2006
PERIOD: 04:00 PM TO 06:00 PM
INTERSECTION: N/S VIA MARINA
E/W PANAY WAY
FILE NUMBER: 3-PM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
400-415	7	142	33	36	0	2	5	133	2	0	0	11
415-430	8	156	36	50	0	1	4	125	1	1	0	10
430-445	10	152	50	51	0	2	8	123	0	0	0	10
445-500	8	173	48	34	0	2	5	120	1	1	1	7
500-515	7	173	41	48	0	3	7	159	0	1	0	10
515-530	6	186	47	28	1	4	5	143	2	3	0	8
530-545	9	160	59	43	0	3	5	125	2	0	2	9
545-600	8	173	47	37	1	3	6	97	0	1	0	7

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
400-500	33	623	167	171	0	7	22	501	4	2	1	38	1569
415-515	33	654	175	183	0	8	24	527	2	3	1	37	1647
430-530	31	684	186	161	1	11	25	545	3	5	1	35	1688
445-545	30	692	195	153	1	12	22	547	5	5	3	34	1699
500-600	30	692	194	156	2	13	23	524	4	5	2	34	1679

P.M. PEAK HOUR
445-545



PANAY WAY

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

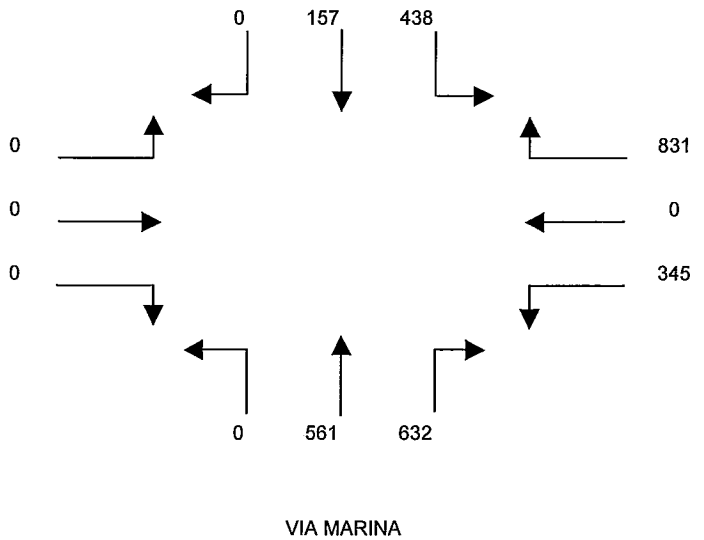
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: CRAIN & ASSOCIATES
PROJECT: MARINA DEL REY PROJECT
DATE: WEDNESDAY, MARCH 01, 2006
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION: N/S VIA MARINA
E/W ADMIRALTY WAY
FILE NUMBER: 4-AM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
700-715	0	20	83	169	0	57	124	105	0	0	0	0
715-730	0	27	87	159	0	57	147	118	0	0	0	0
730-745	0	41	91	177	0	60	141	102	0	0	0	0
745-800	0	39	109	208	0	91	166	132	0	0	0	0
800-815	0	43	110	211	0	90	166	139	0	0	0	0
815-830	0	40	115	216	0	80	145	152	0	0	0	0
830-845	0	35	104	196	0	84	155	138	0	0	0	0
845-900	0	30	98	158	0	75	144	126	0	0	0	0

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
700-800	0	127	370	713	0	265	578	457	0	0	0	0	2510
715-815	0	150	397	755	0	298	620	491	0	0	0	0	2711
730-830	0	163	425	812	0	321	618	525	0	0	0	0	2864
745-845	0	157	438	831	0	345	632	561	0	0	0	0	2964
800-900	0	148	427	781	0	329	610	555	0	0	0	0	2850

A.M. PEAK HOUR
745-845



THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

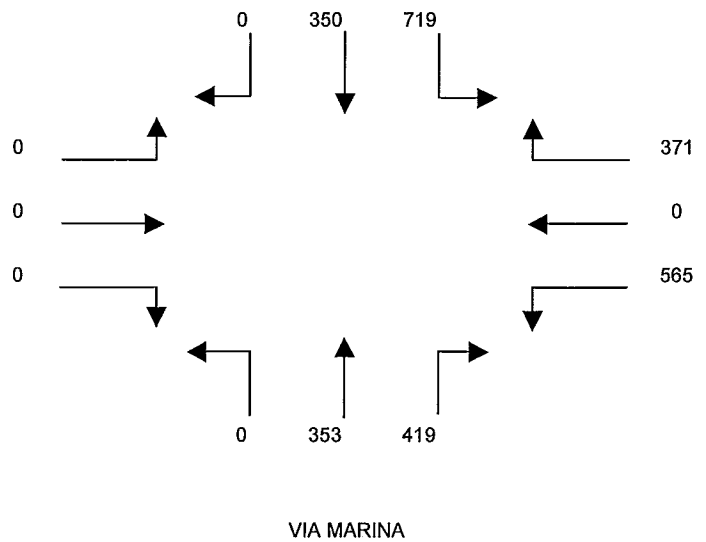
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: CRAIN & ASSOCIATES
PROJECT: MARINA DEL REY PROJECT
DATE: WEDNESDAY, MARCH 01, 2006
PERIOD: 04:00 PM TO 06:00 PM
INTERSECTION: N/S VIA MARINA
E/W ADMIRALTY WAY
FILE NUMBER: 4-PM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
400-415	0	68	127	55	0	123	110	81	0	0	0	0
415-430	0	92	187	99	0	118	107	66	0	0	0	0
430-445	0	109	197	87	0	133	108	87	0	0	0	0
445-500	0	85	175	95	0	138	92	77	0	0	0	0
500-515	0	71	168	106	0	142	110	91	0	0	0	0
515-530	0	85	179	83	0	152	109	98	0	0	0	0
530-545	0	101	182	95	0	143	90	78	0	0	0	0
545-600	0	99	161	105	0	131	89	72	0	0	0	0

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
400-500	0	354	686	336	0	512	417	311	0	0	0	0	2616
415-515	0	357	727	387	0	531	417	321	0	0	0	0	2740
430-530	0	350	719	371	0	565	419	353	0	0	0	0	2777
445-545	0	342	704	379	0	575	401	344	0	0	0	0	2745
500-600	0	356	690	389	0	568	398	339	0	0	0	0	2740

P.M. PEAK HOUR
430-530



THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

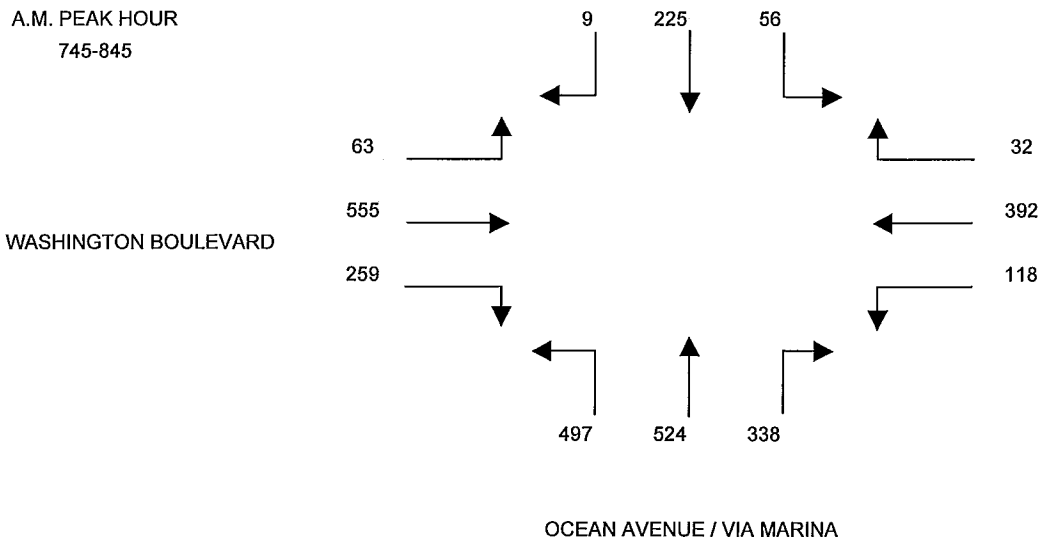
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: CRAIN & ASSOCIATES
PROJECT: MARINA DEL REY PROJECT
DATE: WEDNESDAY, MARCH 01, 2006
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION: N/S OCEAN AVENUE / VIA MARINA
E/W WASHINGTON BOULEVARD
FILE NUMBER: 5-AM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
700-715	1	37	7	5	65	24	86	82	90	32	102	7
715-730	3	46	10	8	69	19	75	107	103	43	121	9
730-745	2	47	7	10	73	22	70	117	116	46	147	15
745-800	2	69	9	7	99	25	74	122	128	65	139	20
800-815	4	52	13	7	101	31	90	124	119	70	153	19
815-830	2	54	19	9	96	32	80	130	121	57	148	14
830-845	1	50	15	9	96	30	94	148	111	67	115	10
845-900	3	45	14	11	89	33	79	125	96	68	140	7

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
700-800	8	199	33	30	306	90	305	428	437	186	509	51	2582
715-815	11	214	39	32	342	97	309	470	466	224	560	63	2827
730-830	10	222	48	33	369	110	314	493	484	238	587	68	2976
745-845	9	225	56	32	392	118	338	524	479	259	555	63	3050
800-900	10	201	61	36	382	126	343	527	447	262	556	50	3001

A.M. PEAK HOUR
745-845



THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

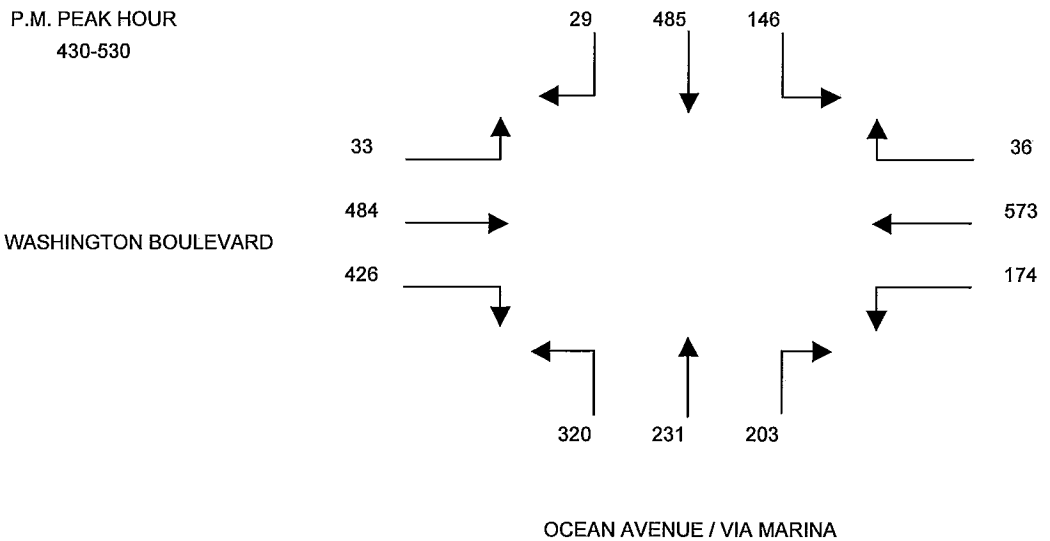
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: CRAIN & ASSOCIATES
PROJECT: MARINA DEL REY PROJECT
DATE: WEDNESDAY, MARCH 01, 2006
PERIOD: 04:00 PM TO 06:00 PM
INTERSECTION: N/S OCEAN AVENUE / VIA MARINA
E/W WASHINGTON BOULEVARD
FILE NUMBER: 5-PM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
400-415	6	104	27	9	115	34	50	58	68	94	111	11
415-430	6	123	27	6	124	47	45	50	68	105	135	15
430-445	8	116	36	10	144	54	45	62	84	113	131	11
445-500	10	123	42	6	132	41	57	64	77	107	114	7
500-515	6	118	35	9	150	35	48	54	83	100	119	5
515-530	5	128	33	11	147	44	53	51	76	106	120	10
530-545	9	123	34	12	133	37	31	77	63	85	132	11
545-600	9	114	31	10	132	41	36	57	71	111	133	10

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
400-500	30	466	132	31	515	176	197	234	297	419	491	44	3032
415-515	30	480	140	31	550	177	195	230	312	425	499	38	3107
430-530	29	485	146	36	573	174	203	231	320	426	484	33	3140
445-545	30	492	144	38	562	157	189	246	299	398	485	33	3073
500-600	29	483	133	42	562	157	168	239	293	402	504	36	3048

P.M. PEAK HOUR
430-530



THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

Crain & Associates
2007 Sawtelle Blvd., Suite 4
Los Angeles, CA 90025
Tel: (310) 473-6508

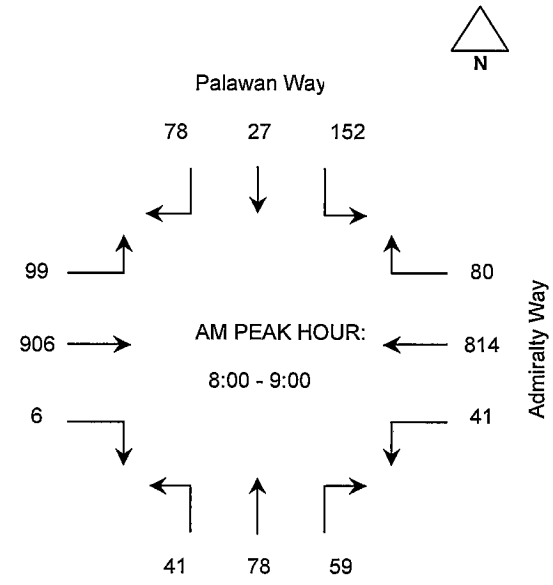
VEHICLE TURNING MOVEMENT COUNT SUMMARY

N/S STREET: Palawan Way **E/W STREET:** Admiralty Way

PERIOD: AM Peak Hour **DATE:** Wednesday January 31, 2007

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 7:15	7	155	7	10	113	2	7	6	3	22	4	6	342
7:15 - 7:30	7	174	12	9	131	1	6	14	8	24	7	11	404
7:30 - 7:45	8	238	20	8	199	2	8	8	21	35	4	9	560
7:45 - 8:00	10	200	23	12	209	1	7	13	17	40	5	11	548
8:00 - 8:15	8	200	22	25	232	0	9	17	14	42	9	17	595
8:15 - 8:30	10	197	20	27	225	2	10	19	17	39	7	20	593
8:30 - 8:45	14	226	21	26	229	3	13	20	15	36	3	19	625
8:45 - 9:00	9	191	17	21	220	1	9	22	13	35	8	22	568
9:00 - 9:15	7	170	15	14	212	2	6	19	12	37	9	25	528
9:15 - 9:30	7	162	13	13	199	3	10	17	10	31	7	20	492
9:30 - 9:45	9	149	21	16	211	4	7	11	7	32	10	21	498
9:45 - 10:00	10	151	16	17	174	5	15	4	8	25	11	20	456

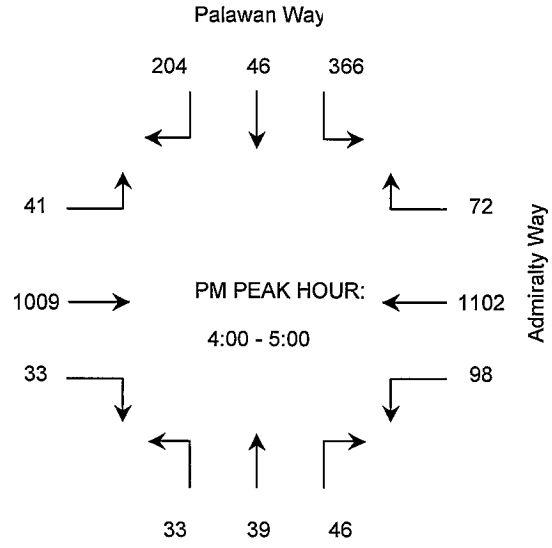
1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 8:00	32	767	62	39	652	6	28	41	49	121	20	37	1,854
7:15 - 8:15	33	812	77	54	771	4	30	52	60	141	25	48	2,107
7:30 - 8:30	36	835	85	72	865	5	34	57	69	156	25	57	2,296
7:45 - 8:45	42	823	86	90	895	6	39	69	63	157	24	67	2,361
8:00 - 9:00	41	814	80	99	906	6	41	78	59	152	27	78	2,381 *
8:15 - 9:15	40	784	73	88	886	8	38	80	57	147	27	86	2,314
8:30 - 9:30	37	749	66	74	860	9	38	78	50	139	27	86	2,213
8:45 - 9:45	32	672	66	64	842	10	32	69	42	135	34	88	2,086
9:00 - 10:00	33	632	65	60	796	14	38	51	37	125	37	86	1,974



PERIOD: PM Peak Hour **DATE:** Wednesday January 31, 2007

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 3:15	17	227	26	8	256	4	8	13	14	63	11	38	685
3:15 - 3:30	14	244	17	11	233	10	10	8	8	91	18	30	694
3:30 - 3:45	25	292	17	7	238	3	10	9	17	78	16	31	743
3:45 - 4:00	30	281	20	6	222	10	11	11	14	76	18	36	735
4:00 - 4:15	31	280	19	11	262	12	9	12	10	84	15	51	796
4:15 - 4:30	22	304	24	12	244	8	12	11	14	90	12	57	810
4:30 - 4:45	21	261	17	8	239	7	7	7	9	101	11	49	737
4:45 - 5:00	24	257	12	10	264	6	5	9	13	91	8	47	746
5:00 - 5:15	18	266	10	14	228	7	6	6	12	90	14	44	715
5:15 - 5:30	23	262	8	6	269	4	6	12	6	89	15	55	755
5:30 - 5:45	29	249	12	14	249	7	6	9	11	62	12	45	705
5:45 - 6:00	31	241	9	9	221	8	7	10	10	60	15	41	662

1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 4:00	86	1,044	80	32	949	27	39	41	53	308	63	135	2,857
3:15 - 4:15	100	1,097	73	35	955	35	40	40	49	329	67	148	2,968
3:30 - 4:30	108	1,157	80	36	966	33	42	43	55	328	61	175	3,084
3:45 - 4:45	104	1,126	80	37	967	37	39	41	47	351	56	193	3,078
4:00 - 5:00	98	1,102	72	41	1,009	33	33	39	46	366	46	204	3,089 *
4:15 - 5:15	85	1,088	63	44	975	28	30	33	48	372	45	197	3,008
4:30 - 5:30	86	1,046	47	38	1,000	24	24	34	40	371	48	195	2,953
4:45 - 5:45	94	1,034	42	44	1,010	24	23	36	42	332	49	191	2,921
5:00 - 6:00	101	1,018	39	43	967	26	25	37	39	301	56	185	2,837



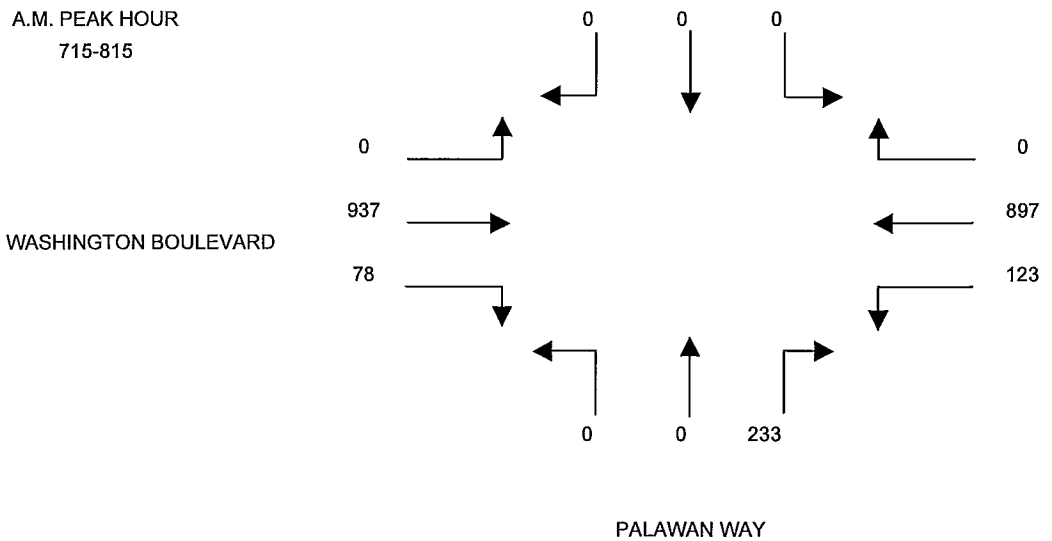
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: CRAIN & ASSOCIATES
PROJECT: MARINA DEL REY PROJECT
DATE: WEDNESDAY, OCTOBER 19, 2005
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION: N/S PALAWAN WAY
E/W WASHINGTON BOULEVARD
FILE NUMBER: 1-AM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
700-715	0	0	0	0	185	36	42	0	0	18	202	0
715-730	0	0	0	0	225	22	66	0	0	16	224	0
730-745	0	0	0	0	237	36	68	0	0	23	239	0
745-800	0	0	0	0	216	33	48	0	0	16	235	0
800-815	0	0	0	0	219	32	51	0	0	23	239	0
815-830	0	0	0	0	206	35	59	0	0	19	232	0
830-845	0	0	0	0	199	38	51	0	0	17	222	0
845-900	0	0	0	0	180	23	47	0	0	12	218	0

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
700-800	0	0	0	0	863	127	224	0	0	73	900	0	2187
715-815	0	0	0	0	897	123	233	0	0	78	937	0	2268
730-830	0	0	0	0	878	136	226	0	0	81	945	0	2266
745-845	0	0	0	0	840	138	209	0	0	75	928	0	2190
800-900	0	0	0	0	804	128	208	0	0	71	911	0	2122

A.M. PEAK HOUR
715-815



THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

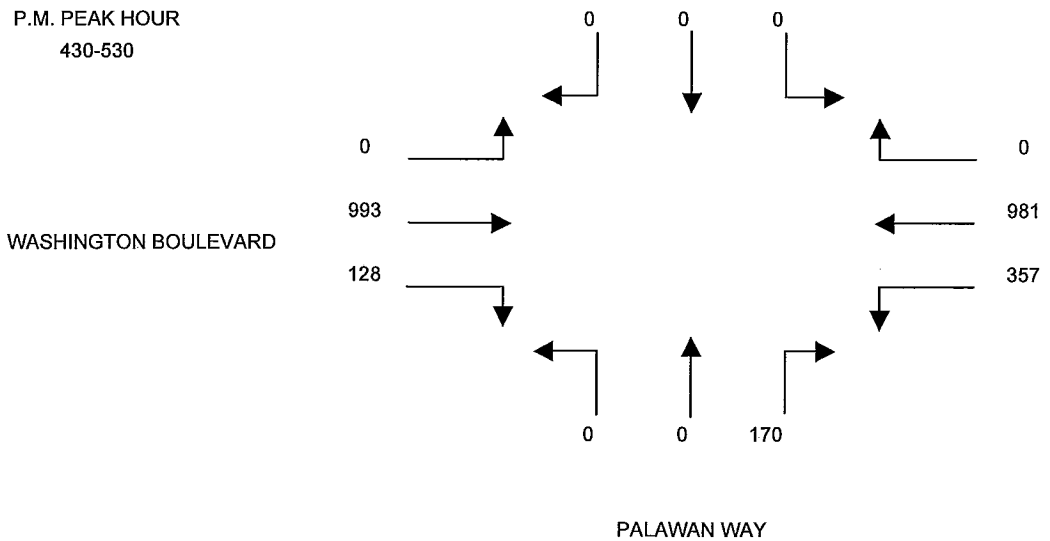
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: CRAIN & ASSOCIATES
PROJECT: MARINA DEL REY PROJECT
DATE: WEDNESDAY, OCTOBER 19, 2005
PERIOD: 04:00 PM TO 06:00 PM
INTERSECTION: N/S PALAWAN WAY
E/W WASHINGTON BOULEVARD
FILE NUMBER: 1-PM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
400-415	0	0	0	0	219	77	47	0	0	29	226	0
415-430	0	0	0	0	222	61	32	0	0	36	253	0
430-445	0	0	0	0	239	95	45	0	0	29	251	0
445-500	0	0	0	0	244	87	42	0	0	20	259	0
500-515	0	0	0	0	251	88	48	0	0	41	244	0
515-530	0	0	0	0	247	87	35	0	0	38	239	0
530-545	0	0	0	0	232	79	43	0	0	49	231	0
545-600	0	0	0	0	219	71	34	0	0	41	227	0

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
400-500	0	0	0	0	924	320	166	0	0	114	989	0	2513
415-515	0	0	0	0	956	331	167	0	0	126	1007	0	2587
430-530	0	0	0	0	981	357	170	0	0	128	993	0	2629
445-545	0	0	0	0	974	341	168	0	0	148	973	0	2604
500-600	0	0	0	0	949	325	160	0	0	169	941	0	2544

P.M. PEAK HOUR
430-530



THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

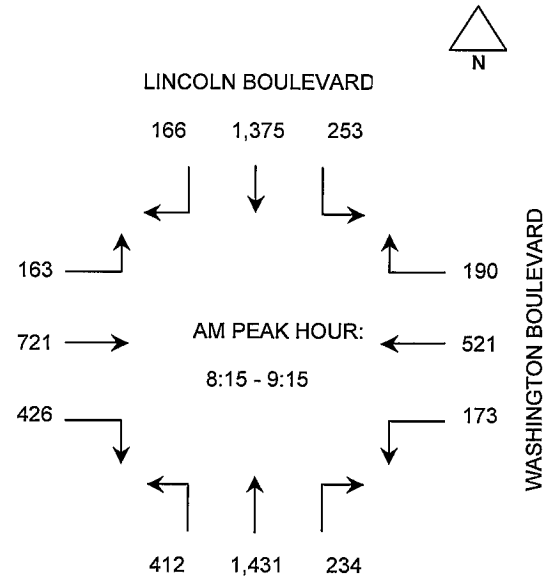
Crain & Associates
2007 Sawtelle Blvd., Suite 4
Los Angeles, CA 90025
Tel: (310) 473-6508

VEHICLE TURNING MOVEMENT COUNT SUMMARY

N/S STREET: LINCOLN BOULEVARD **E/W STREET:** WASHINGTON BOULEVARD
PERIOD: AM PEAK HOUR **DATE:** TUESDAY JUNE 6, 2006

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 7:15	14	87	36	37	121	91	91	406	34	34	234	18	1,203
7:15 - 7:30	15	75	45	36	141	113	90	460	39	30	233	27	1,304
7:30 - 7:45	33	177	65	38	197	133	115	527	49	45	337	34	1,750
7:45 - 8:00	27	116	39	28	150	76	92	353	37	29	244	26	1,217
8:00 - 8:15	31	147	55	21	177	117	117	430	44	42	289	38	1,508
8:15 - 8:30	39	130	52	42	213	107	102	352	57	71	381	38	1,584
8:30 - 8:45	36	132	47	40	107	102	121	353	53	48	322	41	1,402
8:45 - 9:00	54	115	46	43	187	106	94	366	71	70	350	45	1,547
9:00 - 9:15	44	144	45	38	214	111	95	360	53	64	322	42	1,532
9:15 - 9:30	54	117	56	55	210	120	108	350	62	84	269	20	1,505
9:30 - 9:45	54	120	58	39	141	97	111	347	54	61	236	36	1,354
9:45 - 10:00	34	124	68	40	147	96	84	330	46	59	263	47	1,338

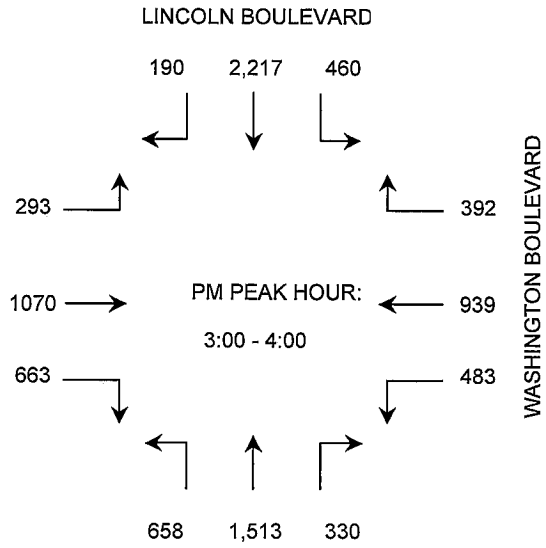
1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 8:00	89	455	185	139	609	413	388	1,746	159	138	1,048	105	5,474
7:15 - 8:15	106	515	204	123	665	439	414	1,770	169	146	1,103	125	5,779
7:30 - 8:30	130	570	211	129	737	433	426	1,662	187	187	1,251	136	6,059
7:45 - 8:45	133	525	193	131	647	402	432	1,488	191	190	1,236	143	5,711
8:00 - 9:00	160	524	200	146	684	432	434	1,501	225	231	1,342	162	6,041
8:15 - 9:15	173	521	190	163	721	426	412	1,431	234	253	1,375	166	6,065 *
8:30 - 9:30	188	508	194	176	718	439	418	1,429	239	266	1,263	148	5,986
8:45 - 9:45	206	496	205	175	752	434	408	1,423	240	279	1,177	143	5,938
9:00 - 10:00	186	505	227	172	712	424	398	1,387	215	268	1,090	145	5,729



PERIOD: PM PEAK HOUR **DATE:** TUESDAY JUNE 6, 2006

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 3:15	136	238	101	79	261	171	192	408	89	140	428	50	2,293
3:15 - 3:30	130	235	105	77	276	162	184	411	83	134	441	44	2,282
3:30 - 3:45	152	287	115	87	345	206	195	492	104	136	600	65	2,784
3:45 - 4:00	65	179	71	50	188	124	87	202	54	50	748	31	1,849
4:00 - 4:15	84	186	65	43	191	118	122	370	91	46	743	26	2,085
4:15 - 4:30	83	183	63	40	173	123	83	259	70	65	325	25	1,492
4:30 - 4:45	70	176	84	30	157	110	92	210	54	86	336	34	1,439
4:45 - 5:00	50	161	59	35	176	117	110	322	58	80	355	35	1,558
5:00 - 5:15	62	183	64	39	176	121	118	338	62	73	394	46	1,676
5:15 - 5:30	70	198	70	40	173	129	119	358	66	64	421	57	1,765
5:30 - 5:45	63	167	73	31	193	128	98	298	64	84	329	50	1,578
5:45 - 6:00	49	205	66	37	189	128	115	333	62	72	358	49	1,663

1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 4:00	483	939	392	293	1,070	663	658	1,513	330	460	2,217	190	9,208 *
3:15 - 4:15	431	887	356	257	1,000	610	588	1,475	332	366	2,532	166	9,000
3:30 - 4:30	384	835	314	220	897	571	487	1,323	319	297	2,416	147	8,210
3:45 - 4:45	302	724	283	163	709	475	384	1,041	269	247	2,152	116	6,865
4:00 - 5:00	287	706	271	148	697	468	407	1,161	273	277	1,759	120	6,574
4:15 - 5:15	265	703	270	144	682	471	403	1,129	244	304	1,410	140	6,165
4:30 - 5:30	252	718	277	144	682	477	439	1,228	240	303	1,506	172	6,438
4:45 - 5:45	245	709	266	145	718	495	445	1,316	250	301	1,499	188	6,577
5:00 - 6:00	244	753	273	147	731	506	450	1,327	254	293	1,502	202	6,682



Crain & Associates
2007 Sawtelle Blvd., Suite 4
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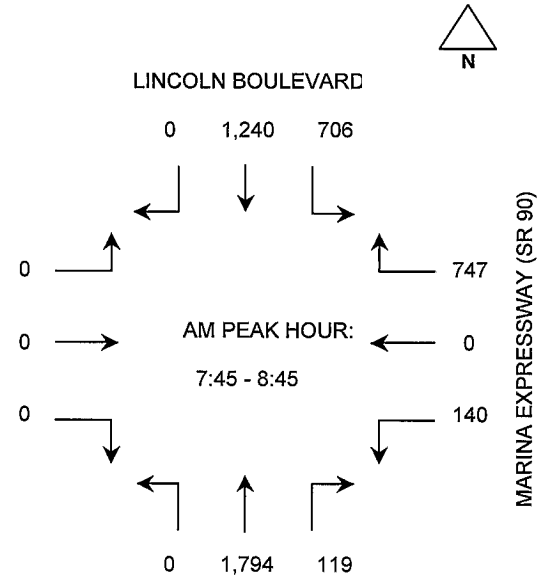
Tel: (310) 473-6508

VEHICLE TURNING MOVEMENT COUNT SUMMARY

N/S STREET: LINCOLN BOULEVARD **E/W STREET:** MARINA EXPRESSWAY (SR 90)
PERIOD: AM PEAK HOUR **DATE:** TUESDAY JUNE 13, 2006

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 7:15	23	0	156	0	0	0	0	438	18	96	147	0	878
7:15 - 7:30	19	0	138	0	0	0	0	495	13	148	217	0	1,030
7:30 - 7:45	32	0	168	0	0	0	0	493	21	167	294	0	1,175
7:45 - 8:00	32	0	192	0	0	0	0	493	24	166	275	0	1,182
8:00 - 8:15	42	0	190	0	0	0	0	425	21	178	321	0	1,177
8:15 - 8:30	22	0	174	0	0	0	0	461	34	180	308	0	1,179
8:30 - 8:45	44	0	191	0	0	0	0	415	40	182	336	0	1,208
8:45 - 9:00	39	0	165	0	0	0	0	417	24	151	334	0	1,130
9:00 - 9:15	26	0	151	0	0	0	0	420	26	166	304	0	1,093
9:15 - 9:30	26	0	140	0	0	0	0	407	34	143	324	0	1,074
9:30 - 9:45	45	0	149	0	0	0	0	408	32	127	319	0	1,080
9:45 - 10:00	41	0	157	0	0	0	0	368	34	114	300	0	1,014

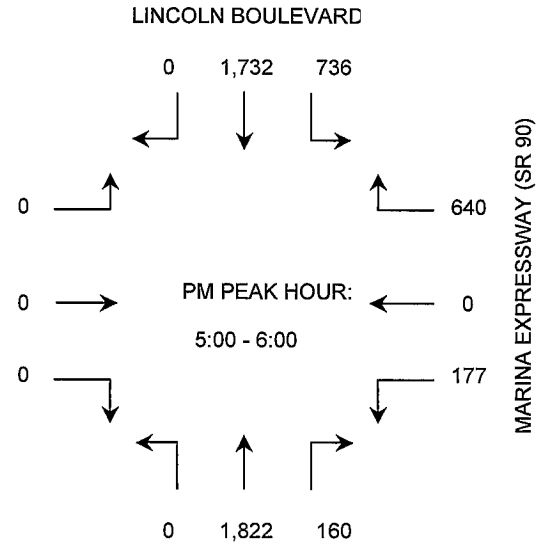
1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 8:00	106	0	654	0	0	0	0	1,919	76	577	933	0	4,265
7:15 - 8:15	125	0	688	0	0	0	0	1,906	79	659	1,107	0	4,564
7:30 - 8:30	128	0	724	0	0	0	0	1,872	100	691	1,198	0	4,713
7:45 - 8:45	140	0	747	0	0	0	0	1,794	119	706	1,240	0	4,746 *
8:00 - 9:00	147	0	720	0	0	0	0	1,718	119	691	1,299	0	4,694
8:15 - 9:15	131	0	681	0	0	0	0	1,713	124	679	1,282	0	4,610
8:30 - 9:30	135	0	647	0	0	0	0	1,659	124	642	1,298	0	4,505
8:45 - 9:45	136	0	605	0	0	0	0	1,652	116	587	1,281	0	4,377
9:00 - 10:00	138	0	597	0	0	0	0	1,603	126	550	1,247	0	4,261



PERIOD: PM PEAK HOUR **DATE:** TUESDAY JUNE 13, 2006

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 3:15	32	0	142	0	0	0	0	393	35	162	401	0	1,165
3:15 - 3:30	38	0	132	0	0	0	0	384	50	157	371	0	1,132
3:30 - 3:45	35	0	118	0	0	0	0	404	62	175	410	0	1,204
3:45 - 4:00	41	0	159	0	0	0	0	400	64	155	379	0	1,198
4:00 - 4:15	41	0	113	0	0	0	0	425	59	198	434	0	1,270
4:15 - 4:30	40	0	134	0	0	0	0	385	37	166	344	0	1,106
4:30 - 4:45	39	0	153	0	0	0	0	391	56	146	390	0	1,175
4:45 - 5:00	36	0	153	0	0	0	0	429	38	196	409	0	1,261
5:00 - 5:15	48	0	153	0	0	0	0	447	30	176	453	0	1,307
5:15 - 5:30	39	0	160	0	0	0	0	450	50	197	443	0	1,339
5:30 - 5:45	50	0	174	0	0	0	0	429	40	181	427	0	1,301
5:45 - 6:00	40	0	153	0	0	0	0	496	40	182	409	0	1,320

1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 4:00	146	0	551	0	0	0	0	1,581	211	649	1,561	0	4,699
3:15 - 4:15	155	0	522	0	0	0	0	1,613	235	685	1,594	0	4,804
3:30 - 4:30	157	0	524	0	0	0	0	1,614	222	694	1,567	0	4,778
3:45 - 4:45	161	0	559	0	0	0	0	1,601	216	665	1,547	0	4,749
4:00 - 5:00	156	0	553	0	0	0	0	1,630	190	706	1,577	0	4,812
4:15 - 5:15	163	0	593	0	0	0	0	1,652	161	684	1,596	0	4,849
4:30 - 5:30	162	0	619	0	0	0	0	1,717	174	715	1,695	0	5,082
4:45 - 5:45	173	0	640	0	0	0	0	1,755	158	750	1,732	0	5,208
5:00 - 6:00	177	0	640	0	0	0	0	1,822	160	736	1,732	0	5,267 *



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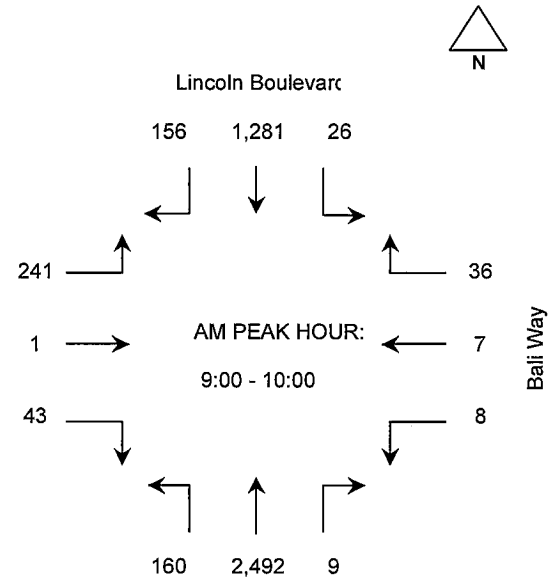
VEHICLE TURNING MOVEMENT COUNT SUMMARY

N/S STREET: Lincoln Boulevard **E/W STREET:** Bali Way
PERIOD: AM Peak Hour **DATE:** Wednesday January 31, 2007

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 7:15	1	0	0	24	0	3	17	464	7	3	227	38	784
7:15 - 7:30	0	0	5	24	2	7	19	368	3	3	225	27	683
7:30 - 7:45	0	1	0	26	3	6	17	409	5	1	252	31	751
7:45 - 8:00	0	0	0	18	0	9	16	444	5	0	286	34	812
8:00 - 8:15	0	0	3	46	0	4	26	378	6	1	295	30	789
8:15 - 8:30	1	0	1	44	1	7	24	386	5	3	316	29	817
8:30 - 8:45	0	1	2	45	0	4	25	411	7	5	337	33	870
8:45 - 9:00	2	0	0	43	1	9	29	422	7	6	342	34	895
9:00 - 9:15	1	2	8	38	1	10	52	592	3	5	329	38	1,079
9:15 - 9:30	5	2	9	47	0	9	74	675	1	5	336	33	1,196
9:30 - 9:45	0	0	12	70	0	13	18	617	3	8	303	40	1,084
9:45 - 10:00	2	3	7	86	0	11	16	608	2	8	313	45	1,101

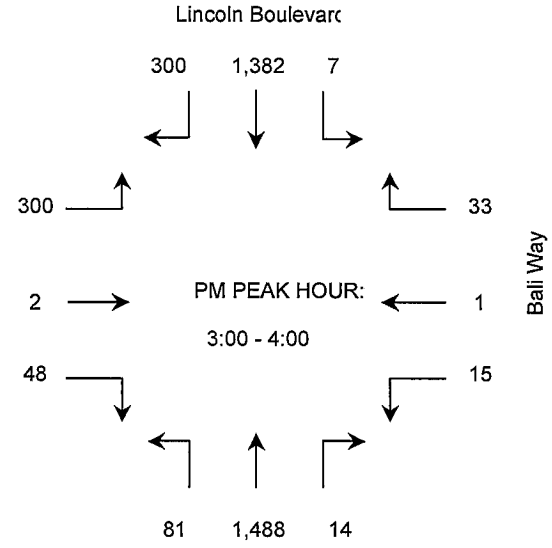
1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 8:00	1	1	5	92	5	25	69	1,685	20	7	990	130	3,030
7:15 - 8:15	0	1	8	114	5	26	78	1,599	19	5	1,058	122	3,035
7:30 - 8:30	1	1	4	134	4	26	83	1,617	21	5	1,149	124	3,169
7:45 - 8:45	1	1	6	153	1	24	91	1,619	23	9	1,234	126	3,288
8:00 - 9:00	3	1	6	178	2	24	104	1,597	25	15	1,290	126	3,371
8:15 - 9:15	4	3	11	170	3	30	130	1,811	22	19	1,324	134	3,661
8:30 - 9:30	8	5	19	173	2	32	180	2,100	18	21	1,344	138	4,040
8:45 - 9:45	8	4	29	198	2	41	173	2,306	14	24	1,310	145	4,254
9:00 - 10:00	8	7	36	241	1	43	160	2,492	9	26	1,281	156	4,460 *



PERIOD: PM Peak Hour **DATE:** Wednesday January 31, 2007

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 3:15	7	0	10	76	0	12	25	334	5	3	304	81	857
3:15 - 3:30	6	0	11	62	0	15	12	399	5	1	408	75	994
3:30 - 3:45	2	1	6	78	2	12	20	382	2	1	361	69	936
3:45 - 4:00	0	0	6	84	0	9	24	373	2	2	309	75	884
4:00 - 4:15	2	1	12	102	0	2	24	321	1	1	271	83	820
4:15 - 4:30	6	1	13	62	2	5	14	383	1	2	344	68	901
4:30 - 4:45	1	0	8	71	1	4	26	367	6	1	299	73	857
4:45 - 5:00	1	2	5	78	0	5	42	358	5	3	288	90	877
5:00 - 5:15	0	1	7	75	1	4	19	321	2	2	344	72	848
5:15 - 5:30	0	0	12	68	0	2	18	310	3	6	336	69	824
5:30 - 5:45	0	0	3	55	0	6	21	357	0	5	319	55	821
5:45 - 6:00	1	1	3	58	0	6	17	348	2	2	289	51	778

1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 4:00	15	1	33	300	2	48	81	1,488	14	7	1,382	300	3,671 *
3:15 - 4:15	10	2	35	326	2	38	80	1,475	10	5	1,349	302	3,634
3:30 - 4:30	10	3	37	326	4	28	82	1,459	6	6	1,285	295	3,541
3:45 - 4:45	9	2	39	319	3	20	88	1,444	10	6	1,223	299	3,462
4:00 - 5:00	10	4	38	313	3	16	106	1,429	13	7	1,202	314	3,455
4:15 - 5:15	8	4	33	286	4	18	101	1,429	14	8	1,275	303	3,483
4:30 - 5:30	2	3	32	292	2	15	105	1,356	16	12	1,267	304	3,406
4:45 - 5:45	1	3	27	276	1	17	100	1,346	10	16	1,287	286	3,370
5:00 - 6:00	1	2	25	256	1	18	75	1,336	7	15	1,288	247	3,271



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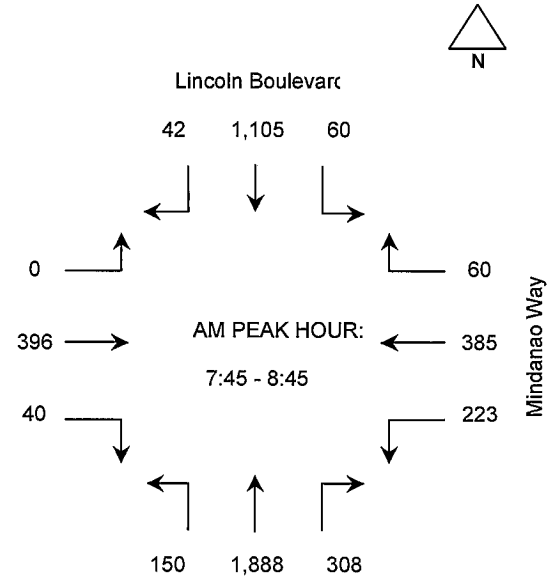
VEHICLE TURNING MOVEMENT COUNT SUMMARY

N/S STREET: Lincoln Boulevard **E/W STREET:** Mindanao Way

PERIOD: AM Peak Hour **DATE:** Thursday January 25, 2007

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 7:15	31	63	12	0	66	4	17	425	77	14	151	7	867
7:15 - 7:30	30	31	19	0	111	6	18	448	66	19	159	5	912
7:30 - 7:45	48	51	14	0	114	5	29	461	64	9	251	11	1,057
7:45 - 8:00	54	84	12	0	51	12	41	489	70	10	298	9	1,130
8:00 - 8:15	63	112	19	0	111	3	51	454	84	19	243	15	1,174
8:15 - 8:30	45	88	13	0	132	14	27	492	81	17	253	8	1,170
8:30 - 8:45	61	101	16	0	102	11	31	453	73	14	311	10	1,183
8:45 - 9:00	40	92	19	0	98	13	20	411	69	19	270	11	1,062
9:00 - 9:15	66	108	21	0	122	16	24	385	63	16	319	16	1,156
9:15 - 9:30	54	95	11	0	102	14	16	410	66	21	348	15	1,152
9:30 - 9:45	50	80	18	0	95	11	14	392	54	20	301	20	1,055
9:45 - 10:00	61	98	22	0	137	15	12	362	61	23	236	25	1,052

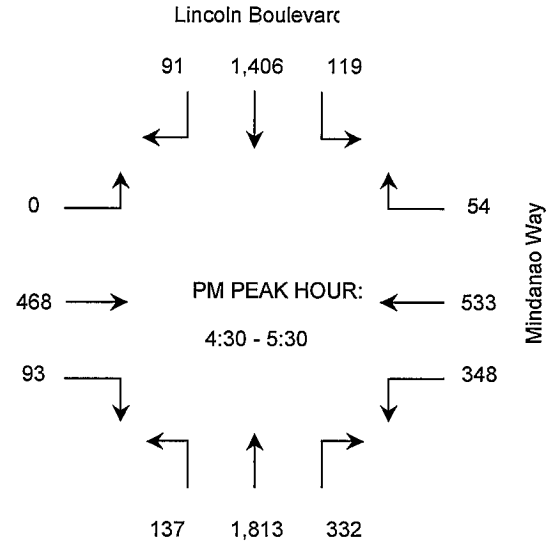
1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 8:00	163	229	57	0	342	27	105	1,823	277	52	859	32	3,966
7:15 - 8:15	195	278	64	0	387	26	139	1,852	284	57	951	40	4,273
7:30 - 8:30	210	335	58	0	408	34	148	1,896	299	55	1,045	43	4,531
7:45 - 8:45	223	385	60	0	396	40	150	1,888	308	60	1,105	42	4,657 *
8:00 - 9:00	209	393	67	0	443	41	129	1,810	307	69	1,077	44	4,589
8:15 - 9:15	212	389	69	0	454	54	102	1,741	286	66	1,153	45	4,571
8:30 - 9:30	221	396	67	0	424	54	91	1,659	271	70	1,248	52	4,553
8:45 - 9:45	210	375	69	0	417	54	74	1,598	252	76	1,238	62	4,425
9:00 - 10:00	231	381	72	0	456	56	66	1,549	244	80	1,204	76	4,415



PERIOD: PM Peak Hour **DATE:** Thursday January 25, 2007

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 3:15	98	138	20	0	104	29	25	336	43	28	334	18	1,173
3:15 - 3:30	101	77	18	0	132	31	28	393	82	31	390	12	1,295
3:30 - 3:45	106	138	24	0	142	27	31	315	54	29	318	39	1,223
3:45 - 4:00	97	122	19	0	80	20	33	357	67	30	384	19	1,228
4:00 - 4:15	70	88	11	0	143	25	35	387	72	29	410	33	1,303
4:15 - 4:30	72	99	10	0	132	22	30	431	70	28	342	18	1,254
4:30 - 4:45	74	133	12	0	145	35	30	418	78	28	362	19	1,334
4:45 - 5:00	81	102	14	0	85	18	35	427	80	31	342	22	1,237
5:00 - 5:15	96	148	16	0	135	19	35	537	83	28	377	26	1,500
5:15 - 5:30	97	150	12	0	103	21	37	431	91	32	325	24	1,323
5:30 - 5:45	90	152	18	0	109	17	44	365	100	38	309	31	1,273
5:45 - 6:00	111	141	14	0	101	24	39	369	104	27	271	21	1,222

1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 4:00	402	475	81	0	458	107	117	1,401	246	118	1,426	88	4,919
3:15 - 4:15	374	425	72	0	497	103	127	1,452	275	119	1,502	103	5,049
3:30 - 4:30	345	447	64	0	497	94	129	1,490	263	116	1,454	109	5,008
3:45 - 4:45	313	442	52	0	500	102	128	1,593	287	115	1,498	89	5,119
4:00 - 5:00	297	422	47	0	505	100	130	1,663	300	116	1,456	92	5,128
4:15 - 5:15	323	482	52	0	497	94	130	1,813	311	115	1,423	85	5,325
4:30 - 5:30	348	533	54	0	468	93	137	1,813	332	119	1,406	91	5,394 *
4:45 - 5:45	364	552	60	0	432	75	151	1,760	354	129	1,353	103	5,333
5:00 - 6:00	394	591	60	0	448	81	155	1,702	378	125	1,282	102	5,318



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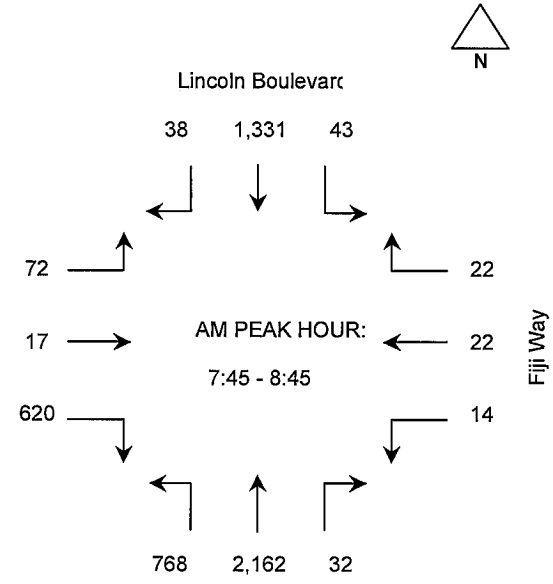
VEHICLE TURNING MOVEMENT COUNT SUMMARY

N/S STREET: Lincoln Boulevard **E/W STREET:** Fiji Way

PERIOD: AM Peak Hour **DATE:** Thursday January 25, 2007

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 7:15	9	2	5	12	4	88	136	515	5	4	168	15	963
7:15 - 7:30	3	4	3	13	2	91	139	509	4	7	190	12	977
7:30 - 7:45	3	3	3	15	5	109	174	511	9	5	299	11	1,147
7:45 - 8:00	2	5	4	15	3	136	185	536	7	9	345	7	1,254
8:00 - 8:15	2	4	6	24	4	147	203	530	10	10	291	14	1,245
8:15 - 8:30	4	4	3	17	3	163	211	572	8	9	333	8	1,335
8:30 - 8:45	6	9	9	16	7	174	169	524	7	15	362	9	1,307
8:45 - 9:00	7	10	7	19	7	160	159	480	11	17	327	10	1,214
9:00 - 9:15	4	6	8	18	8	154	141	455	6	14	384	12	1,210
9:15 - 9:30	6	0	3	5	3	109	133	485	7	10	381	15	1,157
9:30 - 9:45	7	5	10	10	5	117	145	431	10	9	346	11	1,106
9:45 - 10:00	4	4	4	15	7	104	96	435	5	10	292	10	986

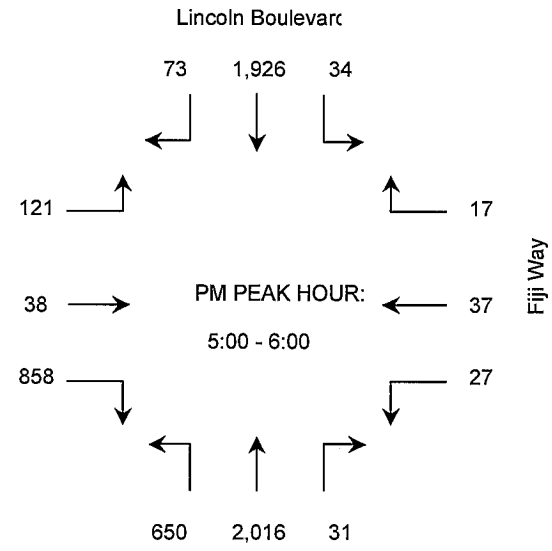
1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 8:00	17	14	15	55	14	424	634	2,071	25	25	1,002	45	4,341
7:15 - 8:15	10	16	16	67	14	483	701	2,086	30	31	1,125	44	4,623
7:30 - 8:30	11	16	16	71	15	555	773	2,149	34	33	1,268	40	4,981
7:45 - 8:45	14	22	22	72	17	620	768	2,162	32	43	1,331	38	5,141 *
8:00 - 9:00	19	27	25	76	21	644	742	2,106	36	51	1,313	41	5,101
8:15 - 9:15	21	29	27	70	25	651	680	2,031	32	55	1,406	39	5,066
8:30 - 9:30	23	25	27	58	25	597	602	1,944	31	56	1,454	46	4,888
8:45 - 9:45	24	21	28	52	23	540	578	1,851	34	50	1,438	48	4,687
9:00 - 10:00	21	15	25	48	23	484	515	1,806	28	43	1,403	48	4,459



PERIOD: PM Peak Hour **DATE:** Thursday January 25, 2007

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 3:15	8	7	5	25	2	179	126	342	9	8	395	21	1,127
3:15 - 3:30	6	4	8	15	4	216	168	443	8	11	478	20	1,381
3:30 - 3:45	4	7	10	17	4	203	151	377	5	9	427	18	1,232
3:45 - 4:00	8	6	9	21	5	191	160	411	10	7	461	24	1,313
4:00 - 4:15	9	7	9	28	7	208	169	534	11	3	375	17	1,377
4:15 - 4:30	10	6	10	31	6	211	149	503	10	6	404	18	1,364
4:30 - 4:45	7	9	13	24	10	201	171	488	4	5	422	21	1,375
4:45 - 5:00	7	9	9	25	5	187	188	512	8	7	417	11	1,385
5:00 - 5:15	9	9	5	26	9	236	210	493	3	12	439	16	1,467
5:15 - 5:30	7	10	5	36	10	204	179	489	15	10	492	22	1,479
5:30 - 5:45	6	11	3	30	11	207	122	523	4	9	507	20	1,453
5:45 - 6:00	5	7	4	29	8	211	139	511	9	3	488	15	1,429

1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 4:00	26	24	32	78	15	789	605	1,573	32	35	1,761	83	5,053
3:15 - 4:15	27	24	36	81	20	818	648	1,765	34	30	1,741	79	5,303
3:30 - 4:30	31	26	38	97	22	813	629	1,825	36	25	1,667	77	5,286
3:45 - 4:45	34	28	41	104	28	811	649	1,936	35	21	1,662	80	5,429
4:00 - 5:00	33	31	41	108	28	807	677	2,037	33	21	1,618	67	5,501
4:15 - 5:15	33	33	37	106	30	835	718	1,996	25	30	1,682	66	5,591
4:30 - 5:30	30	37	32	111	34	828	748	1,982	30	34	1,770	70	5,706
4:45 - 5:45	29	39	22	117	35	834	699	2,017	30	38	1,855	69	5,784
5:00 - 6:00	27	37	17	121	38	858	650	2,016	31	34	1,926	73	5,828 *



Crain & Associates
2007 Sawtelle Blvd., Suite 4
Los Angeles, CA 90025
Tel: (310) 473-6508

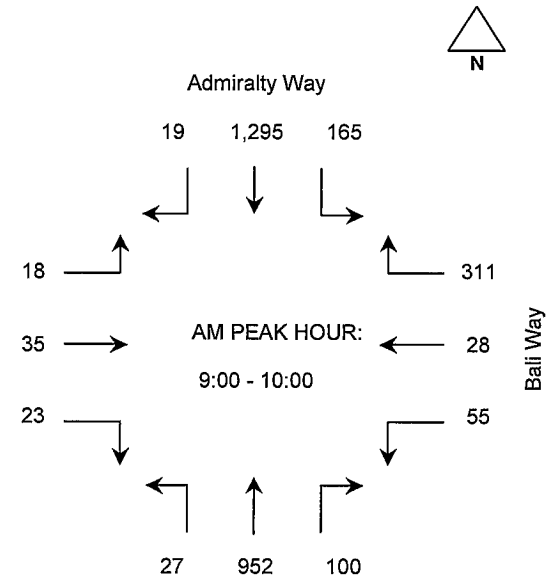
VEHICLE TURNING MOVEMENT COUNT SUMMARY

N/S STREET: Admiralty Way **E/W STREET:** Bali Way

PERIOD: AM Peak Hour **DATE:** Tuesday January 30, 2007

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 7:15	0	0	45	0	0	0	1	123	8	15	125	0	317
7:15 - 7:30	3	12	24	1	9	2	2	210	5	22	177	1	468
7:30 - 7:45	2	8	32	1	4	0	2	212	7	21	186	1	476
7:45 - 8:00	0	1	52	1	2	1	0	207	10	16	195	0	485
8:00 - 8:15	8	7	51	4	10	2	4	233	4	35	240	0	598
8:15 - 8:30	4	6	46	8	7	1	5	256	5	39	229	1	607
8:30 - 8:45	6	5	39	2	4	1	6	246	5	40	248	1	603
8:45 - 9:00	4	5	42	1	4	1	4	251	7	36	239	0	594
9:00 - 9:15	8	9	54	1	8	3	3	180	14	27	252	2	561
9:15 - 9:30	5	6	111	2	6	6	5	190	15	37	249	5	637
9:30 - 9:45	16	7	83	6	9	6	8	226	29	51	346	5	792
9:45 - 10:00	26	6	63	9	12	8	11	356	42	50	448	7	1,038

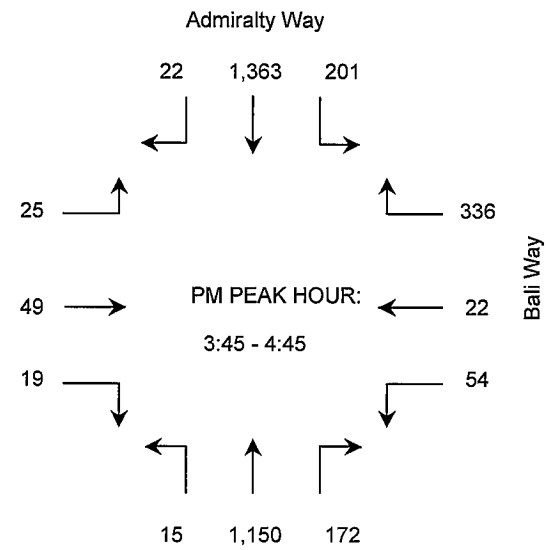
1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 8:00	5	21	153	3	15	3	5	752	30	74	683	2	1,746
7:15 - 8:15	13	28	159	7	25	5	8	862	26	94	798	2	2,027
7:30 - 8:30	14	22	181	14	23	4	11	908	26	111	850	2	2,166
7:45 - 8:45	18	19	188	15	23	5	15	942	24	130	912	2	2,293
8:00 - 9:00	22	23	178	15	25	5	19	986	21	150	956	2	2,402
8:15 - 9:15	22	25	181	12	23	6	18	933	31	142	968	4	2,365
8:30 - 9:30	23	25	246	6	22	11	18	867	41	140	988	8	2,395
8:45 - 9:45	33	27	290	10	27	16	20	847	65	151	1,086	12	2,584
9:00 - 10:00	55	28	311	18	35	23	27	952	100	165	1,295	19	3,028 *



PERIOD: PM Peak Hour **DATE:** Tuesday January 30, 2007

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 3:15	12	12	73	17	10	2	6	242	30	51	310	7	772
3:15 - 3:30	10	6	97	15	12	1	0	271	38	53	330	10	843
3:30 - 3:45	10	7	73	5	6	3	5	284	30	29	326	6	784
3:45 - 4:00	3	10	93	4	5	3	3	261	22	54	359	5	822
4:00 - 4:15	12	6	82	6	10	4	3	286	43	57	353	7	869
4:15 - 4:30	24	3	66	6	14	3	3	319	60	51	342	8	899
4:30 - 4:45	15	3	95	9	20	9	6	284	47	39	309	2	838
4:45 - 5:00	13	5	86	7	16	6	5	272	51	34	312	2	809
5:00 - 5:15	33	7	85	5	7	0	0	264	31	33	338	1	804
5:15 - 5:30	28	5	76	2	6	2	2	311	32	42	355	4	865
5:30 - 5:45	22	7	62	3	6	8	4	306	36	51	362	7	874
5:45 - 6:00	27	1	75	1	5	3	0	282	31	39	284	3	751

1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 4:00	35	35	336	41	33	9	14	1,058	120	187	1,325	28	3,221
3:15 - 4:15	35	29	345	30	33	11	11	1,102	133	193	1,368	28	3,318
3:30 - 4:30	49	26	314	21	35	13	14	1,150	155	191	1,380	26	3,374
3:45 - 4:45	54	22	336	25	49	19	15	1,150	172	201	1,363	22	3,428 *
4:00 - 5:00	64	17	329	28	60	22	17	1,161	201	181	1,316	19	3,415
4:15 - 5:15	85	18	332	27	57	18	14	1,139	189	157	1,301	13	3,350
4:30 - 5:30	89	20	342	23	49	17	13	1,131	161	148	1,314	9	3,316
4:45 - 5:45	96	24	309	17	35	16	11	1,153	150	160	1,367	14	3,352
5:00 - 6:00	110	20	298	11	24	13	6	1,163	130	165	1,339	15	3,294



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2007 Sawtelle Blvd., Suite 4
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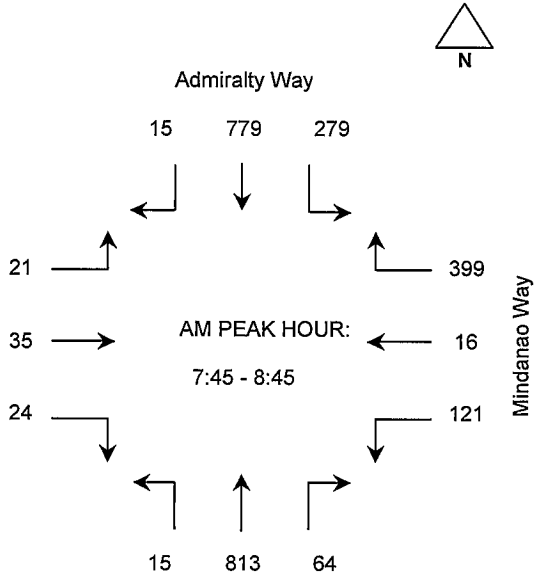
VEHICLE TURNING MOVEMENT COUNT SUMMARY

N/S STREET: Admiralty Way **E/W STREET:** Mindanao Way
PERIOD: AM Peak Hour **DATE:** Wednesday January 24, 2007

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 7:15	18	5	60	0	0	1	5	98	6	62	76	4	335
7:15 - 7:30	16	2	64	2	4	5	2	136	6	82	89	2	410
7:30 - 7:45	18	3	72	3	5	8	1	154	11	100	116	3	494
7:45 - 8:00	18	6	98	10	12	5	1	187	10	65	225	3	640
8:00 - 8:15	27	4	110	2	12	7	5	208	20	69	201	4	669
8:15 - 8:30	34	6	93	6	8	6	3	197	10	71	189	3	626
8:30 - 8:45	42	0	98	3	3	6	6	221	24	74	164	5	646
8:45 - 9:00	24	4	91	6	4	3	2	180	16	92	117	2	541
9:00 - 9:15	28	8	72	2	2	1	5	160	21	64	138	3	504
9:15 - 9:30	42	12	84	2	3	0	2	139	39	67	148	5	543
9:30 - 9:45	33	8	56	0	3	0	10	146	25	59	116	1	457
9:45 - 10:00	29	7	42	1	2	0	5	98	15	62	119	2	382

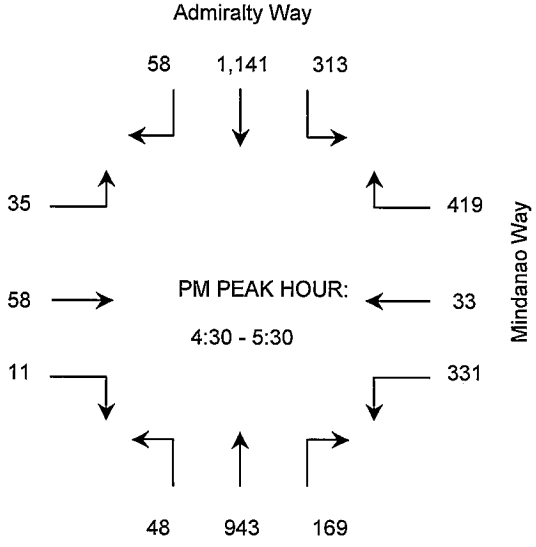
1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 8:00	70	16	294	15	21	19	9	575	33	309	506	12	1,879
7:15 - 8:15	79	15	344	17	33	25	9	685	47	316	631	12	2,213
7:30 - 8:30	97	19	373	21	37	26	10	746	51	305	731	13	2,429
7:45 - 8:45	121	16	399	21	35	24	15	813	64	279	779	15	2,581 *
8:00 - 9:00	127	14	392	17	27	22	16	806	70	306	671	14	2,482
8:15 - 9:15	128	18	354	17	17	16	16	758	71	301	608	13	2,317
8:30 - 9:30	136	24	345	13	12	10	15	700	100	297	567	15	2,234
8:45 - 9:45	127	32	303	10	12	4	19	625	101	282	519	11	2,045
9:00 - 10:00	132	35	254	5	10	1	22	543	100	252	521	11	1,886



PERIOD: PM Peak Hour **DATE:** Wednesday January 24, 2007

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 3:15	60	5	108	5	10	2	3	161	37	59	178	1	629
3:15 - 3:30	61	14	61	0	2	6	3	156	42	98	136	0	579
3:30 - 3:45	79	6	68	2	6	4	2	172	37	82	173	8	639
3:45 - 4:00	95	4	73	0	8	2	0	156	29	63	228	12	670
4:00 - 4:15	69	7	69	6	8	3	7	158	31	82	259	8	707
4:15 - 4:30	45	9	72	6	11	2	7	163	36	104	295	7	757
4:30 - 4:45	114	16	140	11	20	5	14	209	57	80	296	10	972
4:45 - 5:00	59	3	77	3	5	2	5	155	24	73	269	7	682
5:00 - 5:15	73	6	84	5	14	1	8	281	40	76	270	18	876
5:15 - 5:30	85	8	118	16	19	3	21	298	48	84	306	23	1,029
5:30 - 5:45	72	7	110	10	10	2	8	168	36	71	329	12	835
5:45 - 6:00	62	11	106	5	6	3	7	164	47	63	229	8	711

1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 4:00	295	29	310	7	26	14	8	645	145	302	715	21	2,517
3:15 - 4:15	304	31	271	8	24	15	12	642	139	325	796	28	2,595
3:30 - 4:30	288	26	282	14	33	11	16	649	133	331	955	35	2,773
3:45 - 4:45	323	36	354	23	47	12	28	686	153	329	1,078	37	3,106
4:00 - 5:00	287	35	358	26	44	12	33	685	148	339	1,119	32	3,118
4:15 - 5:15	291	34	373	25	50	10	34	808	157	333	1,130	42	3,287
4:30 - 5:30	331	33	419	35	58	11	48	943	169	313	1,141	58	3,559 *
4:45 - 5:45	289	24	389	34	48	8	42	902	148	304	1,174	60	3,422
5:00 - 6:00	292	32	418	36	49	9	44	911	171	294	1,134	61	3,451



Crain & Associates
2007 Sawtelle Blvd., Suite 4
Los Angeles, CA 90025
Tel: (310) 473-6508

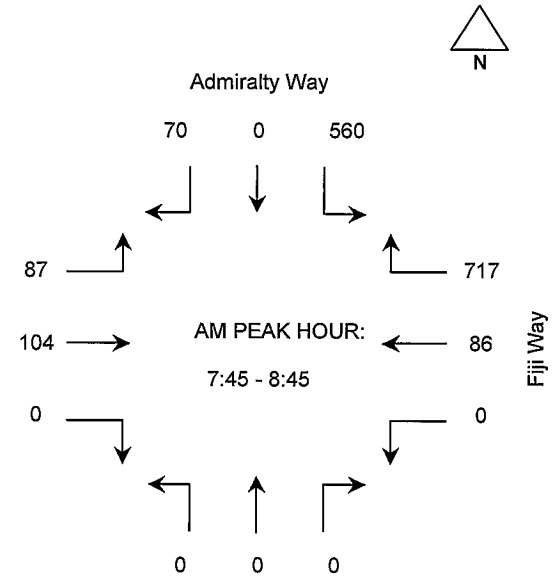
VEHICLE TURNING MOVEMENT COUNT SUMMARY

N/S STREET: Admiralty Way **E/W STREET:** Fiji Way

PERIOD: AM Peak Hour **DATE:** Wednesday January 24, 2007

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 7:15	0	33	86	17	15	0	0	0	0	83	0	19	253
7:15 - 7:30	0	27	122	20	30	0	0	0	0	89	0	16	304
7:30 - 7:45	0	22	162	16	24	0	0	0	0	114	0	13	351
7:45 - 8:00	0	25	177	23	18	0	0	0	0	124	0	21	388
8:00 - 8:15	0	27	204	21	29	0	0	0	0	133	0	24	438
8:15 - 8:30	0	16	191	19	30	0	0	0	0	162	0	17	435
8:30 - 8:45	0	18	145	24	27	0	0	0	0	141	0	8	363
8:45 - 9:00	0	9	159	16	22	0	0	0	0	148	0	12	366
9:00 - 9:15	0	11	144	30	17	0	0	0	0	141	0	14	357
9:15 - 9:30	0	17	140	21	22	0	0	0	0	111	0	10	321
9:30 - 9:45	0	20	113	19	19	0	0	0	0	92	0	16	279
9:45 - 10:00	0	23	84	28	20	0	0	0	0	109	0	26	290

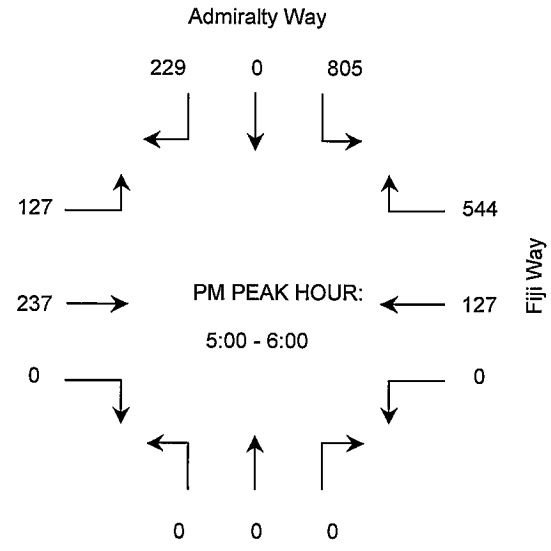
1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 8:00	0	107	547	76	87	0	0	0	0	410	0	69	1,296
7:15 - 8:15	0	101	665	80	101	0	0	0	0	460	0	74	1,481
7:30 - 8:30	0	90	734	79	101	0	0	0	0	533	0	75	1,612
7:45 - 8:45	0	86	717	87	104	0	0	0	0	560	0	70	1,624 *
8:00 - 9:00	0	70	699	80	108	0	0	0	0	584	0	61	1,602
8:15 - 9:15	0	54	639	89	96	0	0	0	0	592	0	51	1,521
8:30 - 9:30	0	55	588	91	88	0	0	0	0	541	0	44	1,407
8:45 - 9:45	0	57	556	86	80	0	0	0	0	492	0	52	1,323
9:00 - 10:00	0	71	481	98	78	0	0	0	0	453	0	66	1,247



PERIOD: PM Peak Hour **DATE:** Wednesday January 24, 2007

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 3:15	0	24	111	24	31	0	0	0	0	181	0	33	404
3:15 - 3:30	0	28	158	19	40	0	0	0	0	222	0	25	492
3:30 - 3:45	0	22	108	26	46	0	0	0	0	180	0	30	412
3:45 - 4:00	0	34	115	16	33	0	0	0	0	213	0	27	438
4:00 - 4:15	0	30	151	23	53	0	0	0	0	222	0	41	520
4:15 - 4:30	0	21	145	11	61	0	0	0	0	201	0	45	484
4:30 - 4:45	0	28	166	18	50	0	0	0	0	209	0	27	498
4:45 - 5:00	0	30	160	22	42	0	0	0	0	194	0	40	488
5:00 - 5:15	0	31	169	30	55	0	0	0	0	217	0	59	561
5:15 - 5:30	0	29	144	29	59	0	0	0	0	197	0	54	512
5:30 - 5:45	0	27	117	35	62	0	0	0	0	201	0	65	507
5:45 - 6:00	0	40	114	33	61	0	0	0	0	190	0	51	489

1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 4:00	0	108	492	85	150	0	0	0	0	796	0	115	1,746
3:15 - 4:15	0	114	532	84	172	0	0	0	0	837	0	123	1,862
3:30 - 4:30	0	107	519	76	193	0	0	0	0	816	0	143	1,854
3:45 - 4:45	0	113	577	68	197	0	0	0	0	845	0	140	1,940
4:00 - 5:00	0	109	622	74	206	0	0	0	0	826	0	153	1,990
4:15 - 5:15	0	110	640	81	208	0	0	0	0	821	0	171	2,031
4:30 - 5:30	0	118	639	99	206	0	0	0	0	817	0	180	2,059
4:45 - 5:45	0	117	590	116	218	0	0	0	0	809	0	218	2,068
5:00 - 6:00	0	127	544	127	237	0	0	0	0	805	0	229	2,069 *



Crain & Associates
2007 Sawtelle Blvd., Suite 4
Los Angeles, CA 90025
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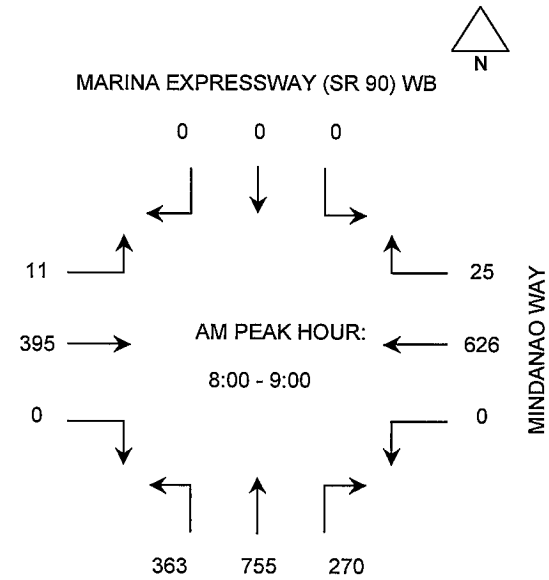
VEHICLE TURNING MOVEMENT COUNT SUMMARY

N/S STREET: MARINA EXPRESSWAY (SR 90) WB **E/W STREET:** MINDANAO WAY

PERIOD: AM PEAK HOUR **DATE:** THURSDAY JUNE 8, 2006

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 7:15	0	86	4	3	39	0	60	173	45	0	0	0	410
7:15 - 7:30	0	109	3	0	65	0	50	234	67	0	0	0	528
7:30 - 7:45	0	113	2	5	76	0	82	215	96	0	0	0	589
7:45 - 8:00	0	123	3	2	76	0	81	190	96	0	0	0	571
8:00 - 8:15	0	148	2	2	89	0	90	193	57	0	0	0	581
8:15 - 8:30	0	184	11	2	98	0	88	176	58	0	0	0	617
8:30 - 8:45	0	140	6	4	97	0	95	182	78	0	0	0	602
8:45 - 9:00	0	154	6	3	111	0	90	204	77	0	0	0	645
9:00 - 9:15	0	111	6	2	84	0	85	186	82	0	0	0	556
9:15 - 9:30	0	132	5	2	93	0	79	172	52	0	0	0	535
9:30 - 9:45	0	150	4	3	95	0	87	190	77	0	0	0	606
9:45 - 10:00	0	140	6	4	94	0	70	199	50	0	0	0	563

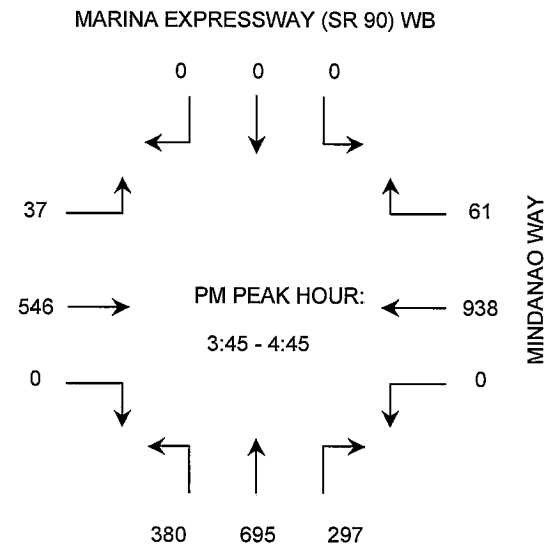
1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 8:00	0	431	12	10	256	0	273	812	304	0	0	0	2,098
7:15 - 8:15	0	493	10	9	306	0	303	832	316	0	0	0	2,269
7:30 - 8:30	0	568	18	11	339	0	341	774	307	0	0	0	2,358
7:45 - 8:45	0	595	22	10	360	0	354	741	289	0	0	0	2,371
8:00 - 9:00	0	626	25	11	395	0	363	755	270	0	0	0	2,445 *
8:15 - 9:15	0	589	29	11	390	0	358	748	295	0	0	0	2,420
8:30 - 9:30	0	537	23	11	385	0	349	744	289	0	0	0	2,338
8:45 - 9:45	0	547	21	10	383	0	341	752	288	0	0	0	2,342
9:00 - 10:00	0	533	21	11	366	0	321	747	261	0	0	0	2,260



PERIOD: PM PEAK HOUR **DATE:** THURSDAY JUNE 8, 2006

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 3:15	0	222	10	4	150	0	98	158	67	0	0	0	709
3:15 - 3:30	0	193	9	1	125	0	112	170	69	0	0	0	679
3:30 - 3:45	0	224	14	9	151	0	97	145	73	0	0	0	713
3:45 - 4:00	0	238	11	5	180	0	100	186	77	0	0	0	797
4:00 - 4:15	0	240	12	9	128	0	103	170	69	0	0	0	731
4:15 - 4:30	0	200	18	14	126	0	83	166	81	0	0	0	688
4:30 - 4:45	0	260	20	9	112	0	94	173	70	0	0	0	738
4:45 - 5:00	0	230	12	7	116	0	108	166	67	0	0	0	706
5:00 - 5:15	0	250	14	8	122	0	109	140	77	0	0	0	720
5:15 - 5:30	0	253	19	11	124	0	100	156	80	0	0	0	743
5:30 - 5:45	0	251	12	7	122	0	96	199	71	0	0	0	758
5:45 - 6:00	0	227	10	6	126	0	87	179	61	0	0	0	696

1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 4:00	0	877	44	19	606	0	407	659	286	0	0	0	2,898
3:15 - 4:15	0	895	46	24	584	0	412	671	288	0	0	0	2,920
3:30 - 4:30	0	902	55	37	585	0	383	667	300	0	0	0	2,929
3:45 - 4:45	0	938	61	37	546	0	380	695	297	0	0	0	2,954 *
4:00 - 5:00	0	930	62	39	482	0	388	675	287	0	0	0	2,863
4:15 - 5:15	0	940	64	38	476	0	394	645	295	0	0	0	2,852
4:30 - 5:30	0	993	65	35	474	0	411	635	294	0	0	0	2,907
4:45 - 5:45	0	984	57	33	484	0	413	661	295	0	0	0	2,927
5:00 - 6:00	0	981	55	32	494	0	392	674	289	0	0	0	2,917



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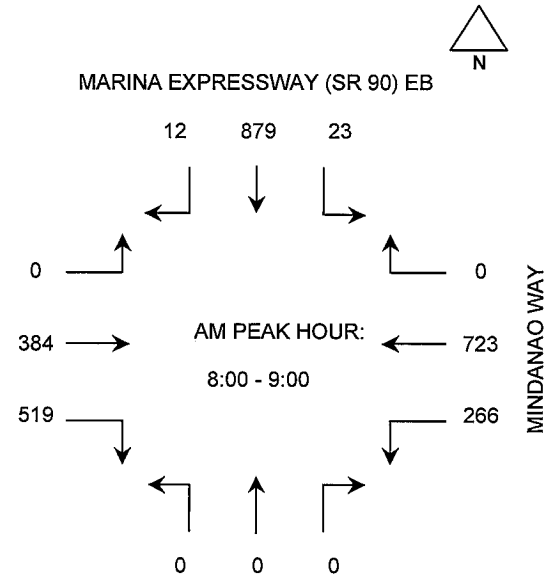
VEHICLE TURNING MOVEMENT COUNT SUMMARY

N/S STREET: MARINA EXPRESSWAY (SR 90) EB **E/W STREET:** MINDANAO WAY

PERIOD: AM PEAK HOUR **DATE:** THURSDAY JUNE 8, 2006

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 7:15	40	106	0	0	40	124	0	0	0	2	117	4	433
7:15 - 7:30	52	107	0	0	62	120	0	0	0	3	162	0	506
7:30 - 7:45	57	138	0	0	75	121	0	0	0	6	180	1	578
7:45 - 8:00	60	144	0	0	77	149	0	0	0	1	191	4	626
8:00 - 8:15	66	172	0	0	86	150	0	0	0	5	198	4	681
8:15 - 8:30	74	198	0	0	93	153	0	0	0	8	223	5	754
8:30 - 8:45	65	170	0	0	95	96	0	0	0	6	210	2	644
8:45 - 9:00	61	183	0	0	110	120	0	0	0	4	248	1	727
9:00 - 9:15	50	146	0	0	81	104	0	0	0	5	148	3	537
9:15 - 9:30	61	150	0	0	87	115	0	0	0	8	200	2	623
9:30 - 9:45	69	168	0	0	95	98	0	0	0	3	160	6	599
9:45 - 10:00	51	159	0	0	90	96	0	0	0	8	129	4	537

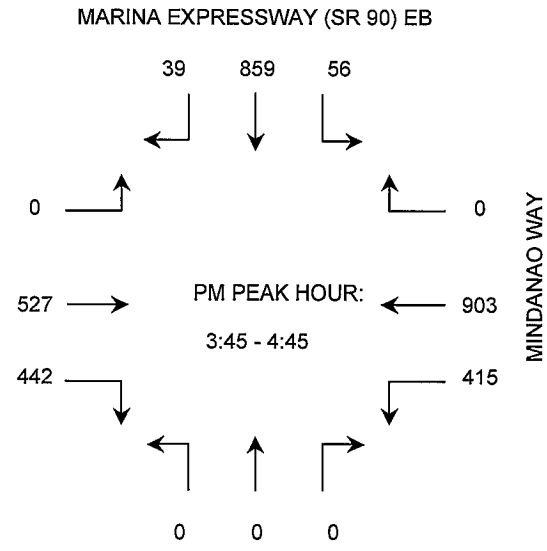
1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
7:00 - 8:00	209	495	0	0	254	514	0	0	0	12	650	9	2,143
7:15 - 8:15	235	561	0	0	300	540	0	0	0	15	731	9	2,391
7:30 - 8:30	257	652	0	0	331	573	0	0	0	20	792	14	2,639
7:45 - 8:45	265	684	0	0	351	548	0	0	0	20	822	15	2,705
8:00 - 9:00	266	723	0	0	384	519	0	0	0	23	879	12	2,806 *
8:15 - 9:15	250	697	0	0	379	473	0	0	0	23	829	11	2,662
8:30 - 9:30	237	649	0	0	373	435	0	0	0	23	806	8	2,531
8:45 - 9:45	241	647	0	0	373	437	0	0	0	20	756	12	2,486
9:00 - 10:00	231	623	0	0	353	413	0	0	0	24	637	15	2,296



PERIOD: PM PEAK HOUR **DATE:** THURSDAY JUNE 8, 2006

15-MINUTE	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 3:15	95	225	0	0	139	126	0	0	0	15	205	8	813
3:15 - 3:30	96	209	0	0	114	101	0	0	0	12	157	6	695
3:30 - 3:45	92	229	0	0	135	107	0	0	0	25	165	17	770
3:45 - 4:00	89	249	0	0	157	101	0	0	0	28	253	16	893
4:00 - 4:15	123	220	0	0	125	141	0	0	0	12	235	12	868
4:15 - 4:30	86	197	0	0	131	98	0	0	0	9	151	4	676
4:30 - 4:45	117	237	0	0	114	102	0	0	0	7	220	7	804
4:45 - 5:00	103	235	0	0	109	96	0	0	0	14	196	8	761
5:00 - 5:15	93	266	0	0	115	116	0	0	0	15	212	2	819
5:15 - 5:30	93	260	0	0	130	128	0	0	0	5	198	7	821
5:30 - 5:45	108	239	0	0	124	116	0	0	0	5	189	4	785
5:45 - 6:00	101	213	0	0	121	94	0	0	0	11	200	2	742

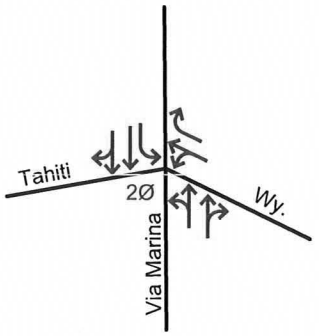
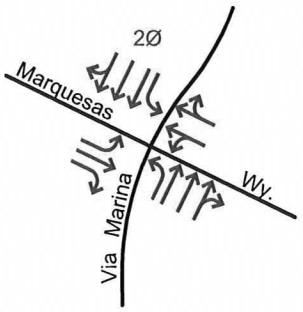
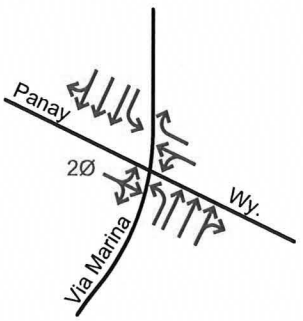
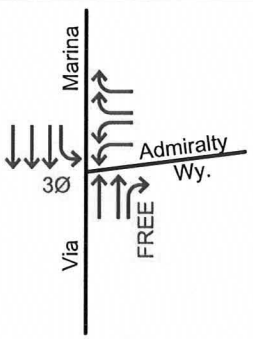
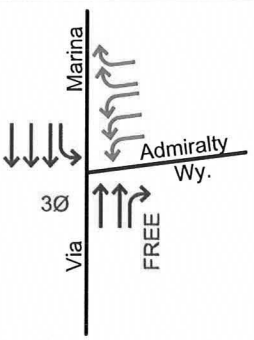
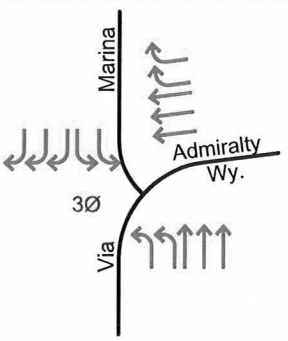
1-HOUR	WESTBOUND			EASTBOUND			NORTHBOUND			SOUTHBOUND			
TOTALS	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
3:00 - 4:00	372	912	0	0	545	435	0	0	0	80	780	47	3,171
3:15 - 4:15	400	907	0	0	531	450	0	0	0	77	810	51	3,226
3:30 - 4:30	390	895	0	0	548	447	0	0	0	74	804	49	3,207
3:45 - 4:45	415	903	0	0	527	442	0	0	0	56	859	39	3,241 *
4:00 - 5:00	429	889	0	0	479	437	0	0	0	42	802	31	3,109
4:15 - 5:15	399	935	0	0	469	412	0	0	0	45	779	21	3,060
4:30 - 5:30	406	998	0	0	468	442	0	0	0	41	826	24	3,205
4:45 - 5:45	397	1,000	0	0	478	456	0	0	0	39	795	21	3,186
5:00 - 6:00	395	978	0	0	490	454	0	0	0	36	799	15	3,167



APPENDIX G

EXISTING AND FUTURE LANE CONFIGURATIONS

NORTH

	Existing (2007) & Future (2013) WO Mitigation	Future (2013) With Project Mitigation	Future (2013) With Cumulative Mitigation
1 Tahiti Wy. & Via Marina		NONE NEEDED	NONE NEEDED
2 Marquesas Wy. & Via Marina		NONE NEEDED	NONE NEEDED
3 Panay Wy. & Via Marina		NONE NEEDED	NONE NEEDED
4 Admiralty Wy. & Via Marina			

LEGEND

- 3Ø Number of Signal Phases
- STOP Stop Sign Controlled
- FREE Free Right-Turn Movement
- OVL Overlap Phase

APPENDIX G

12/3/2007

FN: MARINA DEL REY LEGACY\REPORT(12-2007)\LANE-CONFIGS-1

EXISTING AND FUTURE
LANE CONFIGURATIONS

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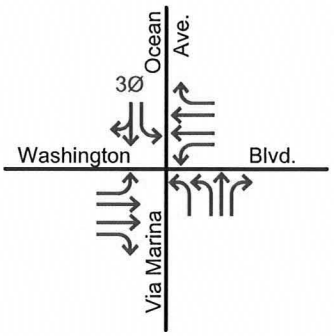
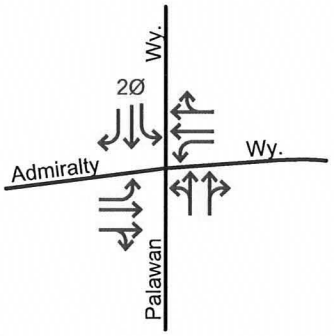
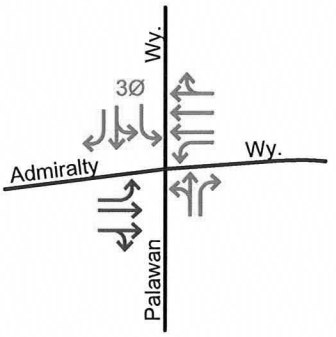
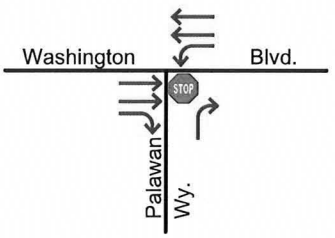
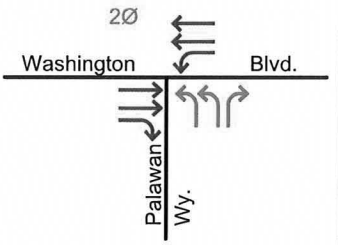
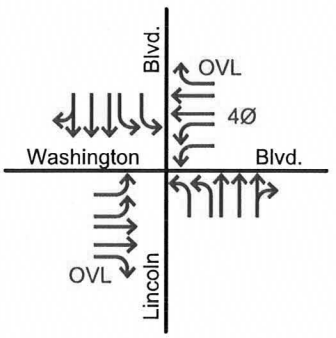
	Existing (2007) & Future (2013) WO Mitigation	Future (2013) With Project Mitigation	Future (2013) With Cumulative Mitigation
5 Washington Blvd. & Via Marina / Ocean Ave.		NO CHANGE	NO CHANGE
6 Admiralty Wy. & Palawan Wy.		NONE NEEDED	
7 Washington Blvd. & Palawan Wy.		NONE NEEDED	
8 Washington Blvd. & Lincoln Blvd.		NONE NEEDED	NO CHANGE

LEGEND

- 3Ø Number of Signal Phases
- STOP Stop Sign Controlled
- FREE Free Right-Turn Movement
- OVL Overlap Phase

APPENDIX G

12/3/2007

FN: MARINA DEL REY LEGACY\REPORT(12-2007)\LANE-CONFIGS-1

EXISTING AND FUTURE LANE CONFIGURATIONS

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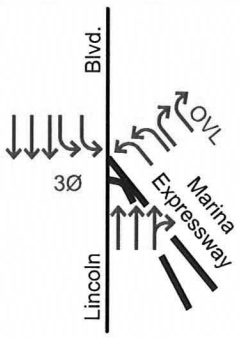
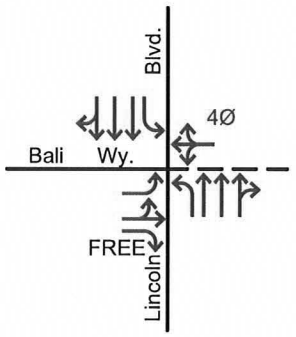
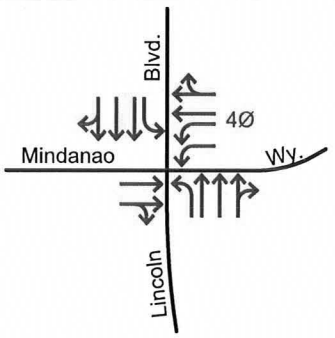
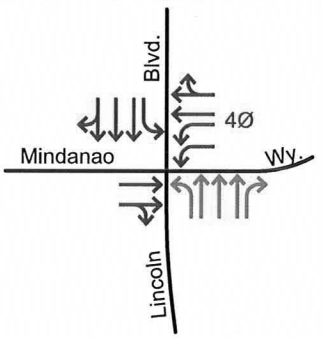
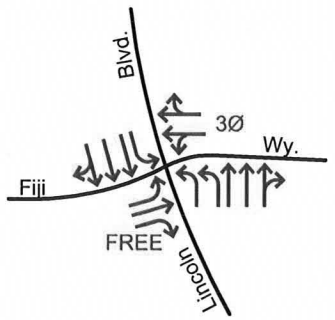
NORTH

	Existing (2007) & Future (2013) WO Mitigation	Future (2013) With Project Mitigation	Future (2013) With Cumulative Mitigation
9 Marina Expressway & Lincoln Blvd.		NONE NEEDED	NO CHANGE
10 Bali Wy. & Lincoln Blvd.		NONE NEEDED	NO CHANGE
11 Mindanao Wy. & Lincoln Blvd.			NO CHANGE
12 Fiji Wy. & Llincoln Blvd.		NONE NEEDED	NO CHANGE

LEGEND

- 3Ø Number of Signal Phases
- STOP Stop Sign Controlled
- FREE Free Right-Turn Movement
- OVL Overlap Phase

APPENDIX G

12/3/2007

FN: MARINA DEL REY LEGACY\REPORT(12-2007)\LANE-CONFIGS-1

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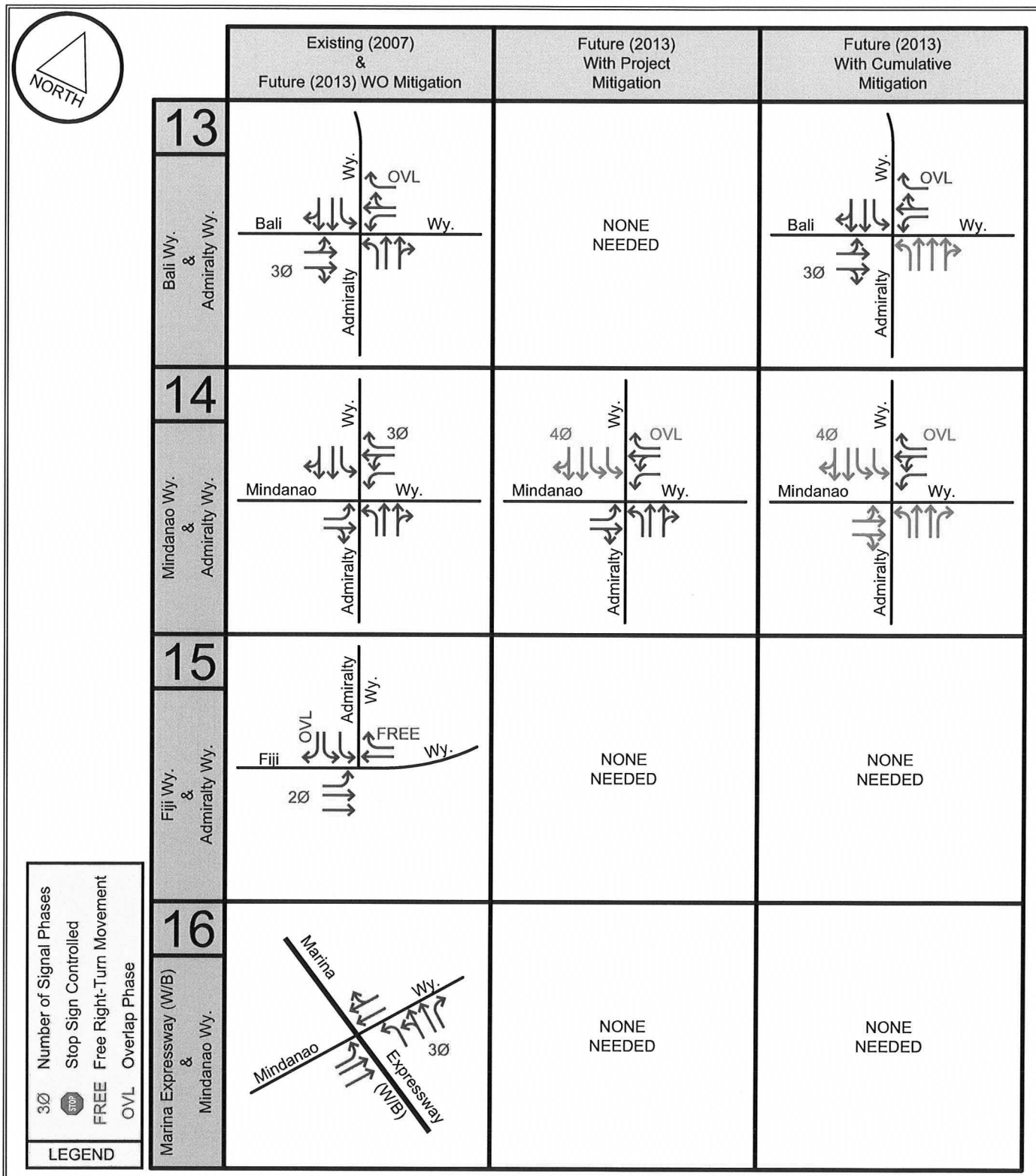

APPENDIX G

12/3/2007

FN: MARINA DEL REY LEGACY\REPORT(12-2007)\LANE-CONFIGS-1

EXISTING AND FUTURE LANE CONFIGURATIONS

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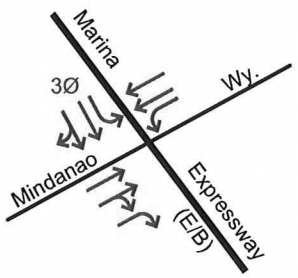
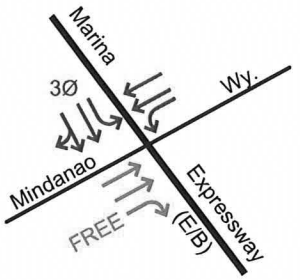
	Existing (2007) & Future (2013) WO Mitigation	Future (2013) With Project Mitigation	Future (2013) With Cumulative Mitigation
17 Marina Expressway (E/B) & Mindanao Wy.		NONE NEEDED	

LEGEND

3Ø Number of Signal Phases

STOP Stop Sign Controlled

FREE Free Right-Turn Movement

OVL Overlap Phase

APPENDIX G

12/3/2007

FN: MARINA DEL REY LEGACY\REPORT(12-2007)\LANE-CONFIGS-1

EXISTING AND FUTURE
LANE CONFIGURATIONS

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APPENDIX H

SHARED PARKING ANALYSIS FOR HOTEL/ TIMESHARE RESORT COMPONENT ON PARCEL 9U

APPENDIX H

SHARED PARKING ANALYSIS FOR HOTEL/ TIMESHARE RESORT COMPONENT ON PARCEL 9U

Appendix H analyzes the shared parking for the hotel/timeshare resort component of the project on Parcel 9U in Marina del Rey. The proposed hotel/timeshare resort consists of 152 hotel suites and 136 timeshare ownership units. The hotel suites include 135 one-bedroom units and 17 two-bedroom units. The timeshare ownership component includes 70 one-bedroom units and 66 two-bedroom units. In addition, the hotel/timeshare resort will have support facilities including a sundry shop, a ballroom, meeting rooms, and spa, restaurant and bar/lounge uses. Since the support facilities are inside the hotel/timeshare resort, many of the patrons of the support facilities are also guests of the hotel/timeshare resort. Thus, the parking for the hotel/timeshare resort component was analyzed as a mixed-use development. All hotel/timeshare resort uses will share the same parking supply and was taken into account.

As summarized in the table below, approximately 556 on-site parking spaces would be required by the proposed project if the land-uses were analyzed under the current County of Los Angeles Planning and Zoning Code as stand-alone facilities. The hotel/timeshare resort proposes a parking supply of approximately 316 marked spaces including 295 valet spaces and 21 self-park spaces. The self-park spaces would be located on the second parking level and the valet spaces would be located on all other levels. The parking facility can also accommodate an additional 44 valet aisle spaces on the valet parking levels. The combined marked and aisle spaces would result in a maximum total parking supply of 360 spaces. The parking spaces for the hotel/timeshare resort, including marked and aisle spaces, are shown in Attachment H-1, Hotel/Timeshare Resort Parking Layout.

Project Parking Requirement Assuming Stand-Alone Facilities
(Using County of Los Angeles Parking Code)

Proposed Project	Size	Parking Rate	Spaces Required
Hotel/Timeshare Resort	83 2-Bedrooms	1 / 1 Unit	83
	205 1-Bedroom	0.5 / 1 Unit	103
Sundry Shop	1,176 sf	4 / 1,000 sf	5
Spa (5,555 sf)	111 sf	1 / 3 Occupant	37
Ballroom (5,200 sf)	347 Occupants	1 / 3 Occupant	116
Meeting Room (3,400 sf)	227 Occupants	1 / 3 Occupant	76
Restaurant			
Customer Seating Area (3,140 sf)			
Outdoor Dining (1,840 sf)			
Bar Lounge (1,125 sf)			
Subtotal (6,105 sf)	407 Occupants	1 / 3 Occupant	136
Total Spaces Required Using Stand-alone Rates:			**556** [1]

[1] As noted above, when shared-use considerations are included as shown in Attachments H-2 and H-3, the site peak parking demand is 345 spaces, resulting in 15 surplus spaces.

However, the County code recognizes that stand-alone parking often does not reflect the true parking demand of a full-scale hotel development. Therefore, it allows for an analysis to be made of the hotel/timeshare resort uses on a shared parking basis. Shared parking is defined as parking spaces that can be used to serve two or more individual land uses without conflict or encroachment. The shared parking calculations were performed using methodologies and data provided in the 2005 Urban Land Institute (ULI) publication on the subject, Shared Parking, adjusted to reflect the unique characteristics of the project vicinity and the needs and requirements of the County.

The maximum parking demand is typically calculated by applying the appropriate code parking ratio to the subject land use. For this analysis, the current County code parking rates were applied to establish the baseline maximum parking demand for the project.

In addition, Shared Parking also provides parking rates for hotel employees. The County code, which includes both customers and employees, was split into these two groups based on ULI data.

The shared parking methodology recognizes that parking demand for various uses fluctuates throughout the day, and that not all of the required maximum parking spaces are occupied at any particular time. This technique also notes that the peak (or maximum) parking demands for different uses may occur at different times of the day. As indicated in Table 2-5 and 2-6 of Shared Parking and in Attachments H-2 and H-3, hotel visitors show their peak parking demand at approximately 11:00 PM. The restaurant, sundry shop, and hotel employees have a typical peak parking demand during the late morning and/or early afternoon period (between 10:00 AM to 4:00 PM). Ballroom and meeting room facilities and spa uses usually have peak parking demands between 5:00 PM and 10:00 PM. Therefore, the peak parking demands of the uses proposed for the project occurs during different times of the day, indicating the potential for effective "shared parking" demand reductions.

Other factors also affect the amount of parking utilized by a given project. Guests staying at the hotel/timeshare resort are also likely to use the support facilities. This "internal interaction" results in a reduction in the number of vehicles required to supply the necessary number of customers to a site. Additionally, some patrons or employees may utilize public transportation or other transit options, or may walk to the site from nearby residential or adjacent commercial developments. Each of these factors reduces the number of vehicles parked at the project site. For purposes of this analysis, an "internal use" factor of 50 percent was assumed for parking associated with the sundry shop, spa and the restaurant uses, and 25 percent was assumed for the ballroom and meeting room uses. A modest 10 percent "transit/carpool" factor was

assumed for the hotel/timeshare resort employees, and a 10 percent "walk-in" factor was assumed for the restaurant uses.

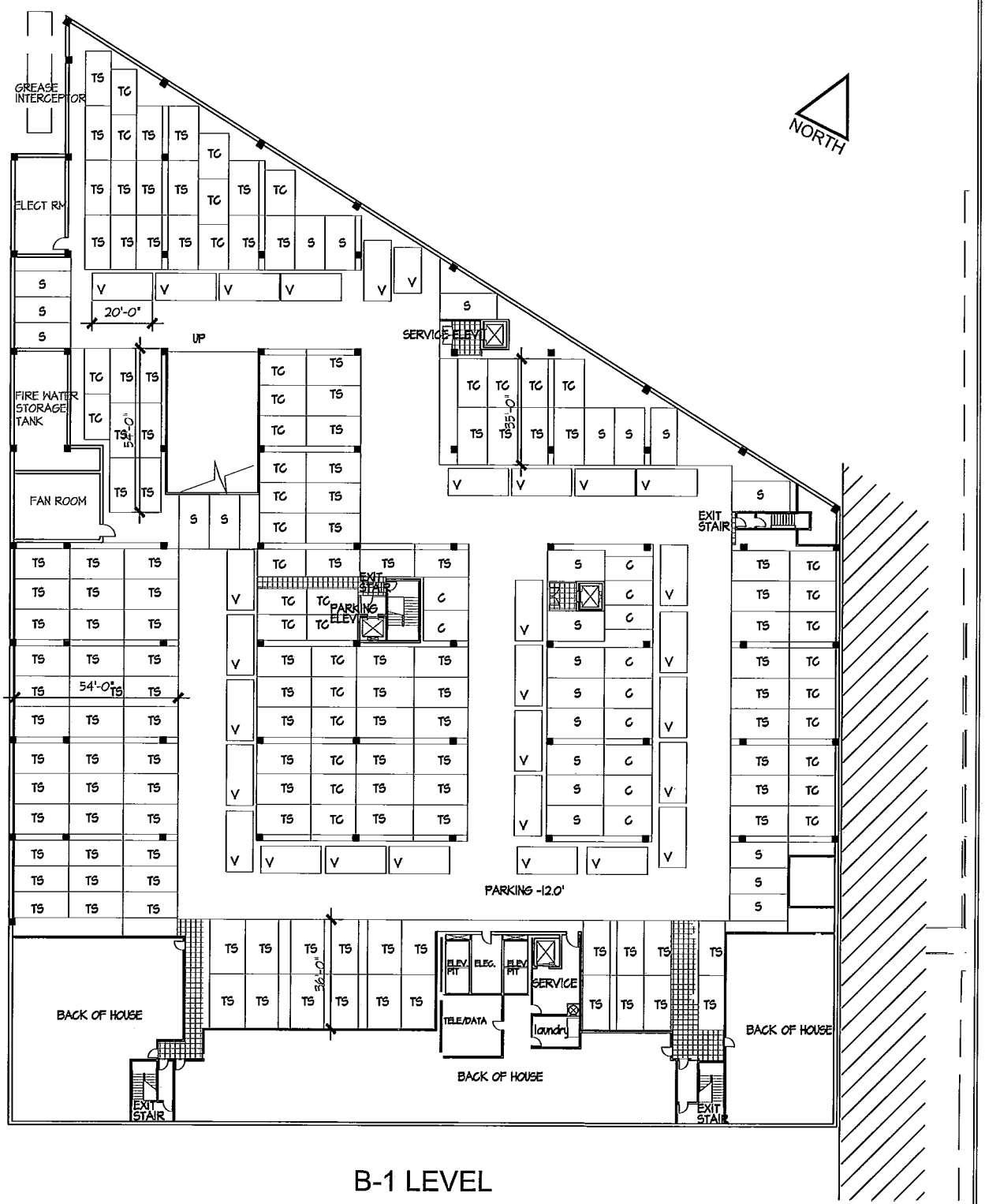
Finally, ULI recognizes that different land uses have different seasonal variations for utilization and associated parking demand. For example, hotels experience their maximum patronage during the summer months, with the winter periods experiencing a reduction in patronage relative to this peak activity. Land uses such as the sundry shop tend to experience their maximum patronage during the winter holiday months, with a reduction during the summer months. Restaurant uses also have maximum patronage during the peak holiday month, with a slight reduction during the summer months. Spa uses have patronage near maximum during the peak holiday month, with a reduction during the summer months. Some uses such as ballrooms and meeting rooms, and hotel employees do not show any significant seasonal variations.

The shared parking demands for the proposed project were then calculated in the following manner. First, the "internal-use", "transit/carpool" and "walk-in" reduction factors were applied to the baseline maximum parking demands for each of the project uses. Next, the seasonal variation factor was applied. Two calculations were performed: one for summer months (August – hotel guests at maximum), and one for winter months (December – sundry shop and restaurant uses at maximum, and spa use near maximum). As noted previously, ballroom and meeting room uses, and hotel employees do not show any significant seasonal variations. The ULI seasonal variation factors for the individual components of the project are found in Table 2-3 and 2-4 of the Shared Parking document, and summarized in Attachment H-2 for the peak summer month and Attachment H-3 for the peak winter month. These calculations resulted in the "adjusted" project parking demands. Note that these values reflect only adjustments for non-vehicular patronage, and for seasonal variation, and do not include application of the shared parking hourly accumulation percentage methodology.

These adjusted seasonal parking demands were then used to calculate the seasonal shared parking demands for the proposed hotel/timeshare resort. The hotel/timeshare resort visitor hourly parking accumulations (the number of vehicles parked at the site by guests of the hotel/timeshare resort by each hour of the day) were calculated by multiplying the adjusted seasonal parking demand for the hotel visitors by the ULI hourly accumulation percentages shown in Tables 2-5 and Table 2-6 of the Shared Parking document, and in Attachments H-2 and H-3. Shared parking demands for the other project uses were calculated in a similar manner.

In addition, ULI also recognizes that there are variations in parking demand on the weekdays versus the weekends. For example, the parking demand for the sundry shop is slightly lower on the weekdays as compared to the weekend demand. In contrast, the parking demand for the spa use is slightly lower on the weekends as compared to the weekday demand. The hotel/timeshare resort visitor and employee components and land uses such as ballrooms/meeting rooms and restaurants do not show any significant variations. These weekday/weekend factors were also applied to calculate the peak period parking demand.

As shown in the tables and parking accumulation curves in Attachments H-2 and H-3, the results of the shared parking calculations indicate that the maximum seasonal parking needs for the hotel/timeshare resort site would be approximately 345 spaces and is expected to occur between 9:00 PM and 10:00 PM on a typical summer weekend, with the summer weekday parking peak being slightly lower at 344 spaces. As noted previously and in Attachments H-2 and H-3, the hotel/timeshare resort will accommodate approximately 360 spaces, or a surplus of at least 15 spaces. Thus, no parking spillover onto area streets or into the nearby neighborhoods is anticipated, and no parking-related impacts are expected as a result of the proposed hotel/timeshare resort development on Parcel 9U.



B-1 LEVEL

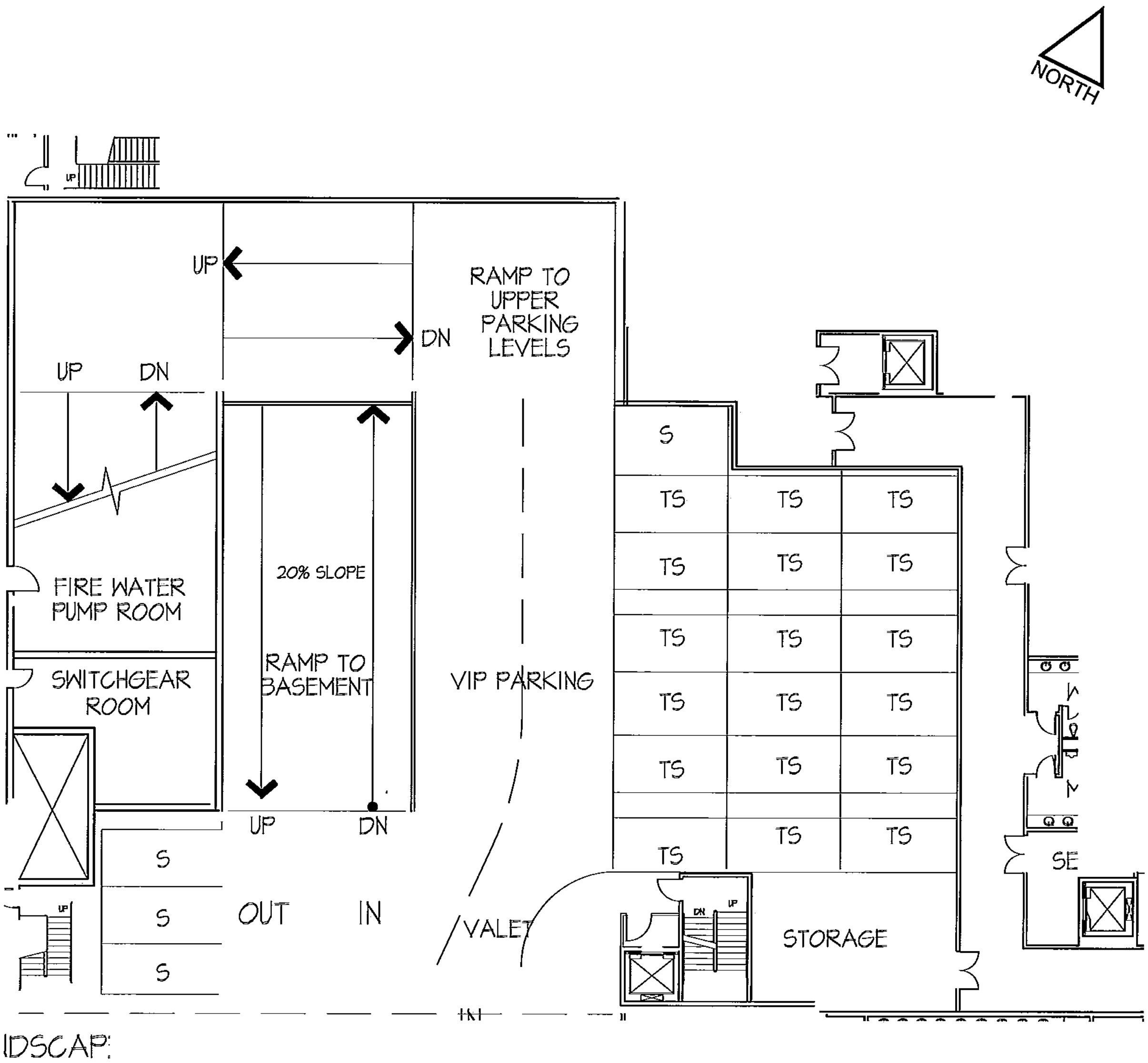
ATTACHMENT H-1

05/02/2007

FN: MARINA DEL REY LEGACY\REPORT(5-2007)\VALET PARKING LEVELS(B-1 LEVEL)

HOTEL PARKING LAYOUT

CRAIN & ASSOCIATES
Transportation Planning
Traffic Engineering
2007 Sawtelle Boulevard
Los Angeles California 90025
PH (310) 473 6508 F (310) 444 9771
www.crainandassociates.com



GROUND LEVEL

ATTACHMENT H-1

05/02/2007

FN: MARINA DEL REY LEGACY\REPORT(5-2007)\GROUND PARKING

HOTEL PARKING LAYOUT

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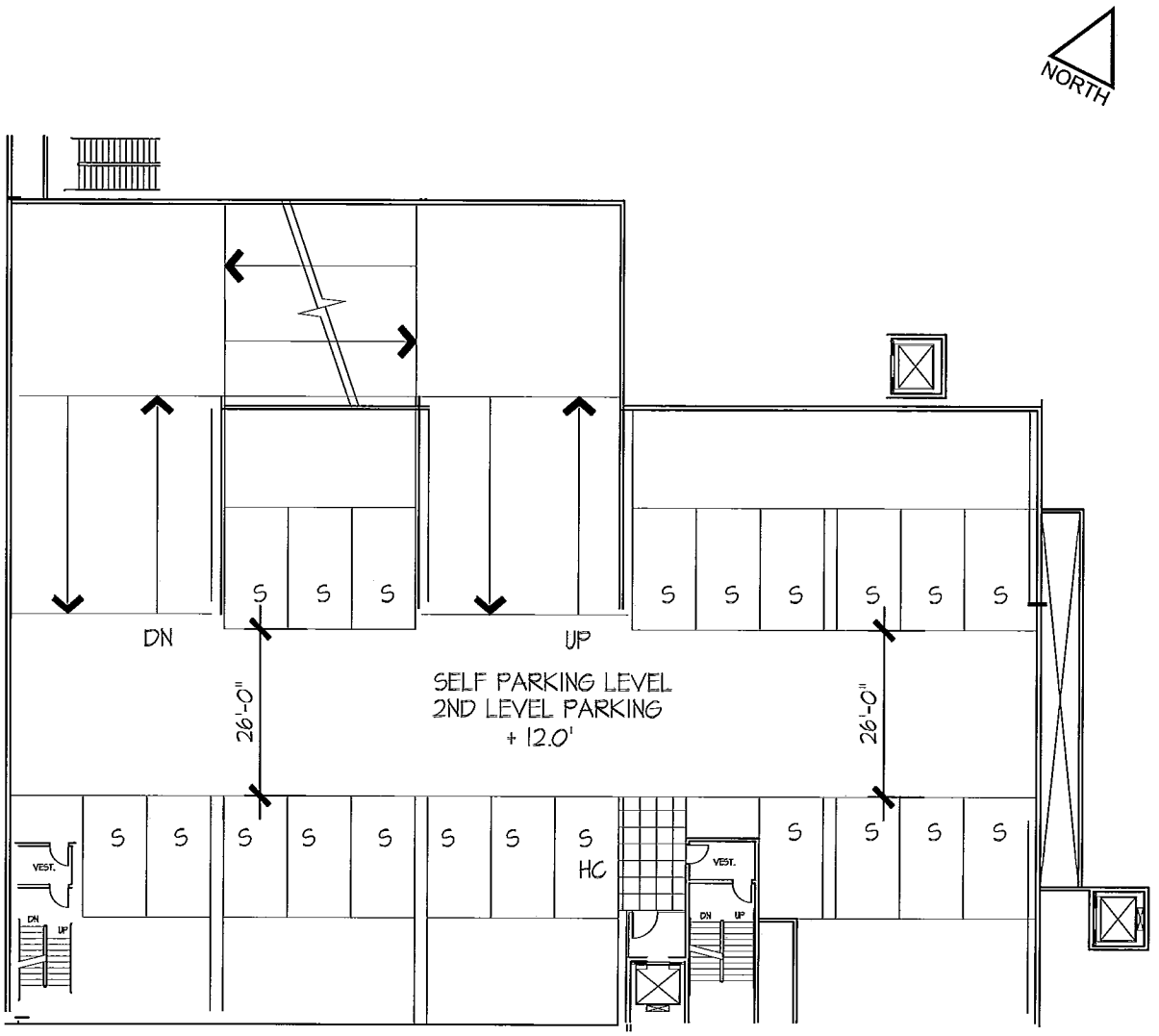

SECOND LEVEL

ATTACHMENT H-1

05/02/2007

FN: MARINA DEL REY LEGACY\REPORT(5-2007)\VALET PARKING LEVELS(2ND)

HOTEL PARKING LAYOUT

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Traffic Engineering
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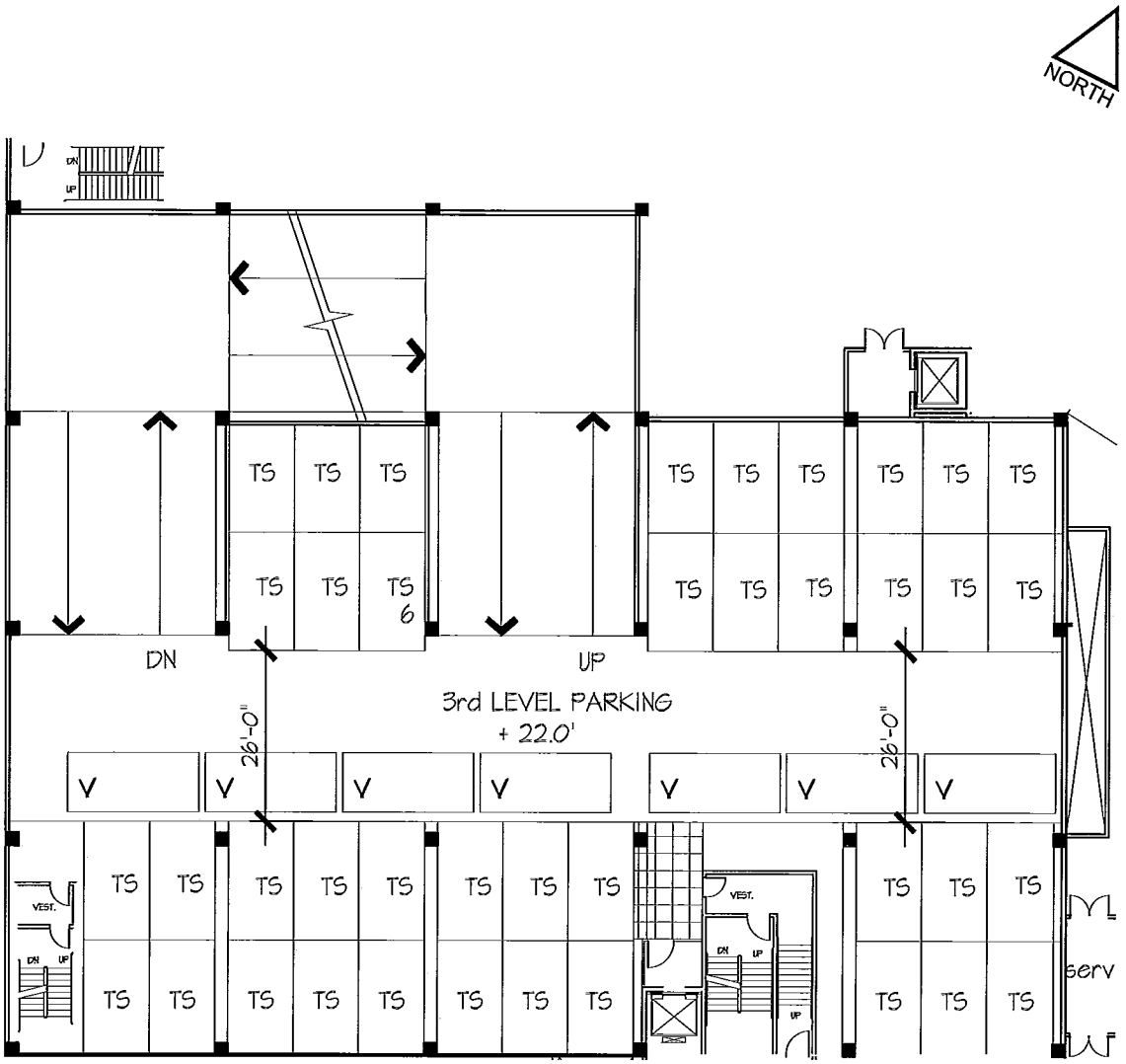

THIRD LEVEL

ATTACHMENT H-1

05/02/2007

FN: MARINA DEL REY LEGACY\REPORT(5-2007)\VALET PARKING LEVELS(3RD)

HOTEL PARKING LAYOUT

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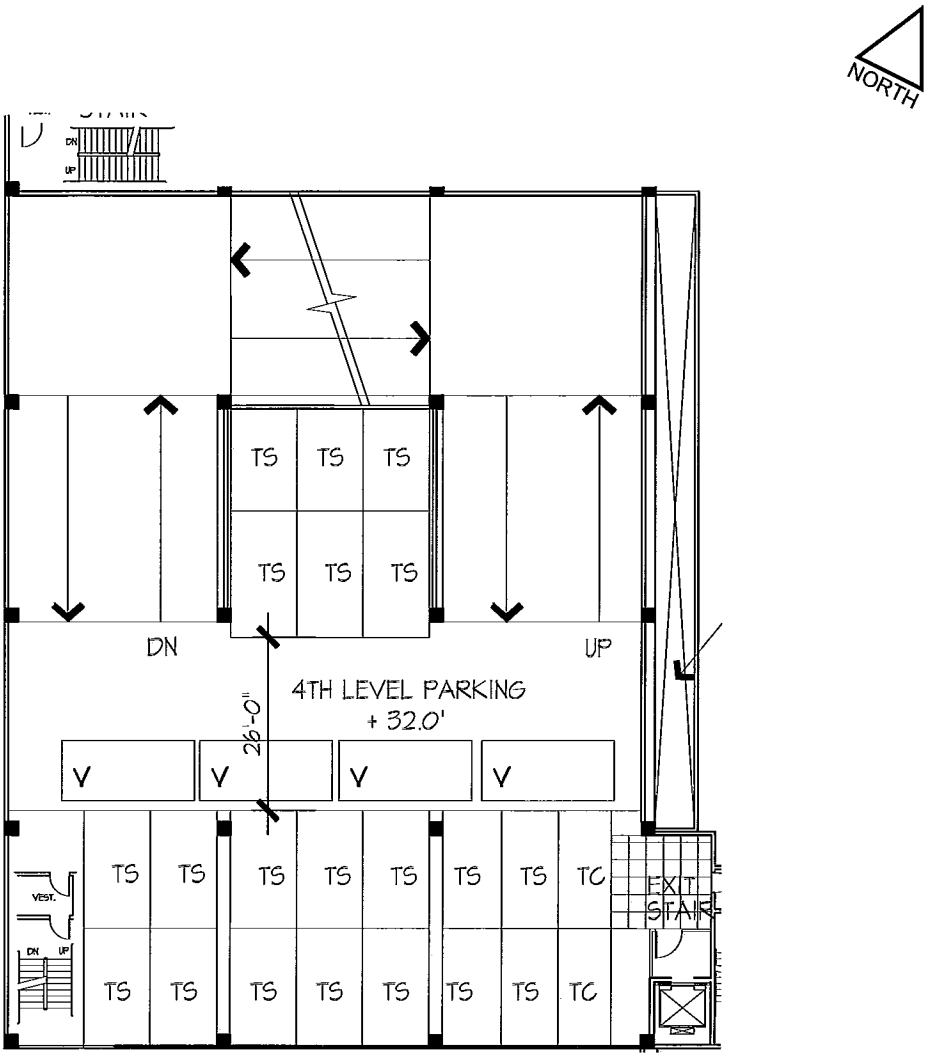

FOURTH LEVEL

ATTACHMENT H-1

05/02/2007

FN: MARINA DEL REY LEGACY\REPORT(5-2007)\VALET PARKING LEVELS(4TH)

HOTEL PARKING LAYOUT

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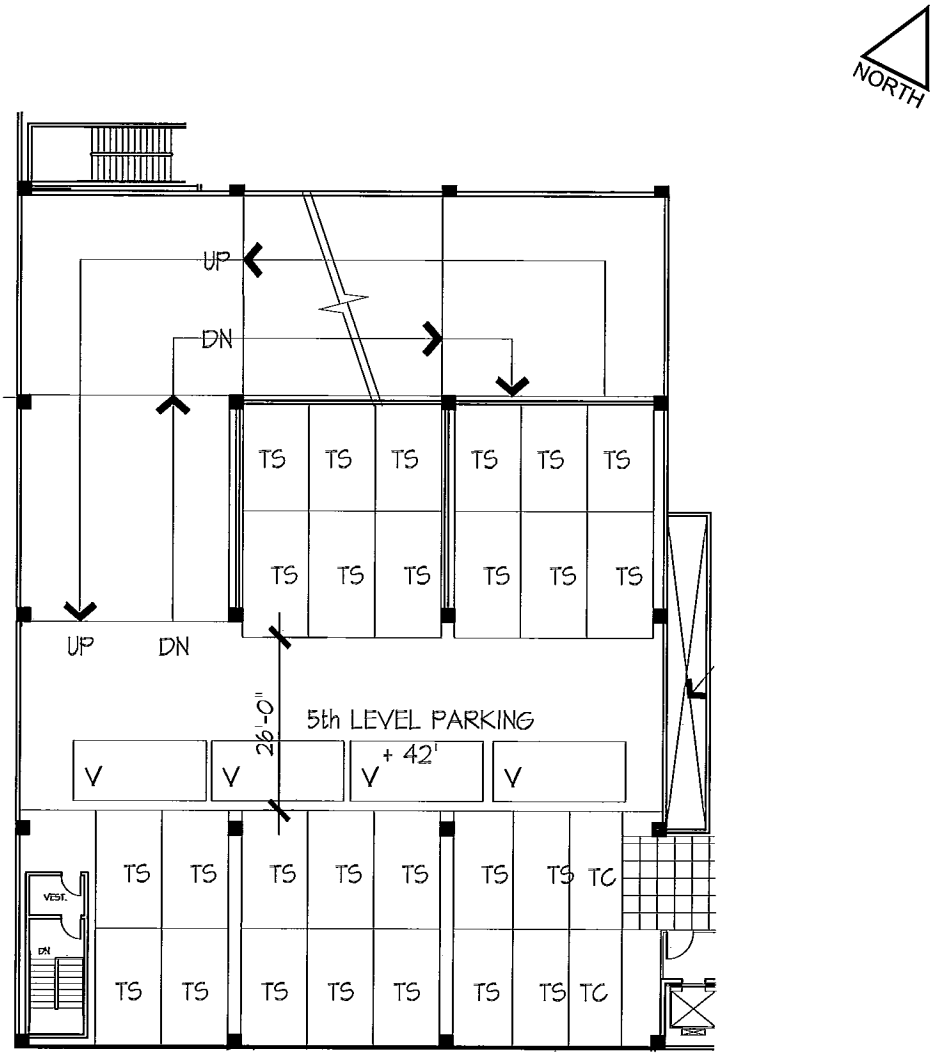

FIFTH LEVEL

ATTACHMENT H-1

05/02/2007

FN: MARINA DEL REY LEGACY\REPORT(5-2007)\VALET PARKING LEVELS(5TH)

HOTEL PARKING LAYOUT

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ATTACHMENT H-2
PROPOSED HOTEL PROJECT ON PARCEL 9U
SHARED PARKING DEMAND CALCULATIONS
AUGUST MAXIMUM PROJECT COMPONENT DEMANDS

DESCRIPTION	SIZE	PARKING RATE	STAND-ALONE SPACES REQ'D	INTERNAL USE FACTOR	TRANSIT/ CARPOOL FACTOR	"WALK-IN" FACTOR	AUGUST MONTHLY USE FACTOR	ADJUSTED MAXIMUM PARKING DEMANDS
PROPOSED PROJECT								
HOTEL								
Visitor	83 2-Bedroom	0.843 / 1 Unit	70	0%	0%	0%	100%	70
	205 1-Bedroom	0.424 / 1 Unit	87	0%	0%	0%	100%	87
Employee		0.097 / 1 Unit	28	0%	10%	0%	100%	25
SUNDRY SHOP	1,176 SF	4 / 1 KSF	5	50%	0%	0%	69%	2
SPA	5,555 SF	1 / 3 Occupant	37	50%	0%	0%	70%	13
BALLROOM	5,200 SF	1 / 3 Occupant	116	25%	0%	0%	100%	87
MEETING ROOM	3,400 SF	1 / 3 Occupant	76	25%	0%	0%	100%	57
RESTAURANT								
Customer Seating Area	3,140 SF							
Outdoor Dining	1,840 SF							
Bar Lounge	1,125 SF							
Subtotal	6,105 SF	1 / 3 Occupant	136	50%	0%	10%	99%	54
PROJECT TOTAL:			555					395

* Based on one occupant per 50 sf for spa use, and one occupant per 15 sf for ballroom, meeting room & restaurant uses.
Note: The sum of the Adjusted Parking Demand numbers assumes that the parking demands of all uses peak at the same time, and does not account for variations in demand for the different uses during the course of a day. These variations are reflected in the attached tables and parking accumulation curves.

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ATTACHMENT H-2
PROPOSED HOTEL PROJECT ON PARCEL 9U
SHARED PARKING DEMAND CALCULATIONS
AUGUST MAXIMUM PROJECT COMPONENT DEMANDS

WEEKDAY
PARKING ACCUMULATION PERCENTAGES

TIME OF DAY	Hotel Visitor	Hotel Employee	Sundry Shop	Spa	Ballroom/ Meeting Room	Restaurant
6:00AM	95%	5%	1%	70%	0%	0%
7:00	95%	30%	5%	40%	0%	10%
8:00	90%	90%	15%	40%	30%	30%
9:00	80%	90%	35%	70%	60%	10%
10:00	70%	100%	65%	70%	60%	10%
11:00	70%	100%	85%	80%	60%	5%
12:00N	65%	100%	95%	60%	65%	100%
1:00PM	65%	100%	100%	70%	65%	100%
2:00	70%	100%	95%	70%	65%	33%
3:00	70%	100%	90%	70%	65%	10%
4:00	75%	90%	90%	80%	65%	10%
5:00	80%	70%	95%	90%	100%	30%
6:00	85%	40%	95%	100%	100%	55%
7:00	85%	20%	95%	90%	100%	60%
8:00	90%	20%	80%	80%	100%	70%
9:00	95%	20%	50%	70%	100%	67%
10:00	95%	20%	30%	35%	50%	60%
11:00	100%	10%	10%	10%	0%	40%
12:00M	100%	5%	0%	0%	0%	30%
Weekday Peak Demand/Rate	100%	100%	91%	100%	100%	100%

WEEKEND
PARKING ACCUMULATION PERCENTAGES

TIME OF DAY	Hotel Visitor	Hotel Employee	Sundry Shop	Spa	Ballroom/ Meeting Room	Restaurant
6:00AM	95%	5%	1%	80%	0%	0%
7:00	95%	30%	5%	45%	0%	10%
8:00	90%	90%	10%	35%	30%	30%
9:00	80%	90%	30%	50%	60%	10%
10:00	70%	100%	50%	35%	60%	10%
11:00	70%	100%	65%	50%	60%	5%
12:00N	65%	100%	80%	50%	65%	100%
1:00PM	65%	100%	90%	30%	65%	100%
2:00	70%	100%	100%	25%	65%	33%
3:00	70%	100%	100%	30%	65%	10%
4:00	75%	90%	95%	55%	65%	10%
5:00	80%	75%	90%	100%	100%	30%
6:00	85%	60%	80%	95%	100%	55%
7:00	85%	55%	75%	60%	100%	60%
8:00	90%	55%	65%	30%	100%	70%
9:00	95%	55%	50%	10%	100%	67%
10:00	95%	45%	35%	1%	50%	60%
11:00	100%	45%	15%	1%	0%	40%
12:00M	100%	30%	0%	0%	0%	30%
Weekend Peak Demand/Rate	100%	100%	100%	83%	100%	100%

Source: Tables 2-5 and 2-6 from Urban Land Institute Shared Parking, 2nd Edition, 2005.

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ATTACHMENT H-2
PROPOSED HOTEL PROJECT ON PARCEL 9U
SHARED PARKING DEMAND CALCULATIONS
AUGUST MAXIMUM PROJECT COMPONENT DEMANDS

WEEKDAY "TOTAL SITE" PARKING ACCUMULATIONS

TIME OF DAY	HOTEL VISITOR	HOTEL EMPLOYEE	SUNDRY SHOP	SPA	BALLROOM	MEETING ROOM	RESTAURANT	TOTAL SHARED PARKING DEMAND	PARKING CAPACITY	PARKING SURPLUS/ (DEFICIT)
6:00 AM	149	1	0	9	0	0	0	**159**	360	
7:00	149	8	0	5	0	0	5	**167**	360	
8:00	141	23	0	5	26	17	16	**228**	360	
9:00	126	23	1	9	52	34	5	**250**	360	
10:00	110	25	1	9	52	34	5	**236**	360	
11:00	110	25	2	10	52	34	3	**236**	360	
12:00 Noon	102	25	2	8	57	37	54	**285**	360	
1:00 PM	102	25	2	9	57	37	54	**286**	360	
2:00	110	25	2	9	57	37	18	**258**	360	
3:00	110	25	2	9	57	37	5	**245**	360	
4:00	118	23	2	10	57	37	5	**252**	360	
5:00	126	18	2	12	87	57	16	**318**	360	
6:00	133	10	2	13	87	57	30	**332**	360	
7:00	133	5	2	12	87	57	32	**328**	360	
8:00	141	5	1	10	87	57	38	**339**	360	
9:00	149	5	1	9	87	57	36	**344** *	360	16
10:00	149	5	1	5	44	29	32	**265**	360	
11:00	157	3	0	1	0	0	22	**183**	360	
12:00 Mid	157	1	0	0	0	0	16	**174**	360	

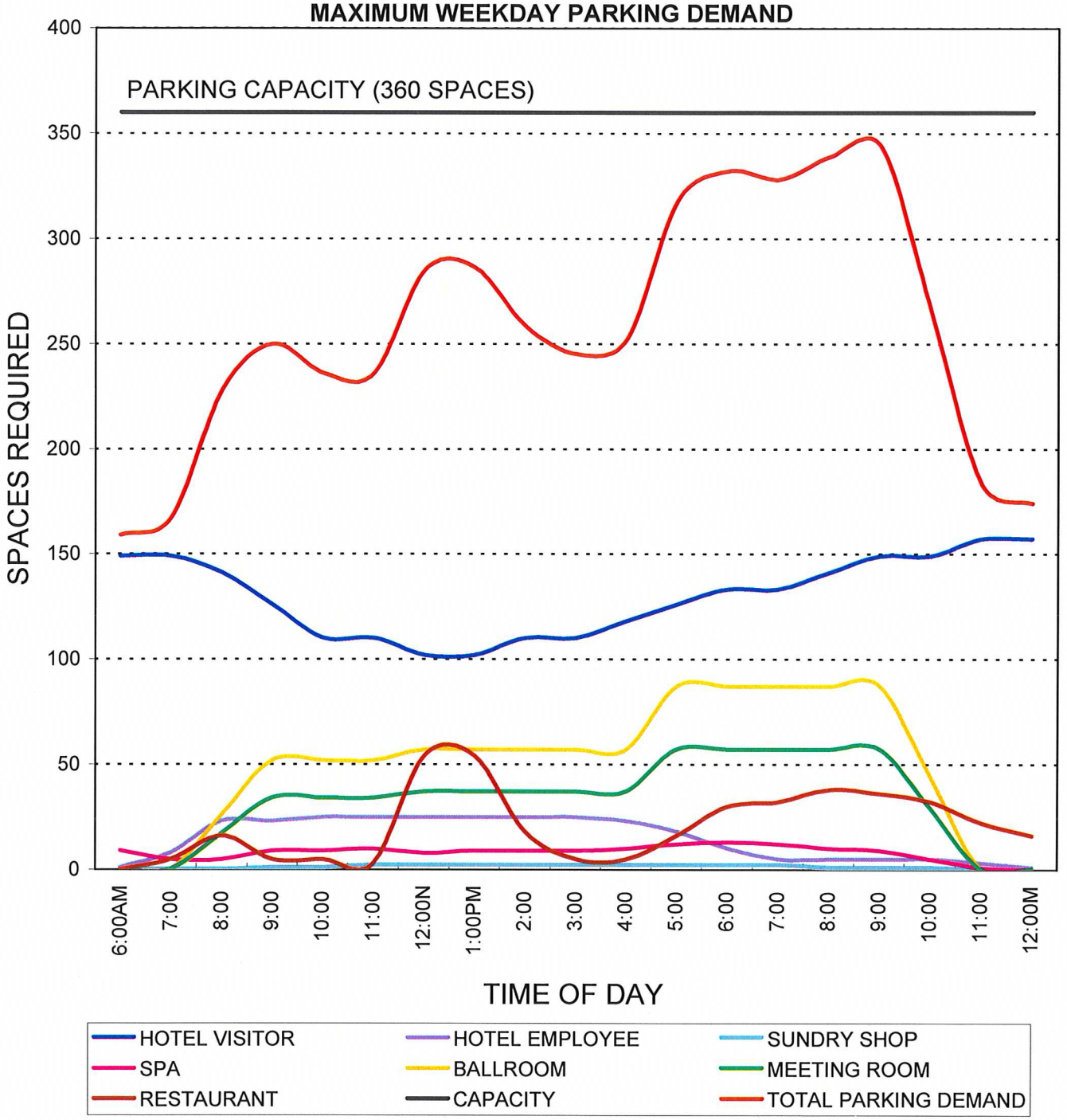
WEEKEND "TOTAL SITE" PARKING ACCUMULATIONS

TIME OF DAY	HOTEL VISITOR	HOTEL EMPLOYEE	SUNDRY SHOP	SPA	BALLROOM	MEETING ROOM	RESTAURANT	TOTAL SHARED PARKING DEMAND	PARKING CAPACITY	PARKING SURPLUS/ (DEFICIT)
6:00 AM	149	1	0	9	0	0	0	**159**	360	
7:00	149	8	0	5	0	0	5	**167**	360	
8:00	141	23	0	4	26	17	16	**227**	360	
9:00	126	23	1	5	52	34	5	**246**	360	
10:00	110	25	1	4	52	34	5	**231**	360	
11:00	110	25	1	5	52	34	3	**230**	360	
12:00 Noon	102	25	2	5	57	37	54	**282**	360	
1:00 PM	102	25	2	3	57	37	54	**280**	360	
2:00	110	25	2	3	57	37	18	**252**	360	
3:00	110	25	2	3	57	37	5	**239**	360	
4:00	118	23	2	6	57	37	5	**248**	360	
5:00	126	19	2	11	87	57	16	**318**	360	
6:00	133	15	2	10	87	57	30	**334**	360	
7:00	133	14	2	7	87	57	32	**332**	360	
8:00	141	14	1	3	87	57	38	**341**	360	
9:00	149	14	1	1	87	57	36	**345** *	360	15
10:00	149	11	1	0	44	29	32	**266**	360	
11:00	157	11	0	0	0	0	22	**190**	360	
12:00 Mid	157	8	0	0	0	0	16	**181**	360	

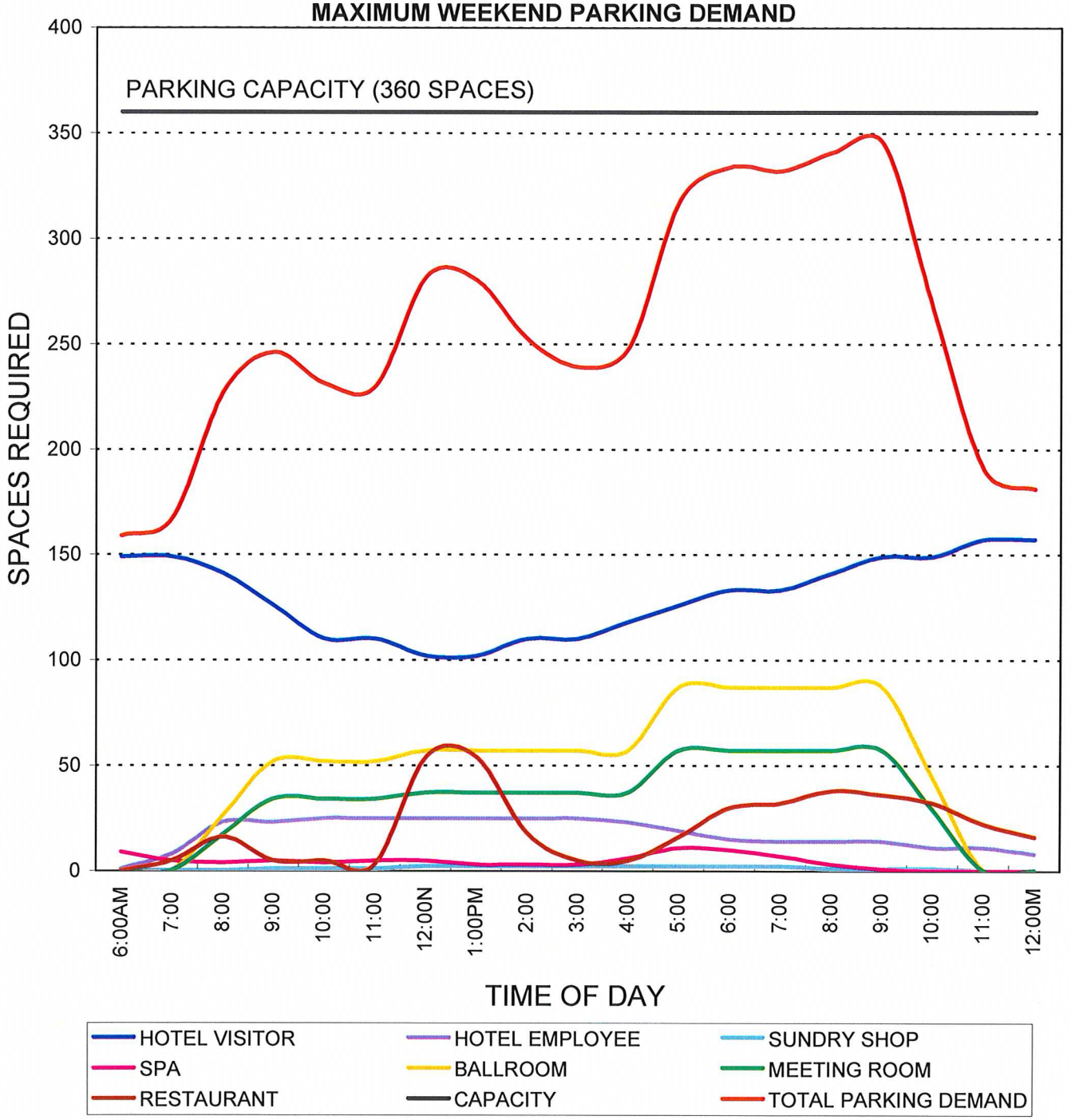
* Peak parking demand.

Note: Urban Land Institute parking accumulation percentages applied to determine hourly demand for each use.
The proposed hotel will accommodate a total of 360 spaces (21 self-park spaces on the second parking level and 339 valet spaces located on all other parking levels).

ATTACHMENT H-2
PEAK SUMMER MONTH - AUGUST
MAXIMUM WEEKDAY PARKING DEMAND



ATTACHMENT H-2
PEAK SUMMER MONTH - AUGUST
MAXIMUM WEEKEND PARKING DEMAND



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ATTACHMENT H-3
PROPOSED HOTEL PROJECT ON PARCEL 9L
SHARED PARKING DEMAND CALCULATIONS
DECEMBER MAXIMUM PROJECT COMPONENT DEMANDS

DESCRIPTION	SIZE	PARKING RATE	STAND-ALONE SPACES REQ'D	INTERNAL USE FACTOR	TRANSIT/ CARPOOL FACTOR	"WALK-IN" FACTOR	DECEMBER MONTHLY USE FACTOR	ADJUSTED MAXIMUM PARKING DEMANDS
PROPOSED PROJECT								
HOTEL								
Visitor	83 2-Bedroom	0.843 / 1 Unit	70	0%	0%	0%	50%	35
	205 1-Bedroom	0.424 / 1 Unit	87	0%	0%	0%	50%	44
Employee		0.097 / 1 Unit	28	0%	10%	0%	100%	25
SUNDRY SHOP	1,176 SF	4 / 1 KSF	5	50%	0%	0%	100%	3
SPA	5,555 SF	1 / 3 Occupant	37	50%	0%	0%	90%	17
BALLROOM	5,200 SF	1 / 3 Occupant	116	25%	0%	0%	100%	87
MEETING ROOM	3,400 SF	1 / 3 Occupant	76	25%	0%	0%	100%	57
RESTAURANT								
Customer Seating Area	3,140 SF							
Outdoor Dining	1,840 SF							
Bar Lounge	1,125 SF							
Subtotal	6,105 SF	1 / 3 Occupant	136	50%	0%	10%	100%	54
PROJECT TOTAL:			555					322

* Based on one occupant per 50 sf for spa use, and one occupant per 15 sf for ballroom, meeting room & restaurant uses.

Note: The sum of the Adjusted Parking Demand numbers assumes that the parking demands of all uses peak at the same time, and does not account for variations in demand for the different uses during the course of a day. These variations are reflected in the attached tables and parking accumulation curves.

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ATTACHMENT H-3
PROPOSED HOTEL PROJECT ON PARCEL 9U
SHARED PARKING DEMAND CALCULATIONS
DECEMBER MAXIMUM PROJECT COMPONENT DEMANDS

WEEKDAY
PARKING ACCUMULATION PERCENTAGES

TIME OF DAY	Hotel Visitor	Hotel Employee	Sundry Shop	Spa	Ballroom/ Meeting Room	Restaurant
6:00AM	95%	5%	1%	70%	0%	0%
7:00	95%	30%	5%	40%	0%	10%
8:00	90%	90%	15%	40%	30%	30%
9:00	80%	90%	30%	70%	60%	10%
10:00	70%	100%	55%	70%	60%	10%
11:00	70%	100%	75%	80%	60%	5%
12:00N	65%	100%	90%	60%	65%	100%
1:00PM	65%	100%	100%	70%	65%	100%
2:00	70%	100%	100%	70%	65%	33%
3:00	70%	100%	100%	70%	65%	10%
4:00	75%	90%	95%	80%	65%	10%
5:00	80%	70%	85%	90%	100%	30%
6:00	85%	40%	80%	100%	100%	55%
7:00	85%	20%	75%	90%	100%	60%
8:00	90%	20%	65%	80%	100%	70%
9:00	95%	20%	50%	70%	100%	67%
10:00	95%	20%	30%	35%	50%	60%
11:00	100%	10%	10%	10%	0%	40%
12:00M	100%	5%	0%	0%	0%	30%
Weekday Peak Demand/Rate	100%	100%	91%	100%	100%	100%

WEEKEND
PARKING ACCUMULATION PERCENTAGES

TIME OF DAY	Hotel Visitor	Hotel Employee	Sundry Shop	Spa	Ballroom/ Meeting Room	Restaurant
6:00AM	95%	5%	1%	80%	0%	0%
7:00	95%	30%	5%	45%	0%	10%
8:00	90%	90%	10%	35%	30%	30%
9:00	80%	90%	35%	50%	60%	10%
10:00	70%	100%	60%	35%	60%	10%
11:00	70%	100%	70%	50%	60%	5%
12:00N	65%	100%	85%	50%	65%	100%
1:00PM	65%	100%	95%	30%	65%	100%
2:00	70%	100%	100%	25%	65%	33%
3:00	70%	100%	100%	30%	65%	10%
4:00	75%	90%	95%	55%	65%	10%
5:00	80%	75%	90%	100%	100%	30%
6:00	85%	60%	80%	95%	100%	55%
7:00	85%	55%	75%	60%	100%	60%
8:00	90%	55%	65%	30%	100%	70%
9:00	95%	55%	50%	10%	100%	67%
10:00	95%	45%	35%	1%	50%	60%
11:00	100%	45%	15%	1%	0%	40%
12:00M	100%	30%	0%	0%	0%	30%
Weekend Peak Demand/Rate	100%	100%	100%	83%	100%	100%

Source: Tables 2-5 and 2-6 from Urban Land Institute Shared Parking, 2nd Edition, 2005.

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ATTACHMENT H-3
PROPOSED HOTEL PROJECT ON PARCEL 9U
SHARED PARKING DEMAND CALCULATIONS
DECEMBER MAXIMUM PROJECT COMPONENT DEMANDS

WEEKDAY "TOTAL SITE" PARKING ACCUMULATIONS

TIME OF DAY	HOTEL VISITOR	HOTEL EMPLOYEE	SUNDRY SHOP	SPA	BALLROOM	MEETING ROOM	RESTAURANT	**TOTAL SHARED PARKING DEMAND**	PARKING CAPACITY	PARKING SURPLUS/ (DEFICIT)
6:00 AM	75	1	0	12	0	0	0	**88**	360	
7:00	75	8	0	7	0	0	5	**95**	360	
8:00	71	23	0	7	26	17	16	**160**	360	
9:00	63	23	1	12	52	34	5	**190**	360	
10:00	55	25	1	12	52	34	5	**184**	360	
11:00	55	25	2	14	52	34	3	**185**	360	
12:00 Noon	51	25	2	10	57	37	54	**236**	360	
1:00 PM	51	25	3	12	57	37	54	**239**	360	
2:00	55	25	3	12	57	37	18	**207**	360	
3:00	55	25	3	12	57	37	5	**194**	360	
4:00	59	23	3	14	57	37	5	**198**	360	
5:00	63	18	2	15	87	57	16	**258**	360	
6:00	67	10	2	17	87	57	30	**270**	360	
7:00	67	5	2	15	87	57	32	**265**	360	
8:00	71	5	2	14	87	57	38	**274** *	360	86
9:00	75	5	1	12	87	57	36	**273**	360	
10:00	75	5	1	6	44	29	32	**192**	360	
11:00	79	3	0	2	0	0	22	**106**	360	
12:00 Mid	79	1	0	0	0	0	16	**96**	360	

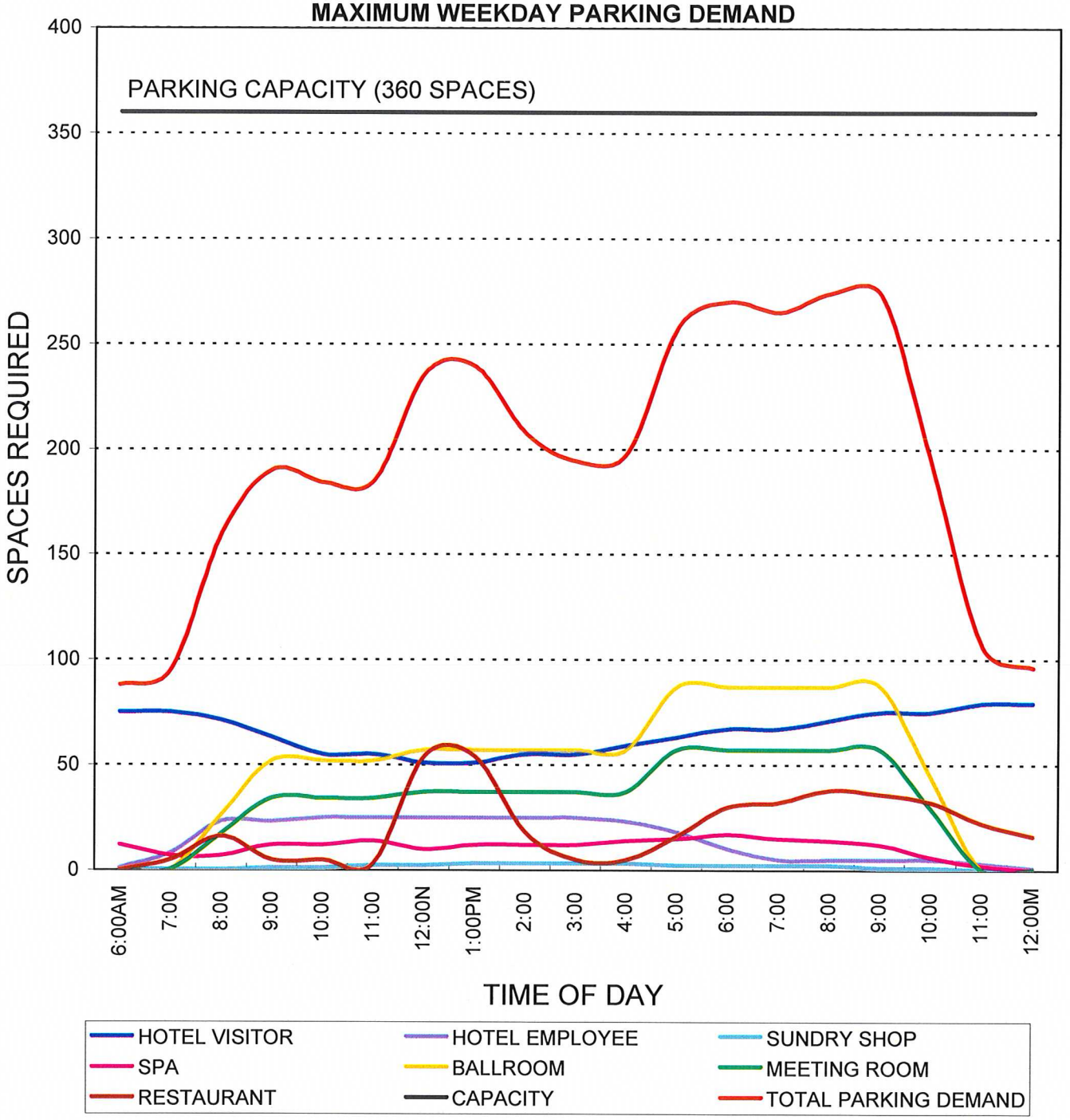
WEEKEND "TOTAL SITE" PARKING ACCUMULATIONS

TIME OF DAY	HOTEL VISITOR	HOTEL EMPLOYEE	SUNDRY SHOP	SPA	BALLROOM	MEETING ROOM	RESTAURANT	**TOTAL SHARED PARKING DEMAND**	PARKING CAPACITY	PARKING SURPLUS/ (DEFICIT)
6:00 AM	75	1	0	11	0	0	0	**87**	360	
7:00	75	8	0	6	0	0	5	**94**	360	
8:00	71	23	0	5	26	17	16	**158**	360	
9:00	63	23	1	7	52	34	5	**185**	360	
10:00	55	25	2	5	52	34	5	**178**	360	
11:00	55	25	2	7	52	34	3	**178**	360	
12:00 Noon	51	25	3	7	57	37	54	**234**	360	
1:00 PM	51	25	3	4	57	37	54	**231**	360	
2:00	55	25	3	4	57	37	18	**199**	360	
3:00	55	25	3	4	57	37	5	**186**	360	
4:00	59	23	3	8	57	37	5	**192**	360	
5:00	63	19	3	14	87	57	16	**259**	360	
6:00	67	15	2	13	87	57	30	**271**	360	
7:00	67	14	2	9	87	57	32	**268**	360	
8:00	71	14	2	4	87	57	38	**273** *	360	87
9:00	75	14	2	1	87	57	36	**272**	360	
10:00	75	11	1	0	44	29	32	**192**	360	
11:00	79	11	0	0	0	0	22	**112**	360	
12:00 Mid	79	8	0	0	0	0	16	**103**	360	

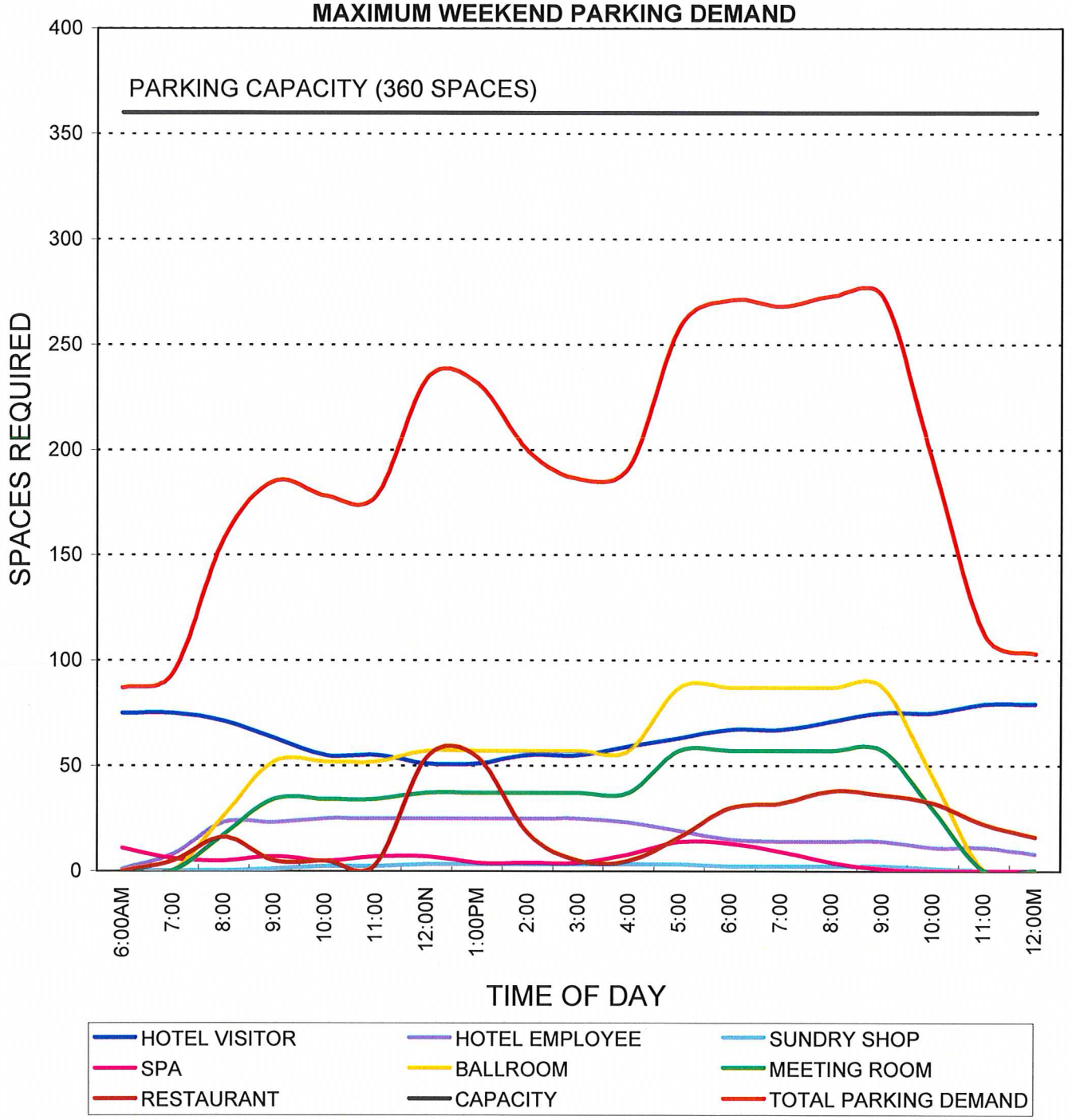
* Peak parking demanc

Note: Urban Land Institute parking accumulation percentages applied to determine hourly demand for each use.
The proposed hotel will accommodate a total of 360 spaces (21 self-park spaces on the second parking level and 339 valet spaces located on all other parking levels).

ATTACHMENT H-3
PEAK WINTER MONTH - DECEMBER
MAXIMUM WEEKDAY PARKING DEMAND



ATTACHMENT H-3
PEAK WINTER MONTH - DECEMBER
MAXIMUM WEEKEND PARKING DEMAND



APPENDIX I

CRITICAL MOVEMENT ANALYSIS CALCULATION WORKSHEETS

(UNDER SEPARATE COVER)

DRAFT

TRAFFIC ANALYSIS FOR A PROPOSED 526-UNIT RESIDENTIAL DEVELOPMENT, 288-UNIT HOTEL/TIMESHARE RESORT, AND 1.46-ACRE PUBLIC PARK ON PARCELS 10R, FF AND 9U IN MARINA DEL REY

APPENDIX I
CRITICAL MOVEMENT ANALYSIS CALCULATION WORKSHEETS

Prepared for:

LEGACY PARTNERS NEPTUNE MARINA, LLC
AND WOODFIN SUITES HOTEL, LLC

Prepared by:

Crain & Associates
2007 Sawtelle Boulevard, Suite 4
Los Angeles, California 90025
(310) 473-6508

December 2007

Existing (2007)

CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	18	0	153	61
EASTBOUND	74	2	0	0
NORTHBOUND	5	889	15	0
SOUTHBOUND	122	337	23	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	18	N/A	N/A	153	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	76
NORTHBOUND	5	N/A	301	301	N/A	N/A
SOUTHBOUND	122	N/A	120	120	N/A	N/A

EAST-WEST CRITICAL VOLUMES 227
NORTH-SOUTH CRITICAL VOLUMES 423

THE SUM OF CRITICAL VOLUMES 650

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.347

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	347	0	836	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	564	0	636
SOUTHBOUND	441	158	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	191	N/A	N/A	N/A	418	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	282	N/A	0	N/A
SOUTHBOUND	441	N/A	53	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 418
NORTH-SOUTH CRITICAL VOLUMES 723

THE SUM OF CRITICAL VOLUMES 1141

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.701

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	119	394	0	32
EASTBOUND	63	558	0	261
NORTHBOUND	500	527	280	60
SOUTHBOUND	56	226	9	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	119	N/A	197	N/A	0	N/A
EASTBOUND	63	N/A	279	N/A	0	N/A
NORTHBOUND	275	N/A	527	N/A	280	N/A
SOUTHBOUND	56	N/A	N/A	235	N/A	N/A

EAST-WEST CRITICAL VOLUMES 398
NORTH-SOUTH CRITICAL VOLUMES 762

THE SUM OF CRITICAL VOLUMES 1160

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.714

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	41	814	80	0
EASTBOUND	99	906	6	0
NORTHBOUND	41	78	59	0
SOUTHBOUND	151	27	28	50

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	41	N/A	447	447	N/A	N/A
EASTBOUND	99	N/A	456	456	N/A	N/A
NORTHBOUND	N/A	89	N/A	89	N/A	N/A
SOUTHBOUND	151	N/A	27	N/A	28	N/A

EAST-WEST CRITICAL VOLUMES 546
NORTH-SOUTH CRITICAL VOLUMES 240

THE SUM OF CRITICAL VOLUMES 786

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.424

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	124	908	0	0
EASTBOUND	0	948	0	79
NORTHBOUND	0	0	174	62
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	124	N/A	454	N/A	N/A	N/A
EASTBOUND	N/A	N/A	474	N/A	0	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	174	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 598
NORTH-SOUTH CRITICAL VOLUMES 174

THE SUM OF CRITICAL VOLUMES 772

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.643

LEVEL OF SERVICE ..... B

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	174	524	51	140
EASTBOUND	164	725	201	228
NORTHBOUND	414	1440	235	0
SOUTHBOUND	255	1383	167	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	96	N/A	262	N/A	51	N/A
EASTBOUND	90	N/A	362	N/A	201	N/A
NORTHBOUND	228	N/A	558	558	N/A	N/A
SOUTHBOUND	140	N/A	517	517	N/A	N/A

EAST-WEST CRITICAL VOLUMES 458
NORTH-SOUTH CRITICAL VOLUMES 745

THE SUM OF CRITICAL VOLUMES 1203

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.775

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	141	0	0	751
EASTBOUND	0	0	0	0
NORTHBOUND	0	1805	120	0
SOUTHBOUND	710	1247	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	78	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	642	642	N/A	N/A
SOUTHBOUND	390	N/A	416	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 78
NORTH-SOUTH CRITICAL VOLUMES 1032

THE SUM OF CRITICAL VOLUMES 1110

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.679

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	8	7	36	0
EASTBOUND	241	1	0	43
NORTHBOUND	160	2492	9	0
SOUTHBOUND	26	1281	156	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	51
EASTBOUND	121	121	N/A	N/A	0	N/A
NORTHBOUND	160	N/A	834	834	N/A	N/A
SOUTHBOUND	26	N/A	479	479	N/A	N/A

EAST-WEST CRITICAL VOLUMES 172
NORTH-SOUTH CRITICAL VOLUMES 860

THE SUM OF CRITICAL VOLUMES 1032

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.651

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	223	385	60	0
EASTBOUND	0	396	40	0
NORTHBOUND	150	1888	308	0
SOUTHBOUND	60	1105	42	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	123	N/A	222	222	N/A	N/A
EASTBOUND	N/A	N/A	218	218	N/A	N/A
NORTHBOUND	150	N/A	732	732	N/A	N/A
SOUTHBOUND	60	N/A	382	382	N/A	N/A

EAST-WEST CRITICAL VOLUMES 341
NORTH-SOUTH CRITICAL VOLUMES 792

THE SUM OF CRITICAL VOLUMES 1133

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.724

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	14	22	22	0
EASTBOUND	72	17	0	620
NORTHBOUND	768	2162	32	0
SOUTHBOUND	43	1331	38	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	29	N/A	29	N/A	N/A
EASTBOUND	72	N/A	17	N/A	0	N/A
NORTHBOUND	422	N/A	731	731	N/A	N/A
SOUTHBOUND	43	N/A	456	456	N/A	N/A

EAST-WEST CRITICAL VOLUMES 101
NORTH-SOUTH CRITICAL VOLUMES 878

THE SUM OF CRITICAL VOLUMES 979

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.587

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	55	28	146	165
EASTBOUND	18	35	23	0
NORTHBOUND	27	952	100	0
SOUTHBOUND	165	1295	19	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	55	N/A	N/A	87	87	N/A
EASTBOUND	N/A	38	N/A	38	N/A	N/A
NORTHBOUND	27	N/A	526	526	N/A	N/A
SOUTHBOUND	165	N/A	657	657	N/A	N/A

EAST-WEST CRITICAL VOLUMES 105
NORTH-SOUTH CRITICAL VOLUMES 691

THE SUM OF CRITICAL VOLUMES 796

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.459

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	121	16	259	140
EASTBOUND	21	35	24	0
NORTHBOUND	15	813	64	0
SOUTHBOUND	279	779	15	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	68	68	N/A	N/A	259	N/A
EASTBOUND	21	N/A	N/A	59	N/A	N/A
NORTHBOUND	15	N/A	438	438	N/A	N/A
SOUTHBOUND	279	N/A	397	397	N/A	N/A

EAST-WEST CRITICAL VOLUMES 318
NORTH-SOUTH CRITICAL VOLUMES 717

THE SUM OF CRITICAL VOLUMES 1035

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.626

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	86	0	717
EASTBOUND	87	104	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	560	0	0	70

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	86	N/A	0	N/A
EASTBOUND	87	N/A	52	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	308	N/A	N/A	N/A	0	N/A

EAST-WEST CRITICAL VOLUMES 173
NORTH-SOUTH CRITICAL VOLUMES 308

THE SUM OF CRITICAL VOLUMES 481

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.257

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	630	25	0
EASTBOUND	11	397	0	0
NORTHBOUND	365	760	202	70
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	328	328	N/A	N/A
EASTBOUND	11	N/A	198	N/A	N/A	N/A
NORTHBOUND	365	N/A	380	N/A	202	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 339
NORTH-SOUTH CRITICAL VOLUMES 380

THE SUM OF CRITICAL VOLUMES 719

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.405

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	268	727	0	0
EASTBOUND	0	386	522	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	23	884	12	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	268	N/A	364	N/A	N/A	N/A
EASTBOUND	N/A	N/A	303	303	303	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	23	N/A	448	448	N/A	N/A

EAST-WEST CRITICAL VOLUMES 571
NORTH-SOUTH CRITICAL VOLUMES 448

THE SUM OF CRITICAL VOLUMES 1019

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.615

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	7	0	7	66
EASTBOUND	0	0	0	0
NORTHBOUND	3	346	14	0
SOUTHBOUND	132	425	16	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	7	N/A	N/A	7	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	180	N/A	184	N/A	N/A
SOUTHBOUND	132	N/A	220	220	N/A	N/A

EAST-WEST CRITICAL VOLUMES 7
NORTH-SOUTH CRITICAL VOLUMES 316

THE SUM OF CRITICAL VOLUMES 323

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.172

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	1	8	20	50
EASTBOUND	82	18	23	12
NORTHBOUND	24	404	8	0
SOUTHBOUND	97	571	69	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	9	N/A	N/A	20	N/A
EASTBOUND	82	N/A	18	N/A	23	N/A
NORTHBOUND	24	N/A	137	137	N/A	N/A
SOUTHBOUND	97	N/A	213	213	N/A	N/A

EAST-WEST CRITICAL VOLUMES 102
NORTH-SOUTH CRITICAL VOLUMES 237

THE SUM OF CRITICAL VOLUMES 339

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.181

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	12	1	56	98
EASTBOUND	34	3	5	0
NORTHBOUND	5	550	22	0
SOUTHBOUND	196	696	30	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	13	N/A	N/A	56	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	42
NORTHBOUND	5	N/A	191	191	N/A	N/A
SOUTHBOUND	196	N/A	242	242	N/A	N/A

EAST-WEST CRITICAL VOLUMES 90
NORTH-SOUTH CRITICAL VOLUMES 387

THE SUM OF CRITICAL VOLUMES 477

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.254

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	568	0	373	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	355	0	422
SOUTHBOUND	723	352	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	312	N/A	N/A	N/A	186	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	178	N/A	0	N/A
SOUTHBOUND	723	N/A	117	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 312
NORTH-SOUTH CRITICAL VOLUMES 901

THE SUM OF CRITICAL VOLUMES 1213

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.751

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	175	576	0	36
EASTBOUND	33	487	313	116
NORTHBOUND	322	232	116	88
SOUTHBOUND	147	488	29	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	175	N/A	288	N/A	0	N/A
EASTBOUND	33	N/A	244	N/A	313	N/A
NORTHBOUND	177	N/A	232	N/A	116	N/A
SOUTHBOUND	147	N/A	N/A	517	N/A	N/A

EAST-WEST CRITICAL VOLUMES 488
NORTH-SOUTH CRITICAL VOLUMES 749

THE SUM OF CRITICAL VOLUMES 1237

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.768

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	98	1102	72	0
EASTBOUND	41	1009	33	0
NORTHBOUND	33	39	46	0
SOUTHBOUND	366	46	184	20

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	98	N/A	587	587	N/A	N/A
EASTBOUND	41	N/A	521	521	N/A	N/A
NORTHBOUND	N/A	57	N/A	62	N/A	N/A
SOUTHBOUND	366	N/A	46	N/A	184	N/A

EAST-WEST CRITICAL VOLUMES 628
NORTH-SOUTH CRITICAL VOLUMES 428

THE SUM OF CRITICAL VOLUMES 1056

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.604

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	361	993	0	0
EASTBOUND	0	1005	130	0
NORTHBOUND	0	0	0	172
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	361	N/A	496	N/A	N/A	N/A
EASTBOUND	N/A	N/A	502	N/A	130	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	0	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 863
NORTH-SOUTH CRITICAL VOLUMES 0

THE SUM OF CRITICAL VOLUMES 863

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.719

LEVEL OF SERVICE C

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	486	945	139	255
EASTBOUND	295	1076	303	364
NORTHBOUND	662	1522	332	0
SOUTHBOUND	463	2230	191	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	267	N/A	472	N/A	139	N/A
EASTBOUND	162	N/A	538	N/A	303	N/A
NORTHBOUND	364	N/A	618	618	N/A	N/A
SOUTHBOUND	255	N/A	807	807	N/A	N/A

EAST-WEST CRITICAL VOLUMES 805
NORTH-SOUTH CRITICAL VOLUMES 1171

THE SUM OF CRITICAL VOLUMES 1976

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 1.337

LEVEL OF SERVICE ..... F

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	178	0	0	644
EASTBOUND	0	0	0	0
NORTHBOUND	0	1833	161	0
SOUTHBOUND	740	1742	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	98	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	665	665	N/A	N/A
SOUTHBOUND	407	N/A	581	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 98
NORTH-SOUTH CRITICAL VOLUMES 1072

THE SUM OF CRITICAL VOLUMES 1170

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.721

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	15	1	33	0
EASTBOUND	300	2	0	48
NORTHBOUND	81	1488	14	0
SOUTHBOUND	7	1382	300	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	49
EASTBOUND	151	151	N/A	N/A	0	N/A
NORTHBOUND	81	N/A	501	501	N/A	N/A
SOUTHBOUND	7	N/A	561	561	N/A	N/A

EAST-WEST CRITICAL VOLUMES 200
NORTH-SOUTH CRITICAL VOLUMES 642

THE SUM OF CRITICAL VOLUMES 842

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.512

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	348	533	54	0
EASTBOUND	0	468	93	0
NORTHBOUND	137	1813	332	0
SOUTHBOUND	119	1406	91	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	191	N/A	294	294	N/A	N/A
EASTBOUND	N/A	N/A	280	280	N/A	N/A
NORTHBOUND	137	N/A	715	715	N/A	N/A
SOUTHBOUND	119	N/A	499	499	N/A	N/A

EAST-WEST CRITICAL VOLUMES 471
NORTH-SOUTH CRITICAL VOLUMES 834

THE SUM OF CRITICAL VOLUMES 1305

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.849

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	27	37	17	0
EASTBOUND	121	38	0	858
NORTHBOUND	650	2016	31	0
SOUTHBOUND	34	1926	73	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	40	N/A	40	N/A	N/A
EASTBOUND	121	N/A	38	N/A	0	N/A
NORTHBOUND	358	N/A	682	682	N/A	N/A
SOUTHBOUND	34	N/A	666	666	N/A	N/A

EAST-WEST CRITICAL VOLUMES 161
NORTH-SOUTH CRITICAL VOLUMES 1024

THE SUM OF CRITICAL VOLUMES 1185

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.732

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	54	22	135	201
EASTBOUND	25	49	19	0
NORTHBOUND	15	1150	172	0
SOUTHBOUND	201	1363	22	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	54	N/A	N/A	78	78	N/A
EASTBOUND	N/A	46	N/A	46	N/A	N/A
NORTHBOUND	15	N/A	661	661	N/A	N/A
SOUTHBOUND	201	N/A	692	692	N/A	N/A

EAST-WEST CRITICAL VOLUMES 103
NORTH-SOUTH CRITICAL VOLUMES 862

THE SUM OF CRITICAL VOLUMES 965

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.577

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	331	33	263	156
EASTBOUND	35	58	11	0
NORTHBOUND	48	943	169	0
SOUTHBOUND	313	1141	58	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	182	182	N/A	N/A	263	N/A
EASTBOUND	35	N/A	N/A	69	N/A	N/A
NORTHBOUND	48	N/A	556	556	N/A	N/A
SOUTHBOUND	313	N/A	600	600	N/A	N/A

EAST-WEST CRITICAL VOLUMES 332
NORTH-SOUTH CRITICAL VOLUMES 869

THE SUM OF CRITICAL VOLUMES 1201

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.743

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	127	0	544
EASTBOUND	127	237	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	805	0	102	127

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	127	N/A	0	N/A
EASTBOUND	127	N/A	118	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	443	N/A	N/A	N/A	102	N/A

EAST-WEST CRITICAL VOLUMES 254
NORTH-SOUTH CRITICAL VOLUMES 443

THE SUM OF CRITICAL VOLUMES 697

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.372

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	944	61	0
EASTBOUND	37	549	0	0
NORTHBOUND	382	699	167	132
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	502	502	N/A	N/A
EASTBOUND	37	N/A	274	N/A	N/A	N/A
NORTHBOUND	360	360	360	N/A	167	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 539
NORTH-SOUTH CRITICAL VOLUMES 360

THE SUM OF CRITICAL VOLUMES 899

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.531

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 4/11/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: EXISTING (2007)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	417	908	0	0
EASTBOUND	0	530	445	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	56	864	39	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	417	N/A	454	N/A	N/A	N/A
EASTBOUND	N/A	N/A	325	325	325	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	56	N/A	452	452	N/A	N/A

EAST-WEST CRITICAL VOLUMES 742
NORTH-SOUTH CRITICAL VOLUMES 452

THE SUM OF CRITICAL VOLUMES 1194

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.738

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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Future (2013) With Ambient Growth Only

CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	15	1	125	38
EASTBOUND	0	0	0	0
NORTHBOUND	2	623	6	0
SOUTHBOUND	76	242	15	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	16	N/A	N/A	125	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	315	N/A	316	N/A	N/A
SOUTHBOUND	76	N/A	128	128	N/A	N/A

EAST-WEST CRITICAL VOLUMES 125
NORTH-SOUTH CRITICAL VOLUMES 392

THE SUM OF CRITICAL VOLUMES 517

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.276

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	2	21	81	20
EASTBOUND	151	11	0	19
NORTHBOUND	65	700	9	0
SOUTHBOUND	40	312	32	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	23	N/A	N/A	81	N/A
EASTBOUND	151	N/A	11	N/A	0	N/A
NORTHBOUND	65	N/A	236	236	N/A	N/A
SOUTHBOUND	40	N/A	115	115	N/A	N/A

EAST-WEST CRITICAL VOLUMES 232
NORTH-SOUTH CRITICAL VOLUMES 276

THE SUM OF CRITICAL VOLUMES 508

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.271

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	19	0	159	63
EASTBOUND	77	2	0	0
NORTHBOUND	5	922	16	0
SOUTHBOUND	126	349	24	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	19	N/A	N/A	159	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	79
NORTHBOUND	5	N/A	313	313	N/A	N/A
SOUTHBOUND	126	N/A	124	124	N/A	N/A

EAST-WEST CRITICAL VOLUMES 236
NORTH-SOUTH CRITICAL VOLUMES 439

THE SUM OF CRITICAL VOLUMES 675

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.360

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	360	0	867	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	585	0	659
SOUTHBOUND	457	164	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	198	N/A	N/A	N/A	434	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	292	N/A	0	N/A
SOUTHBOUND	457	N/A	55	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 434
NORTH-SOUTH CRITICAL VOLUMES 749

THE SUM OF CRITICAL VOLUMES 1183

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.730

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	123	409	0	33
EASTBOUND	66	579	0	270
NORTHBOUND	518	546	291	61
SOUTHBOUND	58	235	9	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	123	N/A	204	N/A	0	N/A
EASTBOUND	66	N/A	290	N/A	0	N/A
NORTHBOUND	285	N/A	546	N/A	291	N/A
SOUTHBOUND	58	N/A	N/A	244	N/A	N/A

EAST-WEST CRITICAL VOLUMES 412
NORTH-SOUTH CRITICAL VOLUMES 790

THE SUM OF CRITICAL VOLUMES 1202

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.744

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	42	844	83	0
EASTBOUND	103	939	6	0
NORTHBOUND	42	81	61	0
SOUTHBOUND	157	28	29	52

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	42	N/A	464	464	N/A	N/A
EASTBOUND	103	N/A	472	472	N/A	N/A
NORTHBOUND	N/A	92	N/A	92	N/A	N/A
SOUTHBOUND	157	N/A	28	N/A	29	N/A

EAST-WEST CRITICAL VOLUMES 567
NORTH-SOUTH CRITICAL VOLUMES 249

THE SUM OF CRITICAL VOLUMES 816

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.444

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	129	941	0	0
EASTBOUND	0	983	0	82
NORTHBOUND	0	0	180	64
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	129	N/A	470	N/A	N/A	N/A
EASTBOUND	N/A	N/A	492	N/A	0	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	180	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 621
NORTH-SOUTH CRITICAL VOLUMES 180

THE SUM OF CRITICAL VOLUMES 801

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.668

LEVEL OF SERVICE ..... B

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	180	543	53	145
EASTBOUND	170	752	208	236
NORTHBOUND	430	1492	244	0
SOUTHBOUND	264	1434	173	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	99	N/A	272	N/A	53	N/A
EASTBOUND	94	N/A	376	N/A	208	N/A
NORTHBOUND	236	N/A	579	579	N/A	N/A
SOUTHBOUND	145	N/A	536	536	N/A	N/A

EAST-WEST CRITICAL VOLUMES 475
NORTH-SOUTH CRITICAL VOLUMES 772

THE SUM OF CRITICAL VOLUMES 1247

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.807

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	146	0	0	779
EASTBOUND	0	0	0	0
NORTHBOUND	0	1871	124	0
SOUTHBOUND	736	1293	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	80	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	665	665	N/A	N/A
SOUTHBOUND	405	N/A	431	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 80
NORTH-SOUTH CRITICAL VOLUMES 1070

THE SUM OF CRITICAL VOLUMES 1150

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.707

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	8	7	37	0
EASTBOUND	250	1	0	45
NORTHBOUND	166	2583	9	0
SOUTHBOUND	27	1328	162	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	52
EASTBOUND	126	126	N/A	N/A	0	N/A
NORTHBOUND	166	N/A	864	864	N/A	N/A
SOUTHBOUND	27	N/A	497	497	N/A	N/A

EAST-WEST CRITICAL VOLUMES 178
NORTH-SOUTH CRITICAL VOLUMES 891

THE SUM OF CRITICAL VOLUMES 1069

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.677

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	231	399	62	0
EASTBOUND	0	410	41	0
NORTHBOUND	155	1957	319	0
SOUTHBOUND	62	1145	44	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	127	N/A	230	230	N/A	N/A
EASTBOUND	N/A	N/A	226	226	N/A	N/A
NORTHBOUND	155	N/A	759	759	N/A	N/A
SOUTHBOUND	62	N/A	396	396	N/A	N/A

EAST-WEST CRITICAL VOLUMES 353
NORTH-SOUTH CRITICAL VOLUMES 821

THE SUM OF CRITICAL VOLUMES 1174

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.754

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	15	23	23	0
EASTBOUND	75	18	0	643
NORTHBOUND	796	2241	33	0
SOUTHBOUND	45	1380	39	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	30	N/A	30	N/A	N/A
EASTBOUND	75	N/A	18	N/A	0	N/A
NORTHBOUND	438	N/A	758	758	N/A	N/A
SOUTHBOUND	45	N/A	473	473	N/A	N/A

EAST-WEST CRITICAL VOLUMES 105
NORTH-SOUTH CRITICAL VOLUMES 911

THE SUM OF CRITICAL VOLUMES 1016

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.613

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	57	29	151	171
EASTBOUND	19	36	24	0
NORTHBOUND	28	987	104	0
SOUTHBOUND	171	1342	20	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	57	N/A	N/A	90	90	N/A
EASTBOUND	N/A	40	N/A	40	N/A	N/A
NORTHBOUND	28	N/A	546	546	N/A	N/A
SOUTHBOUND	171	N/A	681	681	N/A	N/A

EAST-WEST CRITICAL VOLUMES 109
NORTH-SOUTH CRITICAL VOLUMES 717

THE SUM OF CRITICAL VOLUMES 826

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.480

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	125	17	270	144
EASTBOUND	22	36	25	0
NORTHBOUND	16	843	66	0
SOUTHBOUND	289	807	16	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	71	71	N/A	N/A	270	N/A
EASTBOUND	22	N/A	N/A	61	N/A	N/A
NORTHBOUND	16	N/A	454	454	N/A	N/A
SOUTHBOUND	289	N/A	412	412	N/A	N/A

EAST-WEST CRITICAL VOLUMES 331
NORTH-SOUTH CRITICAL VOLUMES 743

THE SUM OF CRITICAL VOLUMES 1074

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.654

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	89	0	743
EASTBOUND	90	108	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	580	0	0	73

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	89	N/A	0	N/A
EASTBOUND	90	N/A	54	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	319	N/A	N/A	N/A	0	N/A

EAST-WEST CRITICAL VOLUMES 179
NORTH-SOUTH CRITICAL VOLUMES 319

THE SUM OF CRITICAL VOLUMES 498

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.266

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	653	26	0
EASTBOUND	11	412	0	0
NORTHBOUND	379	787	210	72
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	340	340	N/A	N/A
EASTBOUND	11	N/A	206	N/A	N/A	N/A
NORTHBOUND	379	N/A	394	N/A	210	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 351
NORTH-SOUTH CRITICAL VOLUMES 394

THE SUM OF CRITICAL VOLUMES 745

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.423

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	277	754	0	0
EASTBOUND	0	400	541	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	24	917	13	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	277	N/A	377	N/A	N/A	N/A
EASTBOUND	N/A	N/A	314	314	314	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	24	N/A	465	465	N/A	N/A

EAST-WEST CRITICAL VOLUMES 591
NORTH-SOUTH CRITICAL VOLUMES 465

THE SUM OF CRITICAL VOLUMES 1056

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.641

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	7	0	8	68
EASTBOUND	0	0	0	0
NORTHBOUND	3	359	15	0
SOUTHBOUND	137	440	17	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	7	N/A	N/A	8	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	187	N/A	190	N/A	N/A
SOUTHBOUND	137	N/A	228	228	N/A	N/A

EAST-WEST CRITICAL VOLUMES 8
NORTH-SOUTH CRITICAL VOLUMES 327

THE SUM OF CRITICAL VOLUMES 335

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.179

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	1	8	21	52
EASTBOUND	86	19	24	12
NORTHBOUND	25	419	8	0
SOUTHBOUND	100	592	72	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	9	N/A	N/A	21	N/A
EASTBOUND	86	N/A	19	N/A	24	N/A
NORTHBOUND	25	N/A	142	142	N/A	N/A
SOUTHBOUND	100	N/A	221	221	N/A	N/A

EAST-WEST CRITICAL VOLUMES 107
NORTH-SOUTH CRITICAL VOLUMES 246

THE SUM OF CRITICAL VOLUMES 353

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.188

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	13	1	58	102
EASTBOUND	35	3	5	0
NORTHBOUND	5	570	23	0
SOUTHBOUND	203	722	31	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	14	N/A	N/A	58	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	43
NORTHBOUND	5	N/A	198	198	N/A	N/A
SOUTHBOUND	203	N/A	251	251	N/A	N/A

EAST-WEST CRITICAL VOLUMES 93
NORTH-SOUTH CRITICAL VOLUMES 401

THE SUM OF CRITICAL VOLUMES 494

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.263

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	589	0	387	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	368	0	437
SOUTHBOUND	750	365	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	324	N/A	N/A	N/A	194	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	184	N/A	0	N/A
SOUTHBOUND	750	N/A	122	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 324
NORTH-SOUTH CRITICAL VOLUMES 934

THE SUM OF CRITICAL VOLUMES 1258

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.783

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	181	598	0	38
EASTBOUND	34	505	324	120
NORTHBOUND	334	241	122	90
SOUTHBOUND	152	506	30	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	181	N/A	299	N/A	0	N/A
EASTBOUND	34	N/A	252	N/A	324	N/A
NORTHBOUND	184	N/A	241	N/A	122	N/A
SOUTHBOUND	152	N/A	N/A	536	N/A	N/A

EAST-WEST CRITICAL VOLUMES 504
NORTH-SOUTH CRITICAL VOLUMES 777

THE SUM OF CRITICAL VOLUMES 1281

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.799

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	102	1142	75	0
EASTBOUND	42	1046	34	0
NORTHBOUND	34	40	48	0
SOUTHBOUND	379	48	190	21

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	102	N/A	608	608	N/A	N/A
EASTBOUND	42	N/A	540	540	N/A	N/A
NORTHBOUND	N/A	58	N/A	64	N/A	N/A
SOUTHBOUND	379	N/A	48	N/A	190	N/A

EAST-WEST CRITICAL VOLUMES 650
NORTH-SOUTH CRITICAL VOLUMES 443

THE SUM OF CRITICAL VOLUMES 1093

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.629

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	375	1029	0	0
EASTBOUND	0	1042	134	0
NORTHBOUND	0	0	0	178
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	375	N/A	514	N/A	N/A	N/A
EASTBOUND	N/A	N/A	521	N/A	134	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	0	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 896
NORTH-SOUTH CRITICAL VOLUMES 0

THE SUM OF CRITICAL VOLUMES 896

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.747

LEVEL OF SERVICE C

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	504	979	145	264
EASTBOUND	306	1116	314	377
NORTHBOUND	686	1578	344	0
SOUTHBOUND	480	2312	198	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	277	N/A	490	N/A	145	N/A
EASTBOUND	168	N/A	558	N/A	314	N/A
NORTHBOUND	377	N/A	641	641	N/A	N/A
SOUTHBOUND	264	N/A	837	837	N/A	N/A

EAST-WEST CRITICAL VOLUMES 835
NORTH-SOUTH CRITICAL VOLUMES 1214

THE SUM OF CRITICAL VOLUMES 2049

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 1.390

LEVEL OF SERVICE ..... F

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	185	0	0	667
EASTBOUND	0	0	0	0
NORTHBOUND	0	1900	167	0
SOUTHBOUND	767	1806	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	102	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	689	689	N/A	N/A
SOUTHBOUND	422	N/A	602	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 102
NORTH-SOUTH CRITICAL VOLUMES 1111

THE SUM OF CRITICAL VOLUMES 1213

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.751

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	16	1	34	0
EASTBOUND	311	2	0	50
NORTHBOUND	84	1542	15	0
SOUTHBOUND	7	1433	311	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	51
EASTBOUND	156	156	N/A	N/A	0	N/A
NORTHBOUND	84	N/A	519	519	N/A	N/A
SOUTHBOUND	7	N/A	581	581	N/A	N/A

EAST-WEST CRITICAL VOLUMES 207
NORTH-SOUTH CRITICAL VOLUMES 665

THE SUM OF CRITICAL VOLUMES 872

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.534

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	361	552	56	0
EASTBOUND	0	485	96	0
NORTHBOUND	142	1879	344	0
SOUTHBOUND	123	1457	94	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	199	N/A	304	304	N/A	N/A
EASTBOUND	N/A	N/A	290	290	N/A	N/A
NORTHBOUND	142	N/A	741	741	N/A	N/A
SOUTHBOUND	123	N/A	517	517	N/A	N/A

EAST-WEST CRITICAL VOLUMES 489
NORTH-SOUTH CRITICAL VOLUMES 864

THE SUM OF CRITICAL VOLUMES 1353

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.884

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	28	38	18	0
EASTBOUND	125	39	0	889
NORTHBOUND	674	2090	32	0
SOUTHBOUND	35	1996	76	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	42	N/A	42	N/A	N/A
EASTBOUND	125	N/A	39	N/A	0	N/A
NORTHBOUND	371	N/A	707	707	N/A	N/A
SOUTHBOUND	35	N/A	691	691	N/A	N/A

EAST-WEST CRITICAL VOLUMES 167
NORTH-SOUTH CRITICAL VOLUMES 1062

THE SUM OF CRITICAL VOLUMES 1229

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.762

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	56	23	140	208
EASTBOUND	26	51	20	0
NORTHBOUND	16	1192	178	0
SOUTHBOUND	208	1413	23	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	56	N/A	N/A	82	82	N/A
EASTBOUND	N/A	48	N/A	48	N/A	N/A
NORTHBOUND	16	N/A	685	685	N/A	N/A
SOUTHBOUND	208	N/A	718	718	N/A	N/A

EAST-WEST CRITICAL VOLUMES 108
NORTH-SOUTH CRITICAL VOLUMES 893

THE SUM OF CRITICAL VOLUMES 1001

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.602

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	343	34	272	162
EASTBOUND	36	60	11	0
NORTHBOUND	50	977	175	0
SOUTHBOUND	324	1183	60	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	188	188	N/A	N/A	272	N/A
EASTBOUND	36	N/A	N/A	71	N/A	N/A
NORTHBOUND	50	N/A	576	576	N/A	N/A
SOUTHBOUND	324	N/A	622	622	N/A	N/A

EAST-WEST CRITICAL VOLUMES 343
NORTH-SOUTH CRITICAL VOLUMES 900

THE SUM OF CRITICAL VOLUMES 1243

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.772

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	132	0	564
EASTBOUND	132	246	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	834	0	105	132

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	132	N/A	0	N/A
EASTBOUND	132	N/A	123	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	459	N/A	N/A	N/A	105	N/A

EAST-WEST CRITICAL VOLUMES 264
NORTH-SOUTH CRITICAL VOLUMES 459

THE SUM OF CRITICAL VOLUMES 723

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.386

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	978	64	0
EASTBOUND	39	569	0	0
NORTHBOUND	396	725	172	138
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	521	521	N/A	N/A
EASTBOUND	39	N/A	284	N/A	N/A	N/A
NORTHBOUND	374	374	374	N/A	172	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 560
NORTH-SOUTH CRITICAL VOLUMES 374

THE SUM OF CRITICAL VOLUMES 934

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.555

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITHOUT PROJECT (AMBIENT GROWTH ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	433	942	0	0
EASTBOUND	0	550	461	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	58	896	41	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	433	N/A	471	N/A	N/A	N/A
EASTBOUND	N/A	N/A	337	337	337	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	58	N/A	468	468	N/A	N/A

EAST-WEST CRITICAL VOLUMES 770
NORTH-SOUTH CRITICAL VOLUMES 468

THE SUM OF CRITICAL VOLUMES 1238

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.769

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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Future (2013) With Ambient Growth Plus Project
(Combined Parcels 10R, FF, 9U)

CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	15	1	125	38
EASTBOUND	0	0	0	0
NORTHBOUND	2	623	6	0
SOUTHBOUND	76	245	15	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	16	N/A	N/A	125	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	315	N/A	316	N/A	N/A
SOUTHBOUND	76	N/A	130	130	N/A	N/A

EAST-WEST CRITICAL VOLUMES 125
NORTH-SOUTH CRITICAL VOLUMES 392

THE SUM OF CRITICAL VOLUMES 517

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.276

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	4	26	156	28
EASTBOUND	151	13	0	19
NORTHBOUND	66	775	9	0
SOUTHBOUND	57	380	32	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	30	N/A	N/A	156	N/A
EASTBOUND	151	N/A	13	N/A	0	N/A
NORTHBOUND	66	N/A	261	261	N/A	N/A
SOUTHBOUND	57	N/A	137	137	N/A	N/A

EAST-WEST CRITICAL VOLUMES 307
NORTH-SOUTH CRITICAL VOLUMES 318

THE SUM OF CRITICAL VOLUMES 625

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.333

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	19	0	159	63
EASTBOUND	77	2	0	0
NORTHBOUND	5	1080	16	0
SOUTHBOUND	126	434	24	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	19	N/A	N/A	159	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	79
NORTHBOUND	5	N/A	365	365	N/A	N/A
SOUTHBOUND	126	N/A	153	153	N/A	N/A

EAST-WEST CRITICAL VOLUMES 236
NORTH-SOUTH CRITICAL VOLUMES 491

THE SUM OF CRITICAL VOLUMES 727

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.388

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	413	0	867	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	638	0	764
SOUTHBOUND	457	196	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	227	N/A	N/A	N/A	434	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	319	N/A	0	N/A
SOUTHBOUND	457	N/A	65	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 434
NORTH-SOUTH CRITICAL VOLUMES 776

THE SUM OF CRITICAL VOLUMES 1210

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.749

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	149	409	0	33
EASTBOUND	66	579	0	273
NORTHBOUND	523	559	313	74
SOUTHBOUND	58	239	9	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	149	N/A	204	N/A	0	N/A
EASTBOUND	66	N/A	290	N/A	0	N/A
NORTHBOUND	288	N/A	559	N/A	313	N/A
SOUTHBOUND	58	N/A	N/A	248	N/A	N/A

EAST-WEST CRITICAL VOLUMES 438
NORTH-SOUTH CRITICAL VOLUMES 807

THE SUM OF CRITICAL VOLUMES 1245

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.774

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	42	896	83	0
EASTBOUND	103	1044	6	0
NORTHBOUND	42	81	61	0
SOUTHBOUND	157	28	30	52

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	42	N/A	490	490	N/A	N/A
EASTBOUND	103	N/A	525	525	N/A	N/A
NORTHBOUND	N/A	92	N/A	92	N/A	N/A
SOUTHBOUND	157	N/A	28	N/A	30	N/A

EAST-WEST CRITICAL VOLUMES 593
NORTH-SOUTH CRITICAL VOLUMES 249

THE SUM OF CRITICAL VOLUMES 842

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.461

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	130	967	0	0
EASTBOUND	0	1018	0	82
NORTHBOUND	0	0	179	65
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	130	N/A	484	N/A	N/A	N/A
EASTBOUND	N/A	N/A	509	N/A	0	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	179	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 639
NORTH-SOUTH CRITICAL VOLUMES 179

THE SUM OF CRITICAL VOLUMES 818

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.682

LEVEL OF SERVICE ..... B

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	180	557	53	145
EASTBOUND	181	776	204	240
NORTHBOUND	436	1492	244	0
SOUTHBOUND	264	1434	180	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	99	N/A	278	N/A	53	N/A
EASTBOUND	100	N/A	388	N/A	204	N/A
NORTHBOUND	240	N/A	579	579	N/A	N/A
SOUTHBOUND	145	N/A	538	538	N/A	N/A

EAST-WEST CRITICAL VOLUMES 487
NORTH-SOUTH CRITICAL VOLUMES 778

THE SUM OF CRITICAL VOLUMES 1265

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.820

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	146	0	0	785
EASTBOUND	0	0	0	0
NORTHBOUND	0	1871	124	0
SOUTHBOUND	736	1293	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	80	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	665	665	N/A	N/A
SOUTHBOUND	405	N/A	431	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 80
NORTH-SOUTH CRITICAL VOLUMES 1070

THE SUM OF CRITICAL VOLUMES 1150

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.707

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	8	7	37	0
EASTBOUND	250	1	0	48
NORTHBOUND	169	2583	9	0
SOUTHBOUND	27	1328	162	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	52
EASTBOUND	126	126	N/A	N/A	0	N/A
NORTHBOUND	169	N/A	864	864	N/A	N/A
SOUTHBOUND	27	N/A	497	497	N/A	N/A

EAST-WEST CRITICAL VOLUMES 178
NORTH-SOUTH CRITICAL VOLUMES 891

THE SUM OF CRITICAL VOLUMES 1069

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.677

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	231	434	62	0
EASTBOUND	0	481	47	0
NORTHBOUND	159	1960	319	0
SOUTHBOUND	62	1148	44	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	127	N/A	248	248	N/A	N/A
EASTBOUND	N/A	N/A	264	264	N/A	N/A
NORTHBOUND	159	N/A	760	760	N/A	N/A
SOUTHBOUND	62	N/A	397	397	N/A	N/A

EAST-WEST CRITICAL VOLUMES 391
NORTH-SOUTH CRITICAL VOLUMES 822

THE SUM OF CRITICAL VOLUMES 1213

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.782

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	15	23	23	0
EASTBOUND	75	18	0	663
NORTHBOUND	805	2248	33	0
SOUTHBOUND	45	1389	39	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	30	N/A	30	N/A	N/A
EASTBOUND	75	N/A	18	N/A	0	N/A
NORTHBOUND	443	N/A	760	760	N/A	N/A
SOUTHBOUND	45	N/A	476	476	N/A	N/A

EAST-WEST CRITICAL VOLUMES 105
NORTH-SOUTH CRITICAL VOLUMES 919

THE SUM OF CRITICAL VOLUMES 1024

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.619

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	57	29	151	174
EASTBOUND	19	36	24	0
NORTHBOUND	28	1036	104	0
SOUTHBOUND	174	1443	21	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	57	N/A	N/A	90	90	N/A
EASTBOUND	N/A	40	N/A	40	N/A	N/A
NORTHBOUND	28	N/A	570	570	N/A	N/A
SOUTHBOUND	174	N/A	732	732	N/A	N/A

EAST-WEST CRITICAL VOLUMES 109
NORTH-SOUTH CRITICAL VOLUMES 760

THE SUM OF CRITICAL VOLUMES 869

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.510

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	125	17	270	183
EASTBOUND	22	36	25	0
NORTHBOUND	16	853	66	0
SOUTHBOUND	366	830	17	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	71	71	N/A	N/A	270	N/A
EASTBOUND	22	N/A	N/A	61	N/A	N/A
NORTHBOUND	16	N/A	460	460	N/A	N/A
SOUTHBOUND	366	N/A	424	424	N/A	N/A

EAST-WEST CRITICAL VOLUMES 331
NORTH-SOUTH CRITICAL VOLUMES 826

THE SUM OF CRITICAL VOLUMES 1157

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.712

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	89	0	752
EASTBOUND	91	108	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	600	0	0	76

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	89	N/A	0	N/A
EASTBOUND	91	N/A	54	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	330	N/A	N/A	N/A	0	N/A

EAST-WEST CRITICAL VOLUMES 180
NORTH-SOUTH CRITICAL VOLUMES 330

THE SUM OF CRITICAL VOLUMES 510

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.272

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	653	26	0
EASTBOUND	11	412	0	0
NORTHBOUND	414	793	210	72
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	340	340	N/A	N/A
EASTBOUND	11	N/A	206	N/A	N/A	N/A
NORTHBOUND	402	402	402	N/A	210	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 351
NORTH-SOUTH CRITICAL VOLUMES 402

THE SUM OF CRITICAL VOLUMES 753

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.428

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	277	789	0	0
EASTBOUND	0	400	612	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	24	917	13	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	277	N/A	394	N/A	N/A	N/A
EASTBOUND	N/A	N/A	337	337	337	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	24	N/A	465	465	N/A	N/A

EAST-WEST CRITICAL VOLUMES 614
NORTH-SOUTH CRITICAL VOLUMES 465

THE SUM OF CRITICAL VOLUMES 1079

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.657

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	7	0	8	68
EASTBOUND	0	0	0	0
NORTHBOUND	3	361	15	0
SOUTHBOUND	137	441	17	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	7	N/A	N/A	8	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	188	N/A	192	N/A	N/A
SOUTHBOUND	137	N/A	229	229	N/A	N/A

EAST-WEST CRITICAL VOLUMES 8
NORTH-SOUTH CRITICAL VOLUMES 329

THE SUM OF CRITICAL VOLUMES 337

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.180

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	1	10	20	82
EASTBOUND	86	22	0	37
NORTHBOUND	25	483	10	0
SOUTHBOUND	164	655	72	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	11	N/A	N/A	20	N/A
EASTBOUND	86	N/A	22	N/A	0	N/A
NORTHBOUND	25	N/A	164	164	N/A	N/A
SOUTHBOUND	164	N/A	242	242	N/A	N/A

EAST-WEST CRITICAL VOLUMES 106
NORTH-SOUTH CRITICAL VOLUMES 328

THE SUM OF CRITICAL VOLUMES 434

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.231

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	13	1	58	102
EASTBOUND	35	3	5	0
NORTHBOUND	5	663	23	0
SOUTHBOUND	203	849	31	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	14	N/A	N/A	58	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	43
NORTHBOUND	5	N/A	229	229	N/A	N/A
SOUTHBOUND	203	N/A	293	293	N/A	N/A

EAST-WEST CRITICAL VOLUMES 93
NORTH-SOUTH CRITICAL VOLUMES 432

THE SUM OF CRITICAL VOLUMES 525

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.280

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	673	0	387	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	398	0	500
SOUTHBOUND	750	408	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	370	N/A	N/A	N/A	194	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	199	N/A	0	N/A
SOUTHBOUND	750	N/A	136	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 370
NORTH-SOUTH CRITICAL VOLUMES 949

THE SUM OF CRITICAL VOLUMES 1319

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.826

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	210	598	0	38
EASTBOUND	34	505	325	123
NORTHBOUND	337	246	130	104
SOUTHBOUND	152	516	30	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	210	N/A	299	N/A	0	N/A
EASTBOUND	34	N/A	252	N/A	325	N/A
NORTHBOUND	185	N/A	246	N/A	130	N/A
SOUTHBOUND	152	N/A	N/A	546	N/A	N/A

EAST-WEST CRITICAL VOLUMES 534
NORTH-SOUTH CRITICAL VOLUMES 792

THE SUM OF CRITICAL VOLUMES 1326

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.831

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	102	1222	75	0
EASTBOUND	42	1109	34	0
NORTHBOUND	34	40	48	0
SOUTHBOUND	379	48	194	21

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	102	N/A	648	648	N/A	N/A
EASTBOUND	42	N/A	572	572	N/A	N/A
NORTHBOUND	N/A	57	N/A	64	N/A	N/A
SOUTHBOUND	379	N/A	48	N/A	194	N/A

EAST-WEST CRITICAL VOLUMES 690
NORTH-SOUTH CRITICAL VOLUMES 443

THE SUM OF CRITICAL VOLUMES 1133

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.655

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	379	1058	0	0
EASTBOUND	0	1064	134	0
NORTHBOUND	0	0	0	178
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	379	N/A	529	N/A	N/A	N/A
EASTBOUND	N/A	N/A	532	N/A	134	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	0	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 911
NORTH-SOUTH CRITICAL VOLUMES 0

THE SUM OF CRITICAL VOLUMES 911

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.759

LEVEL OF SERVICE C

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	504	999	145	264
EASTBOUND	314	1130	311	380
NORTHBOUND	691	1578	344	0
SOUTHBOUND	480	2312	206	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	277	N/A	500	N/A	145	N/A
EASTBOUND	173	N/A	565	N/A	311	N/A
NORTHBOUND	380	N/A	641	641	N/A	N/A
SOUTHBOUND	264	N/A	839	839	N/A	N/A

EAST-WEST CRITICAL VOLUMES 842
NORTH-SOUTH CRITICAL VOLUMES 1219

THE SUM OF CRITICAL VOLUMES 2061

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 1.399

LEVEL OF SERVICE ..... F

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	185	0	0	672
EASTBOUND	0	0	0	0
NORTHBOUND	0	1900	167	0
SOUTHBOUND	767	1806	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	102	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	689	689	N/A	N/A
SOUTHBOUND	422	N/A	602	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 102
NORTH-SOUTH CRITICAL VOLUMES 1111

THE SUM OF CRITICAL VOLUMES 1213

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.751

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	16	1	34	0
EASTBOUND	311	2	0	51
NORTHBOUND	88	1542	15	0
SOUTHBOUND	7	1433	311	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	51
EASTBOUND	156	156	N/A	N/A	0	N/A
NORTHBOUND	88	N/A	519	519	N/A	N/A
SOUTHBOUND	7	N/A	581	581	N/A	N/A

EAST-WEST CRITICAL VOLUMES 207
NORTH-SOUTH CRITICAL VOLUMES 669

THE SUM OF CRITICAL VOLUMES 876

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.537

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	361	604	56	0
EASTBOUND	0	528	101	0
NORTHBOUND	148	1883	344	0
SOUTHBOUND	123	1458	94	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	198	N/A	330	330	N/A	N/A
EASTBOUND	N/A	N/A	314	314	N/A	N/A
NORTHBOUND	148	N/A	742	742	N/A	N/A
SOUTHBOUND	123	N/A	517	517	N/A	N/A

EAST-WEST CRITICAL VOLUMES 512
NORTH-SOUTH CRITICAL VOLUMES 865

THE SUM OF CRITICAL VOLUMES 1377

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.901

LEVEL OF SERVICE ..... E

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	28	38	18	0
EASTBOUND	125	39	0	902
NORTHBOUND	688	2100	32	0
SOUTHBOUND	35	2002	76	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	42	N/A	42	N/A	N/A
EASTBOUND	125	N/A	39	N/A	0	N/A
NORTHBOUND	378	N/A	711	711	N/A	N/A
SOUTHBOUND	35	N/A	693	693	N/A	N/A

EAST-WEST CRITICAL VOLUMES 167
NORTH-SOUTH CRITICAL VOLUMES 1071

THE SUM OF CRITICAL VOLUMES 1238

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.769

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	56	23	143	209
EASTBOUND	27	51	20	0
NORTHBOUND	16	1267	178	0
SOUTHBOUND	209	1475	23	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	56	N/A	N/A	83	83	N/A
EASTBOUND	N/A	49	N/A	49	N/A	N/A
NORTHBOUND	16	N/A	722	722	N/A	N/A
SOUTHBOUND	209	N/A	749	749	N/A	N/A

EAST-WEST CRITICAL VOLUMES 110
NORTH-SOUTH CRITICAL VOLUMES 931

THE SUM OF CRITICAL VOLUMES 1041

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.631

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	343	34	306	186
EASTBOUND	37	60	11	0
NORTHBOUND	50	993	175	0
SOUTHBOUND	372	1197	60	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	188	188	N/A	N/A	306	N/A
EASTBOUND	37	N/A	N/A	71	N/A	N/A
NORTHBOUND	50	N/A	584	584	N/A	N/A
SOUTHBOUND	372	N/A	628	628	N/A	N/A

EAST-WEST CRITICAL VOLUMES 377
NORTH-SOUTH CRITICAL VOLUMES 956

THE SUM OF CRITICAL VOLUMES 1333

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.835

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	132	0	578
EASTBOUND	134	246	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	847	0	104	134

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	132	N/A	0	N/A
EASTBOUND	134	N/A	123	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	466	N/A	N/A	N/A	104	N/A

EAST-WEST CRITICAL VOLUMES 266
NORTH-SOUTH CRITICAL VOLUMES 466

THE SUM OF CRITICAL VOLUMES 732

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.390

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	978	64	0
EASTBOUND	39	569	0	0
NORTHBOUND	448	730	172	138
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	521	521	N/A	N/A
EASTBOUND	39	N/A	284	N/A	N/A	N/A
NORTHBOUND	393	393	393	N/A	172	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 560
NORTH-SOUTH CRITICAL VOLUMES 393

THE SUM OF CRITICAL VOLUMES 953

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.569

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJECT (PARCELS 10R,FF,9U)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	433	994	0	0
EASTBOUND	0	550	504	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	58	896	41	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	433	N/A	497	N/A	N/A	N/A
EASTBOUND	N/A	N/A	351	351	351	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	58	N/A	468	468	N/A	N/A

EAST-WEST CRITICAL VOLUMES 784
NORTH-SOUTH CRITICAL VOLUMES 468

THE SUM OF CRITICAL VOLUMES 1252

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.779

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMB. GROWTH+PROJ(PARCELS 10R,FF,9U)+MIT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	413	0	547	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	638	0	764
SOUTHBOUND	457	196	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	3	0	0	0	2	0	5
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	151	N/A	N/A	N/A	274	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	319	N/A	0	N/A
SOUTHBOUND	457	N/A	65	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 274
NORTH-SOUTH CRITICAL VOLUMES 776

THE SUM OF CRITICAL VOLUMES 1050

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.637

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMB. GROWTH+PROJ(PARCELS 10R,FF,9U)+MIT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	149	609	29	124
EASTBOUND	66	579	53	220
NORTHBOUND	323	439	313	74
SOUTHBOUND	58	239	9	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	149	N/A	304	N/A	29	N/A
EASTBOUND	66	N/A	290	N/A	53	N/A
NORTHBOUND	178	N/A	439	N/A	313	N/A
SOUTHBOUND	58	N/A	N/A	248	N/A	N/A

EAST-WEST CRITICAL VOLUMES 438
NORTH-SOUTH CRITICAL VOLUMES 687

THE SUM OF CRITICAL VOLUMES 1125

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.689

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMB. GROWTH+PROJ(PARCELS 10R,FF,9U)+MIT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	231	434	62	0
EASTBOUND	0	481	47	0
NORTHBOUND	159	1960	255	64
SOUTHBOUND	62	1148	44	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	3	0	1	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	127	N/A	248	248	N/A	N/A
EASTBOUND	N/A	N/A	264	264	N/A	N/A
NORTHBOUND	159	N/A	653	N/A	255	N/A
SOUTHBOUND	62	N/A	397	397	N/A	N/A

EAST-WEST CRITICAL VOLUMES 391
NORTH-SOUTH CRITICAL VOLUMES 715

THE SUM OF CRITICAL VOLUMES 1106

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.704

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMB. GROWTH+PROJ(PARCELS 10R,FF,9U)+MIT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	125	17	252	201
EASTBOUND	22	36	25	0
NORTHBOUND	16	853	66	0
SOUTHBOUND	366	830	17	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	2	0	1	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	71	71	N/A	N/A	252	N/A
EASTBOUND	22	N/A	N/A	61	N/A	N/A
NORTHBOUND	16	N/A	460	460	N/A	N/A
SOUTHBOUND	201	N/A	424	424	N/A	N/A

EAST-WEST CRITICAL VOLUMES 313
NORTH-SOUTH CRITICAL VOLUMES 661

THE SUM OF CRITICAL VOLUMES 974

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.608

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMB. GROWTH+PROJ(PARCELS 10R,FF,9U)+MIT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	673	0	112	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	398	0	500
SOUTHBOUND	750	408	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	3	0	0	0	2	0	5
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	247	N/A	N/A	N/A	56	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	199	N/A	0	N/A
SOUTHBOUND	750	N/A	136	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 247
NORTH-SOUTH CRITICAL VOLUMES 949

THE SUM OF CRITICAL VOLUMES 1196

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.739

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMB. GROWTH+PROJ(PARCELS 10R,FF,9U)+MIT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	210	728	0	183
EASTBOUND	34	505	384	64
NORTHBOUND	207	101	130	104
SOUTHBOUND	152	516	30	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	210	N/A	364	N/A	0	N/A
EASTBOUND	34	N/A	252	N/A	384	N/A
NORTHBOUND	114	N/A	101	N/A	130	N/A
SOUTHBOUND	152	N/A	N/A	546	N/A	N/A

EAST-WEST CRITICAL VOLUMES 594
NORTH-SOUTH CRITICAL VOLUMES 676

THE SUM OF CRITICAL VOLUMES 1270

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.791

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMB. GROWTH+PROJ(PARCELS 10R,FF,9U)+MIT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	361	604	56	0
EASTBOUND	0	528	101	0
NORTHBOUND	148	1883	245	99
SOUTHBOUND	123	1458	94	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	3	0	1	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	198	N/A	330	330	N/A	N/A
EASTBOUND	N/A	N/A	314	314	N/A	N/A
NORTHBOUND	148	N/A	628	N/A	245	N/A
SOUTHBOUND	123	N/A	517	517	N/A	N/A

EAST-WEST CRITICAL VOLUMES 512
NORTH-SOUTH CRITICAL VOLUMES 751

THE SUM OF CRITICAL VOLUMES 1263

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.819

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMB. GROWTH+PROJ(PARCELS 10R,FF,9U)+MIT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	343	34	287	205
EASTBOUND	37	60	11	0
NORTHBOUND	50	993	175	0
SOUTHBOUND	372	1197	60	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	2	0	1	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	188	188	N/A	N/A	287	N/A
EASTBOUND	37	N/A	N/A	71	N/A	N/A
NORTHBOUND	50	N/A	584	584	N/A	N/A
SOUTHBOUND	205	N/A	628	628	N/A	N/A

EAST-WEST CRITICAL VOLUMES 358
NORTH-SOUTH CRITICAL VOLUMES 789

THE SUM OF CRITICAL VOLUMES 1147

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.734

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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Future (2013) With Cumulative Development

CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	15	1	125	38
EASTBOUND	0	0	0	0
NORTHBOUND	2	630	6	0
SOUTHBOUND	76	263	15	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	16	N/A	N/A	125	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	319	N/A	320	N/A	N/A
SOUTHBOUND	76	N/A	139	139	N/A	N/A

EAST-WEST CRITICAL VOLUMES 125
NORTH-SOUTH CRITICAL VOLUMES 396

THE SUM OF CRITICAL VOLUMES 521

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.278

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	7	30	198	34
EASTBOUND	152	14	0	19
NORTHBOUND	67	781	10	0
SOUTHBOUND	68	395	35	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	37	N/A	N/A	198	N/A
EASTBOUND	152	N/A	14	N/A	0	N/A
NORTHBOUND	67	N/A	264	264	N/A	N/A
SOUTHBOUND	68	N/A	143	143	N/A	N/A

EAST-WEST CRITICAL VOLUMES 350
NORTH-SOUTH CRITICAL VOLUMES 332

THE SUM OF CRITICAL VOLUMES 682

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.364

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	19	0	173	87
EASTBOUND	165	2	0	0
NORTHBOUND	5	1183	16	0
SOUTHBOUND	174	473	35	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	19	N/A	N/A	173	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	167
NORTHBOUND	5	N/A	400	400	N/A	N/A
SOUTHBOUND	174	N/A	169	169	N/A	N/A

EAST-WEST CRITICAL VOLUMES 338
NORTH-SOUTH CRITICAL VOLUMES 574

THE SUM OF CRITICAL VOLUMES 912

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.508

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	478	0	933	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	724	0	906
SOUTHBOUND	484	230	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	263	N/A	N/A	N/A	466	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	362	N/A	0	N/A
SOUTHBOUND	484	N/A	77	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 466
NORTH-SOUTH CRITICAL VOLUMES 846

THE SUM OF CRITICAL VOLUMES 1312

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.821

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	171	456	0	34
EASTBOUND	67	629	0	293
NORTHBOUND	562	615	359	85
SOUTHBOUND	60	257	9	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	171	N/A	228	N/A	0	N/A
EASTBOUND	67	N/A	314	N/A	0	N/A
NORTHBOUND	309	N/A	615	N/A	359	N/A
SOUTHBOUND	60	N/A	N/A	266	N/A	N/A

EAST-WEST CRITICAL VOLUMES 484
NORTH-SOUTH CRITICAL VOLUMES 881

THE SUM OF CRITICAL VOLUMES 1365

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.858

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	61	1025	194	0
EASTBOUND	127	1225	10	0
NORTHBOUND	52	152	61	0
SOUTHBOUND	211	42	77	64

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	61	N/A	610	610	N/A	N/A
EASTBOUND	127	N/A	618	618	N/A	N/A
NORTHBOUND	N/A	132	N/A	132	N/A	N/A
SOUTHBOUND	211	N/A	42	N/A	77	N/A

EAST-WEST CRITICAL VOLUMES 737
NORTH-SOUTH CRITICAL VOLUMES 343

THE SUM OF CRITICAL VOLUMES 1080

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.620

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	223	1038	0	0
EASTBOUND	0	1122	0	90
NORTHBOUND	0	0	338	112
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	223	N/A	519	N/A	N/A	N/A
EASTBOUND	N/A	N/A	561	N/A	0	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	338	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 784
NORTH-SOUTH CRITICAL VOLUMES 338

THE SUM OF CRITICAL VOLUMES 1122

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.935

LEVEL OF SERVICE ..... E

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	196	600	66	150
EASTBOUND	215	938	269	285
NORTHBOUND	519	1727	281	0
SOUTHBOUND	273	1566	169	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	108	N/A	300	N/A	66	N/A
EASTBOUND	118	N/A	469	N/A	269	N/A
NORTHBOUND	285	N/A	669	669	N/A	N/A
SOUTHBOUND	150	N/A	578	578	N/A	N/A

EAST-WEST CRITICAL VOLUMES 577
NORTH-SOUTH CRITICAL VOLUMES 863

THE SUM OF CRITICAL VOLUMES 1440

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.947

LEVEL OF SERVICE ..... E

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	147	0	0	856
EASTBOUND	0	0	0	0
NORTHBOUND	0	2104	124	0
SOUTHBOUND	860	1516	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	81	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	743	743	N/A	N/A
SOUTHBOUND	473	N/A	505	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 81
NORTH-SOUTH CRITICAL VOLUMES 1216

THE SUM OF CRITICAL VOLUMES 1297

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.810

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	8	7	37	0
EASTBOUND	264	1	0	116
NORTHBOUND	194	2790	9	0
SOUTHBOUND	39	1576	172	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	52
EASTBOUND	132	132	N/A	N/A	0	N/A
NORTHBOUND	194	N/A	933	933	N/A	N/A
SOUTHBOUND	39	N/A	583	583	N/A	N/A

EAST-WEST CRITICAL VOLUMES 184
NORTH-SOUTH CRITICAL VOLUMES 972

THE SUM OF CRITICAL VOLUMES 1156

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.741

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	238	534	62	0
EASTBOUND	0	734	68	0
NORTHBOUND	178	2191	331	0
SOUTHBOUND	83	1442	44	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	131	N/A	298	298	N/A	N/A
EASTBOUND	N/A	N/A	401	401	N/A	N/A
NORTHBOUND	178	N/A	841	841	N/A	N/A
SOUTHBOUND	83	N/A	495	495	N/A	N/A

EAST-WEST CRITICAL VOLUMES 532
NORTH-SOUTH CRITICAL VOLUMES 924

THE SUM OF CRITICAL VOLUMES 1456

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.959

LEVEL OF SERVICE ..... E

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	15	23	23	0
EASTBOUND	118	18	0	732
NORTHBOUND	835	2467	33	0
SOUTHBOUND	45	1695	54	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	30	N/A	30	N/A	N/A
EASTBOUND	118	N/A	18	N/A	0	N/A
NORTHBOUND	459	N/A	833	833	N/A	N/A
SOUTHBOUND	45	N/A	583	583	N/A	N/A

EAST-WEST CRITICAL VOLUMES 148
NORTH-SOUTH CRITICAL VOLUMES 1042

THE SUM OF CRITICAL VOLUMES 1190

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.735

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	65	29	110	242
EASTBOUND	19	36	24	0
NORTHBOUND	29	1166	118	0
SOUTHBOUND	242	1720	22	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	65	N/A	N/A	70	70	N/A
EASTBOUND	N/A	40	N/A	40	N/A	N/A
NORTHBOUND	29	N/A	642	642	N/A	N/A
SOUTHBOUND	242	N/A	871	871	N/A	N/A

EAST-WEST CRITICAL VOLUMES 105
NORTH-SOUTH CRITICAL VOLUMES 900

THE SUM OF CRITICAL VOLUMES 1005

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.605

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	152	17	249	295
EASTBOUND	22	36	25	0
NORTHBOUND	17	905	116	0
SOUTHBOUND	590	889	18	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	84	84	N/A	N/A	249	N/A
EASTBOUND	22	N/A	N/A	61	N/A	N/A
NORTHBOUND	17	N/A	510	510	N/A	N/A
SOUTHBOUND	590	N/A	454	454	N/A	N/A

EAST-WEST CRITICAL VOLUMES 310
NORTH-SOUTH CRITICAL VOLUMES 1100

THE SUM OF CRITICAL VOLUMES 1410

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.889

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	120	0	766
EASTBOUND	179	186	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	635	0	0	128

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	120	N/A	0	N/A
EASTBOUND	179	N/A	93	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	349	N/A	N/A	N/A	0	N/A

EAST-WEST CRITICAL VOLUMES 299
NORTH-SOUTH CRITICAL VOLUMES 349

THE SUM OF CRITICAL VOLUMES 648

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.346

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	689	29	0
EASTBOUND	11	444	0	0
NORTHBOUND	506	859	210	74
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	359	359	N/A	N/A
EASTBOUND	11	N/A	222	N/A	N/A	N/A
NORTHBOUND	455	455	455	N/A	210	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 370
NORTH-SOUTH CRITICAL VOLUMES 455

THE SUM OF CRITICAL VOLUMES 825

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.479

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	298	894	0	0
EASTBOUND	0	422	876	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	34	1031	13	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	298	N/A	447	N/A	N/A	N/A
EASTBOUND	N/A	N/A	422	N/A	438	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	34	N/A	522	522	N/A	N/A

EAST-WEST CRITICAL VOLUMES 736
NORTH-SOUTH CRITICAL VOLUMES 522

THE SUM OF CRITICAL VOLUMES 1258

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.783

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	7	0	8	68
EASTBOUND	0	0	0	0
NORTHBOUND	3	386	15	0
SOUTHBOUND	137	465	17	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	7	N/A	N/A	8	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	200	N/A	204	N/A	N/A
SOUTHBOUND	137	N/A	241	241	N/A	N/A

EAST-WEST CRITICAL VOLUMES 8
NORTH-SOUTH CRITICAL VOLUMES 341

THE SUM OF CRITICAL VOLUMES 349

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.186

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	2	11	18	100
EASTBOUND	87	25	0	37
NORTHBOUND	26	505	12	0
SOUTHBOUND	200	678	84	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	13	N/A	N/A	18	N/A
EASTBOUND	87	N/A	25	N/A	0	N/A
NORTHBOUND	26	N/A	172	172	N/A	N/A
SOUTHBOUND	200	N/A	254	254	N/A	N/A

EAST-WEST CRITICAL VOLUMES 105
NORTH-SOUTH CRITICAL VOLUMES 372

THE SUM OF CRITICAL VOLUMES 477

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.254

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	13	1	98	119
EASTBOUND	67	3	5	0
NORTHBOUND	5	717	22	0
SOUTHBOUND	238	972	72	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	14	N/A	N/A	98	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	75
NORTHBOUND	5	N/A	246	246	N/A	N/A
SOUTHBOUND	238	N/A	348	348	N/A	N/A

EAST-WEST CRITICAL VOLUMES 165
NORTH-SOUTH CRITICAL VOLUMES 484

THE SUM OF CRITICAL VOLUMES 649

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.346

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	797	0	441	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	447	0	593
SOUTHBOUND	784	483	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	438	N/A	N/A	N/A	220	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	224	N/A	0	N/A
SOUTHBOUND	784	N/A	161	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 438
NORTH-SOUTH CRITICAL VOLUMES 1008

THE SUM OF CRITICAL VOLUMES 1446

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.915

LEVEL OF SERVICE ..... E

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	256	684	0	41
EASTBOUND	35	594	334	136
NORTHBOUND	369	273	149	128
SOUTHBOUND	155	556	32	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	256	N/A	342	N/A	0	N/A
EASTBOUND	35	N/A	297	N/A	334	N/A
NORTHBOUND	203	N/A	273	N/A	149	N/A
SOUTHBOUND	155	N/A	N/A	588	N/A	N/A

EAST-WEST CRITICAL VOLUMES 590
NORTH-SOUTH CRITICAL VOLUMES 861

THE SUM OF CRITICAL VOLUMES 1451

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.918

LEVEL OF SERVICE ..... E

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	104	1397	108	0
EASTBOUND	74	1224	35	0
NORTHBOUND	38	56	52	0
SOUTHBOUND	459	44	207	37

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	104	N/A	752	752	N/A	N/A
EASTBOUND	74	N/A	630	630	N/A	N/A
NORTHBOUND	N/A	68	N/A	78	N/A	N/A
SOUTHBOUND	459	N/A	44	N/A	207	N/A

EAST-WEST CRITICAL VOLUMES 826
NORTH-SOUTH CRITICAL VOLUMES 537

THE SUM OF CRITICAL VOLUMES 1363

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.809

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	481	1195	0	0
EASTBOUND	0	1185	139	10
NORTHBOUND	0	0	19	240
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	481	N/A	598	N/A	N/A	N/A
EASTBOUND	N/A	N/A	592	N/A	139	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	19	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 1073
NORTH-SOUTH CRITICAL VOLUMES 19

THE SUM OF CRITICAL VOLUMES 1092

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.910

LEVEL OF SERVICE ..... E

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	569	1071	154	280
EASTBOUND	290	1155	314	448
NORTHBOUND	815	1822	401	0
SOUTHBOUND	509	2587	209	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	313	N/A	536	N/A	154	N/A
EASTBOUND	160	N/A	578	N/A	314	N/A
NORTHBOUND	448	N/A	741	741	N/A	N/A
SOUTHBOUND	280	N/A	932	932	N/A	N/A

EAST-WEST CRITICAL VOLUMES 891
NORTH-SOUTH CRITICAL VOLUMES 1380

THE SUM OF CRITICAL VOLUMES 2271

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 1.552

LEVEL OF SERVICE ..... F

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	219	0	0	845
EASTBOUND	0	0	0	0
NORTHBOUND	0	2210	167	0
SOUTHBOUND	911	2095	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	120	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	792	792	N/A	N/A
SOUTHBOUND	501	N/A	698	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 120
NORTH-SOUTH CRITICAL VOLUMES 1293

THE SUM OF CRITICAL VOLUMES 1413

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.892

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	22	1	34	0
EASTBOUND	330	2	0	83
NORTHBOUND	119	1827	19	0
SOUTHBOUND	13	1696	332	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	57
EASTBOUND	166	166	N/A	N/A	0	N/A
NORTHBOUND	119	N/A	615	615	N/A	N/A
SOUTHBOUND	13	N/A	676	676	N/A	N/A

EAST-WEST CRITICAL VOLUMES 223
NORTH-SOUTH CRITICAL VOLUMES 795

THE SUM OF CRITICAL VOLUMES 1018

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.640

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	369	783	56	0
EASTBOUND	0	662	114	0
NORTHBOUND	171	2205	369	0
SOUTHBOUND	131	1748	94	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	203	N/A	420	420	N/A	N/A
EASTBOUND	N/A	N/A	388	388	N/A	N/A
NORTHBOUND	171	N/A	858	858	N/A	N/A
SOUTHBOUND	131	N/A	614	614	N/A	N/A

EAST-WEST CRITICAL VOLUMES 591
NORTH-SOUTH CRITICAL VOLUMES 989

THE SUM OF CRITICAL VOLUMES 1580

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 1.049

LEVEL OF SERVICE ..... F

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	28	38	18	0
EASTBOUND	162	39	0	988
NORTHBOUND	772	2432	32	0
SOUTHBOUND	35	2276	116	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	42	N/A	42	N/A	N/A
EASTBOUND	162	N/A	39	N/A	0	N/A
NORTHBOUND	425	N/A	821	821	N/A	N/A
SOUTHBOUND	35	N/A	797	797	N/A	N/A

EAST-WEST CRITICAL VOLUMES 204
NORTH-SOUTH CRITICAL VOLUMES 1222

THE SUM OF CRITICAL VOLUMES 1426

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.901

LEVEL OF SERVICE ..... E

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	76	26	142	239
EASTBOUND	28	53	24	0
NORTHBOUND	16	1462	197	0
SOUTHBOUND	239	1626	23	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	76	N/A	N/A	84	84	N/A
EASTBOUND	N/A	52	N/A	52	N/A	N/A
NORTHBOUND	16	N/A	830	830	N/A	N/A
SOUTHBOUND	239	N/A	824	824	N/A	N/A

EAST-WEST CRITICAL VOLUMES 128
NORTH-SOUTH CRITICAL VOLUMES 1069

THE SUM OF CRITICAL VOLUMES 1197

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.740

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	412	34	392	233
EASTBOUND	38	60	17	0
NORTHBOUND	50	1074	228	0
SOUTHBOUND	466	1278	60	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	223	223	N/A	N/A	392	N/A
EASTBOUND	38	N/A	N/A	77	N/A	N/A
NORTHBOUND	50	N/A	651	651	N/A	N/A
SOUTHBOUND	466	N/A	669	669	N/A	N/A

EAST-WEST CRITICAL VOLUMES 469
NORTH-SOUTH CRITICAL VOLUMES 1117

THE SUM OF CRITICAL VOLUMES 1586

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 1.013

LEVEL OF SERVICE ..... F

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	213	0	619
EASTBOUND	225	324	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	891	0	125	225

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	213	N/A	0	N/A
EASTBOUND	225	N/A	162	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	490	N/A	N/A	N/A	125	N/A

EAST-WEST CRITICAL VOLUMES 438
NORTH-SOUTH CRITICAL VOLUMES 490

THE SUM OF CRITICAL VOLUMES 928

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.519

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	1005	81	0
EASTBOUND	52	604	0	0
NORTHBOUND	616	900	181	146
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	543	543	N/A	N/A
EASTBOUND	52	N/A	302	N/A	N/A	N/A
NORTHBOUND	505	505	505	N/A	181	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 595
NORTH-SOUTH CRITICAL VOLUMES 505

THE SUM OF CRITICAL VOLUMES 1100

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.672

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	440	1185	0	0
EASTBOUND	0	586	635	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	70	1025	41	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	440	N/A	592	N/A	N/A	N/A
EASTBOUND	N/A	N/A	407	407	407	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	70	N/A	533	533	N/A	N/A

EAST-WEST CRITICAL VOLUMES 847
NORTH-SOUTH CRITICAL VOLUMES 533

THE SUM OF CRITICAL VOLUMES 1380

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.868

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT PLUS MITIGATION

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	478	480	133
EASTBOUND	654	976	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	484	0	50	180

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	3	0	2	0	5
EASTBOUND	2	0	3	0	0	0	5
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	3	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	159	N/A	240	N/A
EASTBOUND	360	N/A	325	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	266	N/A	N/A	N/A	17	N/A

EAST-WEST CRITICAL VOLUMES 600
NORTH-SOUTH CRITICAL VOLUMES 266

THE SUM OF CRITICAL VOLUMES 866

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.508

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT PLUS MITIGATION

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	171	656	21	133
EASTBOUND	67	629	45	248
NORTHBOUND	362	495	289	85
SOUTHBOUND	60	257	9	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	171	N/A	328	N/A	21	N/A
EASTBOUND	67	N/A	314	N/A	45	N/A
NORTHBOUND	199	N/A	495	N/A	289	N/A
SOUTHBOUND	60	N/A	N/A	266	N/A	N/A

EAST-WEST CRITICAL VOLUMES 484
NORTH-SOUTH CRITICAL VOLUMES 761

THE SUM OF CRITICAL VOLUMES 1245

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.774

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT PLUS MITIGATION

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	61	705	451	63
EASTBOUND	197	1225	10	0
NORTHBOUND	52	152	31	30
SOUTHBOUND	211	42	27	114

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	1	0	0	4
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	0	1	0	2
SOUTHBOUND	1	1	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	61	N/A	352	N/A	451	N/A
EASTBOUND	197	N/A	618	618	N/A	N/A
NORTHBOUND	N/A	204	N/A	N/A	31	N/A
SOUTHBOUND	126	126	N/A	N/A	27	N/A

EAST-WEST CRITICAL VOLUMES 678
NORTH-SOUTH CRITICAL VOLUMES 330

THE SUM OF CRITICAL VOLUMES 1008

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.607

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT PLUS MITIGATION

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	223	1038	0	0
EASTBOUND	0	1052	0	90
NORTHBOUND	320	0	408	112
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	2	0	0	0	1	0	3
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	223	N/A	519	N/A	N/A	N/A
EASTBOUND	N/A	N/A	526	N/A	0	N/A
NORTHBOUND	176	N/A	N/A	N/A	408	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 749
NORTH-SOUTH CRITICAL VOLUMES 408

THE SUM OF CRITICAL VOLUMES 1157

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.671

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT PLUS MITIGATION

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	65	29	110	242
EASTBOUND	19	36	24	0
NORTHBOUND	29	1166	118	0
SOUTHBOUND	242	1720	22	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	65	N/A	N/A	70	70	N/A
EASTBOUND	N/A	40	N/A	40	N/A	N/A
NORTHBOUND	29	N/A	428	428	N/A	N/A
SOUTHBOUND	242	N/A	871	871	N/A	N/A

EAST-WEST CRITICAL VOLUMES 105
NORTH-SOUTH CRITICAL VOLUMES 900

THE SUM OF CRITICAL VOLUMES 1005

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.605

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT PLUS MITIGATION

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	152	17	220	324
EASTBOUND	22	36	25	0
NORTHBOUND	17	905	6	110
SOUTHBOUND	590	889	18	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	2	0	1	0	4
SOUTHBOUND	2	0	1	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	84	84	N/A	N/A	220	N/A
EASTBOUND	N/A	42	N/A	42	N/A	N/A
NORTHBOUND	17	N/A	452	N/A	6	N/A
SOUTHBOUND	324	N/A	454	454	N/A	N/A

EAST-WEST CRITICAL VOLUMES 262
NORTH-SOUTH CRITICAL VOLUMES 776

THE SUM OF CRITICAL VOLUMES 1038

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.655

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT PLUS MITIGATION

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	298	894	0	0
EASTBOUND	0	422	0	876
NORTHBOUND	0	0	0	0
SOUTHBOUND	34	1031	13	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	298	N/A	447	N/A	N/A	N/A
EASTBOUND	N/A	N/A	211	N/A	0	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	34	N/A	522	522	N/A	N/A

EAST-WEST CRITICAL VOLUMES 509
NORTH-SOUTH CRITICAL VOLUMES 522

THE SUM OF CRITICAL VOLUMES 1031

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.624

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT PLUS MITIGATION

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	797	0	121
EASTBOUND	407	633	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	784	0	371	112

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	3	0	2	0	5
EASTBOUND	2	0	3	0	0	0	5
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	3	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	266	N/A	0	N/A
EASTBOUND	224	N/A	211	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	431	N/A	N/A	N/A	124	N/A

EAST-WEST CRITICAL VOLUMES 490
NORTH-SOUTH CRITICAL VOLUMES 431

THE SUM OF CRITICAL VOLUMES 921

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.546

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT PLUS MITIGATION

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	256	844	0	201
EASTBOUND	35	594	334	136
NORTHBOUND	209	113	109	128
SOUTHBOUND	155	556	32	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	256	N/A	422	N/A	0	N/A
EASTBOUND	35	N/A	297	N/A	334	N/A
NORTHBOUND	115	N/A	113	N/A	109	N/A
SOUTHBOUND	155	N/A	N/A	588	N/A	N/A

EAST-WEST CRITICAL VOLUMES 590
NORTH-SOUTH CRITICAL VOLUMES 703

THE SUM OF CRITICAL VOLUMES 1293

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.807

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT PLUS MITIGATION

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	104	1077	428	0
EASTBOUND	114	1224	35	0
NORTHBOUND	38	56	0	52
SOUTHBOUND	459	44	128	116

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	1	0	0	4
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	0	1	0	2
SOUTHBOUND	1	1	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	104	N/A	502	502	N/A	N/A
EASTBOUND	114	N/A	630	630	N/A	N/A
NORTHBOUND	N/A	94	N/A	N/A	0	N/A
SOUTHBOUND	252	252	N/A	N/A	128	N/A

EAST-WEST CRITICAL VOLUMES 734
NORTH-SOUTH CRITICAL VOLUMES 346

THE SUM OF CRITICAL VOLUMES 1080

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.658

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT PLUS MITIGATION

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	481	1195	0	0
EASTBOUND	0	1145	61	88
NORTHBOUND	320	0	59	240
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	2	0	0	0	1	0	3
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	481	N/A	598	N/A	N/A	N/A
EASTBOUND	N/A	N/A	572	N/A	61	N/A
NORTHBOUND	176	N/A	N/A	N/A	59	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 1053
NORTH-SOUTH CRITICAL VOLUMES 176

THE SUM OF CRITICAL VOLUMES 1229

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.719

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT PLUS MITIGATION

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	76	26	142	239
EASTBOUND	28	53	24	0
NORTHBOUND	16	1462	197	0
SOUTHBOUND	239	1626	23	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	76	N/A	N/A	84	84	N/A
EASTBOUND	N/A	52	N/A	52	N/A	N/A
NORTHBOUND	16	N/A	553	553	N/A	N/A
SOUTHBOUND	239	N/A	824	824	N/A	N/A

EAST-WEST CRITICAL VOLUMES 128
NORTH-SOUTH CRITICAL VOLUMES 840

THE SUM OF CRITICAL VOLUMES 968

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.579

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT PLUS MITIGATION

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	412	34	369	256
EASTBOUND	38	60	17	0
NORTHBOUND	50	1074	44	184
SOUTHBOUND	466	1278	60	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	2	0	1	0	4
SOUTHBOUND	2	0	1	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	223	223	N/A	N/A	369	N/A
EASTBOUND	N/A	58	N/A	58	N/A	N/A
NORTHBOUND	50	N/A	537	N/A	44	N/A
SOUTHBOUND	256	N/A	669	669	N/A	N/A

EAST-WEST CRITICAL VOLUMES 427
NORTH-SOUTH CRITICAL VOLUMES 793

THE SUM OF CRITICAL VOLUMES 1220

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.787

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 12/3/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) WITH CUMULATIVE DEVELOPMENT PLUS MITIGATION

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	440	1185	0	0
EASTBOUND	0	586	0	635
NORTHBOUND	0	0	0	0
SOUTHBOUND	70	1025	41	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	440	N/A	592	N/A	N/A	N/A
EASTBOUND	N/A	N/A	293	N/A	0	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	70	N/A	533	533	N/A	N/A

EAST-WEST CRITICAL VOLUMES 733
NORTH-SOUTH CRITICAL VOLUMES 533

THE SUM OF CRITICAL VOLUMES 1266

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.788

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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Future (2013) With Ambient Growth Plus Project
(Residential Development on Parcel 10R Only)

CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	15	1	125	38
EASTBOUND	0	0	0	0
NORTHBOUND	2	623	6	0
SOUTHBOUND	76	244	15	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	16	N/A	N/A	125	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	315	N/A	316	N/A	N/A
SOUTHBOUND	76	N/A	130	130	N/A	N/A

EAST-WEST CRITICAL VOLUMES 125
NORTH-SOUTH CRITICAL VOLUMES 392

THE SUM OF CRITICAL VOLUMES 517

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.276

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	3	24	125	26
EASTBOUND	151	12	0	19
NORTHBOUND	66	721	9	0
SOUTHBOUND	51	317	32	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	27	N/A	N/A	125	N/A
EASTBOUND	151	N/A	12	N/A	0	N/A
NORTHBOUND	66	N/A	243	243	N/A	N/A
SOUTHBOUND	51	N/A	116	116	N/A	N/A

EAST-WEST CRITICAL VOLUMES 276
NORTH-SOUTH CRITICAL VOLUMES 294

THE SUM OF CRITICAL VOLUMES 570

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.304

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	19	0	159	63
EASTBOUND	77	2	0	0
NORTHBOUND	5	993	16	0
SOUTHBOUND	126	365	24	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	19	N/A	N/A	159	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	79
NORTHBOUND	5	N/A	336	336	N/A	N/A
SOUTHBOUND	126	N/A	130	130	N/A	N/A

EAST-WEST CRITICAL VOLUMES 236
NORTH-SOUTH CRITICAL VOLUMES 462

THE SUM OF CRITICAL VOLUMES 698

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.372

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	371	0	867	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	610	0	705
SOUTHBOUND	457	169	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	204	N/A	N/A	N/A	434	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	305	N/A	0	N/A
SOUTHBOUND	457	N/A	56	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 434
NORTH-SOUTH CRITICAL VOLUMES 762

THE SUM OF CRITICAL VOLUMES 1196

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.739

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	126	409	0	33
EASTBOUND	66	579	0	271
NORTHBOUND	520	554	304	63
SOUTHBOUND	58	237	9	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	126	N/A	204	N/A	0	N/A
EASTBOUND	66	N/A	290	N/A	0	N/A
NORTHBOUND	286	N/A	554	N/A	304	N/A
SOUTHBOUND	58	N/A	N/A	246	N/A	N/A

EAST-WEST CRITICAL VOLUMES 416
NORTH-SOUTH CRITICAL VOLUMES 800

THE SUM OF CRITICAL VOLUMES 1216

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.753

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	42	854	83	0
EASTBOUND	103	985	6	0
NORTHBOUND	42	81	61	0
SOUTHBOUND	157	28	30	52

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	42	N/A	468	468	N/A	N/A
EASTBOUND	103	N/A	496	496	N/A	N/A
NORTHBOUND	N/A	92	N/A	92	N/A	N/A
SOUTHBOUND	157	N/A	28	N/A	30	N/A

EAST-WEST CRITICAL VOLUMES 571
NORTH-SOUTH CRITICAL VOLUMES 249

THE SUM OF CRITICAL VOLUMES 820

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.447

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	130	944	0	0
EASTBOUND	0	998	0	82
NORTHBOUND	0	0	179	65
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	130	N/A	472	N/A	N/A	N/A
EASTBOUND	N/A	N/A	499	N/A	0	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	179	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 629
NORTH-SOUTH CRITICAL VOLUMES 179

THE SUM OF CRITICAL VOLUMES 808

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.673

LEVEL OF SERVICE ..... B

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	180	546	53	145
EASTBOUND	174	763	208	236
NORTHBOUND	430	1492	244	0
SOUTHBOUND	264	1434	174	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	99	N/A	273	N/A	53	N/A
EASTBOUND	96	N/A	382	N/A	208	N/A
NORTHBOUND	236	N/A	579	579	N/A	N/A
SOUTHBOUND	145	N/A	536	536	N/A	N/A

EAST-WEST CRITICAL VOLUMES 481
NORTH-SOUTH CRITICAL VOLUMES 772

THE SUM OF CRITICAL VOLUMES 1253

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.811

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	146	0	0	779
EASTBOUND	0	0	0	0
NORTHBOUND	0	1871	124	0
SOUTHBOUND	736	1293	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	80	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	665	665	N/A	N/A
SOUTHBOUND	405	N/A	431	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 80
NORTH-SOUTH CRITICAL VOLUMES 1070

THE SUM OF CRITICAL VOLUMES 1150

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.707

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	8	7	37	0
EASTBOUND	250	1	0	47
NORTHBOUND	166	2583	9	0
SOUTHBOUND	27	1328	162	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	52
EASTBOUND	126	126	N/A	N/A	0	N/A
NORTHBOUND	166	N/A	864	864	N/A	N/A
SOUTHBOUND	27	N/A	497	497	N/A	N/A

EAST-WEST CRITICAL VOLUMES 178
NORTH-SOUTH CRITICAL VOLUMES 891

THE SUM OF CRITICAL VOLUMES 1069

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.677

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	231	406	62	0
EASTBOUND	0	440	43	0
NORTHBOUND	156	1957	319	0
SOUTHBOUND	62	1147	44	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	127	N/A	234	234	N/A	N/A
EASTBOUND	N/A	N/A	242	242	N/A	N/A
NORTHBOUND	156	N/A	759	759	N/A	N/A
SOUTHBOUND	62	N/A	397	397	N/A	N/A

EAST-WEST CRITICAL VOLUMES 369
NORTH-SOUTH CRITICAL VOLUMES 821

THE SUM OF CRITICAL VOLUMES 1190

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.765

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	15	23	23	0
EASTBOUND	75	18	0	651
NORTHBOUND	797	2242	33	0
SOUTHBOUND	45	1384	39	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	30	N/A	30	N/A	N/A
EASTBOUND	75	N/A	18	N/A	0	N/A
NORTHBOUND	438	N/A	758	758	N/A	N/A
SOUTHBOUND	45	N/A	474	474	N/A	N/A

EAST-WEST CRITICAL VOLUMES 105
NORTH-SOUTH CRITICAL VOLUMES 912

THE SUM OF CRITICAL VOLUMES 1017

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.614

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	57	29	149	173
EASTBOUND	19	36	24	0
NORTHBOUND	28	997	104	0
SOUTHBOUND	173	1385	21	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	57	N/A	N/A	89	89	N/A
EASTBOUND	N/A	40	N/A	40	N/A	N/A
NORTHBOUND	28	N/A	550	550	N/A	N/A
SOUTHBOUND	173	N/A	703	703	N/A	N/A

EAST-WEST CRITICAL VOLUMES 108
NORTH-SOUTH CRITICAL VOLUMES 731

THE SUM OF CRITICAL VOLUMES 839

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.489

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	125	17	262	160
EASTBOUND	22	36	25	0
NORTHBOUND	16	845	66	0
SOUTHBOUND	321	817	17	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	71	71	N/A	N/A	262	N/A
EASTBOUND	22	N/A	N/A	61	N/A	N/A
NORTHBOUND	16	N/A	456	456	N/A	N/A
SOUTHBOUND	321	N/A	417	417	N/A	N/A

EAST-WEST CRITICAL VOLUMES 323
NORTH-SOUTH CRITICAL VOLUMES 777

THE SUM OF CRITICAL VOLUMES 1100

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.672

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	89	0	744
EASTBOUND	91	108	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	588	0	0	75

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	89	N/A	0	N/A
EASTBOUND	91	N/A	54	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	323	N/A	N/A	N/A	0	N/A

EAST-WEST CRITICAL VOLUMES 180
NORTH-SOUTH CRITICAL VOLUMES 323

THE SUM OF CRITICAL VOLUMES 503

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.268

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	653	26	0
EASTBOUND	11	412	0	0
NORTHBOUND	386	787	210	72
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	340	340	N/A	N/A
EASTBOUND	11	N/A	206	N/A	N/A	N/A
NORTHBOUND	386	N/A	394	N/A	210	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 351
NORTH-SOUTH CRITICAL VOLUMES 394

THE SUM OF CRITICAL VOLUMES 745

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.423

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	277	761	0	0
EASTBOUND	0	400	571	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	24	917	13	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	277	N/A	380	N/A	N/A	N/A
EASTBOUND	N/A	N/A	324	324	324	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	24	N/A	465	465	N/A	N/A

EAST-WEST CRITICAL VOLUMES 601
NORTH-SOUTH CRITICAL VOLUMES 465

THE SUM OF CRITICAL VOLUMES 1066

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.648

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	7	0	8	68
EASTBOUND	0	0	0	0
NORTHBOUND	3	360	15	0
SOUTHBOUND	137	441	17	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	7	N/A	N/A	8	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	187	N/A	191	N/A	N/A
SOUTHBOUND	137	N/A	229	229	N/A	N/A

EAST-WEST CRITICAL VOLUMES 8
NORTH-SOUTH CRITICAL VOLUMES 328

THE SUM OF CRITICAL VOLUMES 336

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.179

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	1	9	22	69
EASTBOUND	86	21	9	28
NORTHBOUND	25	427	9	0
SOUTHBOUND	138	609	72	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	10	N/A	N/A	22	N/A
EASTBOUND	86	N/A	21	N/A	9	N/A
NORTHBOUND	25	N/A	145	145	N/A	N/A
SOUTHBOUND	138	N/A	227	227	N/A	N/A

EAST-WEST CRITICAL VOLUMES 108
NORTH-SOUTH CRITICAL VOLUMES 283

THE SUM OF CRITICAL VOLUMES 391

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.209

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	13	1	58	102
EASTBOUND	35	3	5	0
NORTHBOUND	5	596	23	0
SOUTHBOUND	203	777	31	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	14	N/A	N/A	58	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	43
NORTHBOUND	5	N/A	206	206	N/A	N/A
SOUTHBOUND	203	N/A	269	269	N/A	N/A

EAST-WEST CRITICAL VOLUMES 93
NORTH-SOUTH CRITICAL VOLUMES 409

THE SUM OF CRITICAL VOLUMES 502

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.268

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	627	0	387	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	377	0	454
SOUTHBOUND	750	382	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	345	N/A	N/A	N/A	194	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	188	N/A	0	N/A
SOUTHBOUND	750	N/A	127	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 345
NORTH-SOUTH CRITICAL VOLUMES 938

THE SUM OF CRITICAL VOLUMES 1283

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.800

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	190	598	0	38
EASTBOUND	34	505	324	122
NORTHBOUND	335	244	122	95
SOUTHBOUND	152	512	30	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	190	N/A	299	N/A	0	N/A
EASTBOUND	34	N/A	252	N/A	324	N/A
NORTHBOUND	184	N/A	244	N/A	122	N/A
SOUTHBOUND	152	N/A	N/A	542	N/A	N/A

EAST-WEST CRITICAL VOLUMES 514
NORTH-SOUTH CRITICAL VOLUMES 786

THE SUM OF CRITICAL VOLUMES 1300

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.812

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	102	1177	75	0
EASTBOUND	42	1063	34	0
NORTHBOUND	34	40	48	0
SOUTHBOUND	379	48	193	21

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	102	N/A	626	626	N/A	N/A
EASTBOUND	42	N/A	548	548	N/A	N/A
NORTHBOUND	N/A	58	N/A	64	N/A	N/A
SOUTHBOUND	379	N/A	48	N/A	193	N/A

EAST-WEST CRITICAL VOLUMES 668
NORTH-SOUTH CRITICAL VOLUMES 443

THE SUM OF CRITICAL VOLUMES 1111

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.641

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	378	1038	0	0
EASTBOUND	0	1047	134	0
NORTHBOUND	0	0	0	178
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	378	N/A	519	N/A	N/A	N/A
EASTBOUND	N/A	N/A	524	N/A	134	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	0	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 902
NORTH-SOUTH CRITICAL VOLUMES 0

THE SUM OF CRITICAL VOLUMES 902

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.752

LEVEL OF SERVICE C

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	504	988	145	264
EASTBOUND	307	1120	314	377
NORTHBOUND	686	1578	344	0
SOUTHBOUND	480	2312	201	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	277	N/A	494	N/A	145	N/A
EASTBOUND	169	N/A	560	N/A	314	N/A
NORTHBOUND	377	N/A	641	641	N/A	N/A
SOUTHBOUND	264	N/A	838	838	N/A	N/A

EAST-WEST CRITICAL VOLUMES 837
NORTH-SOUTH CRITICAL VOLUMES 1215

THE SUM OF CRITICAL VOLUMES 2052

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 1.392

LEVEL OF SERVICE ..... F

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	185	0	0	667
EASTBOUND	0	0	0	0
NORTHBOUND	0	1900	167	0
SOUTHBOUND	767	1806	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	102	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	689	689	N/A	N/A
SOUTHBOUND	422	N/A	602	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 102
NORTH-SOUTH CRITICAL VOLUMES 1111

THE SUM OF CRITICAL VOLUMES 1213

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.751

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	16	1	34	0
EASTBOUND	311	2	0	51
NORTHBOUND	85	1542	15	0
SOUTHBOUND	7	1433	311	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	51
EASTBOUND	156	156	N/A	N/A	0	N/A
NORTHBOUND	85	N/A	519	519	N/A	N/A
SOUTHBOUND	7	N/A	581	581	N/A	N/A

EAST-WEST CRITICAL VOLUMES 207
NORTH-SOUTH CRITICAL VOLUMES 666

THE SUM OF CRITICAL VOLUMES 873

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.535

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	361	575	56	0
EASTBOUND	0	496	97	0
NORTHBOUND	144	1880	344	0
SOUTHBOUND	123	1458	94	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	198	N/A	316	316	N/A	N/A
EASTBOUND	N/A	N/A	296	296	N/A	N/A
NORTHBOUND	144	N/A	741	741	N/A	N/A
SOUTHBOUND	123	N/A	517	517	N/A	N/A

EAST-WEST CRITICAL VOLUMES 494
NORTH-SOUTH CRITICAL VOLUMES 864

THE SUM OF CRITICAL VOLUMES 1358

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.888

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	28	38	18	0
EASTBOUND	125	39	0	892
NORTHBOUND	680	2093	32	0
SOUTHBOUND	35	1998	76	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	42	N/A	42	N/A	N/A
EASTBOUND	125	N/A	39	N/A	0	N/A
NORTHBOUND	374	N/A	708	708	N/A	N/A
SOUTHBOUND	35	N/A	691	691	N/A	N/A

EAST-WEST CRITICAL VOLUMES 167
NORTH-SOUTH CRITICAL VOLUMES 1065

THE SUM OF CRITICAL VOLUMES 1232

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.765

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	56	23	140	209
EASTBOUND	27	51	20	0
NORTHBOUND	16	1225	178	0
SOUTHBOUND	209	1429	23	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	56	N/A	N/A	82	82	N/A
EASTBOUND	N/A	49	N/A	49	N/A	N/A
NORTHBOUND	16	N/A	702	702	N/A	N/A
SOUTHBOUND	209	N/A	726	726	N/A	N/A

EAST-WEST CRITICAL VOLUMES 109
NORTH-SOUTH CRITICAL VOLUMES 911

THE SUM OF CRITICAL VOLUMES 1020

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.616

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	343	34	291	168
EASTBOUND	37	60	11	0
NORTHBOUND	50	984	175	0
SOUTHBOUND	336	1187	60	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	188	188	N/A	N/A	291	N/A
EASTBOUND	37	N/A	N/A	71	N/A	N/A
NORTHBOUND	50	N/A	580	580	N/A	N/A
SOUTHBOUND	336	N/A	624	624	N/A	N/A

EAST-WEST CRITICAL VOLUMES 362
NORTH-SOUTH CRITICAL VOLUMES 916

THE SUM OF CRITICAL VOLUMES 1278

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.797

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	132	0	570
EASTBOUND	133	246	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	837	0	105	133

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	132	N/A	0	N/A
EASTBOUND	133	N/A	123	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	460	N/A	N/A	N/A	105	N/A

EAST-WEST CRITICAL VOLUMES 265
NORTH-SOUTH CRITICAL VOLUMES 460

THE SUM OF CRITICAL VOLUMES 725

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.387

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	978	64	0
EASTBOUND	39	569	0	0
NORTHBOUND	419	725	172	138
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	521	521	N/A	N/A
EASTBOUND	39	N/A	284	N/A	N/A	N/A
NORTHBOUND	381	381	381	N/A	172	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 560
NORTH-SOUTH CRITICAL VOLUMES 381

THE SUM OF CRITICAL VOLUMES 941

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.560

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, RESIDENTIAL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	433	965	0	0
EASTBOUND	0	550	472	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	58	896	41	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	433	N/A	482	N/A	N/A	N/A
EASTBOUND	N/A	N/A	341	341	341	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	58	N/A	468	468	N/A	N/A

EAST-WEST CRITICAL VOLUMES 774
NORTH-SOUTH CRITICAL VOLUMES 468

THE SUM OF CRITICAL VOLUMES 1242

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.772

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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Future (2013) With Ambient Growth Plus Project

(Parcel FF Only)

CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	15	1	125	38
EASTBOUND	0	0	0	0
NORTHBOUND	2	623	6	0
SOUTHBOUND	76	243	15	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	16	N/A	N/A	125	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	315	N/A	316	N/A	N/A
SOUTHBOUND	76	N/A	129	129	N/A	N/A

EAST-WEST CRITICAL VOLUMES 125
NORTH-SOUTH CRITICAL VOLUMES 392

THE SUM OF CRITICAL VOLUMES 517

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.276

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	3	23	110	24
EASTBOUND	151	12	0	19
NORTHBOUND	65	700	9	0
SOUTHBOUND	47	312	32	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	26	N/A	N/A	110	N/A
EASTBOUND	151	N/A	12	N/A	0	N/A
NORTHBOUND	65	N/A	236	236	N/A	N/A
SOUTHBOUND	47	N/A	115	115	N/A	N/A

EAST-WEST CRITICAL VOLUMES 261
NORTH-SOUTH CRITICAL VOLUMES 283

THE SUM OF CRITICAL VOLUMES 544

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.290

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	19	0	159	63
EASTBOUND	77	2	0	0
NORTHBOUND	5	955	16	0
SOUTHBOUND	126	356	24	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	19	N/A	N/A	159	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	79
NORTHBOUND	5	N/A	324	324	N/A	N/A
SOUTHBOUND	126	N/A	127	127	N/A	N/A

EAST-WEST CRITICAL VOLUMES 236
NORTH-SOUTH CRITICAL VOLUMES 450

THE SUM OF CRITICAL VOLUMES 686

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.366

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	365	0	867	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	597	0	680
SOUTHBOUND	457	166	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	201	N/A	N/A	N/A	434	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	298	N/A	0	N/A
SOUTHBOUND	457	N/A	55	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 434
NORTH-SOUTH CRITICAL VOLUMES 755

THE SUM OF CRITICAL VOLUMES 1189

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.734

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	124	409	0	33
EASTBOUND	66	579	0	270
NORTHBOUND	519	550	297	62
SOUTHBOUND	58	236	9	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	124	N/A	204	N/A	0	N/A
EASTBOUND	66	N/A	290	N/A	0	N/A
NORTHBOUND	285	N/A	550	N/A	297	N/A
SOUTHBOUND	58	N/A	N/A	245	N/A	N/A

EAST-WEST CRITICAL VOLUMES 414
NORTH-SOUTH CRITICAL VOLUMES 795

THE SUM OF CRITICAL VOLUMES 1209

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.748

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	42	849	83	0
EASTBOUND	103	960	6	0
NORTHBOUND	42	81	61	0
SOUTHBOUND	157	28	29	52

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	42	N/A	466	466	N/A	N/A
EASTBOUND	103	N/A	483	483	N/A	N/A
NORTHBOUND	N/A	92	N/A	92	N/A	N/A
SOUTHBOUND	157	N/A	28	N/A	29	N/A

EAST-WEST CRITICAL VOLUMES 569
NORTH-SOUTH CRITICAL VOLUMES 249

THE SUM OF CRITICAL VOLUMES 818

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.445

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	129	942	0	0
EASTBOUND	0	990	0	82
NORTHBOUND	0	0	180	64
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	129	N/A	471	N/A	N/A	N/A
EASTBOUND	N/A	N/A	495	N/A	0	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	180	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 624
NORTH-SOUTH CRITICAL VOLUMES 180

THE SUM OF CRITICAL VOLUMES 804

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.670

LEVEL OF SERVICE ..... B

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	180	544	53	145
EASTBOUND	172	757	208	236
NORTHBOUND	430	1492	244	0
SOUTHBOUND	264	1434	173	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	99	N/A	272	N/A	53	N/A
EASTBOUND	95	N/A	378	N/A	208	N/A
NORTHBOUND	236	N/A	579	579	N/A	N/A
SOUTHBOUND	145	N/A	536	536	N/A	N/A

EAST-WEST CRITICAL VOLUMES 477
NORTH-SOUTH CRITICAL VOLUMES 772

THE SUM OF CRITICAL VOLUMES 1249

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.808

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	146	0	0	779
EASTBOUND	0	0	0	0
NORTHBOUND	0	1871	124	0
SOUTHBOUND	736	1293	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	80	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	665	665	N/A	N/A
SOUTHBOUND	405	N/A	431	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 80
NORTH-SOUTH CRITICAL VOLUMES 1070

THE SUM OF CRITICAL VOLUMES 1150

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.707

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	8	7	37	0
EASTBOUND	250	1	0	46
NORTHBOUND	166	2583	9	0
SOUTHBOUND	27	1328	162	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	52
EASTBOUND	126	126	N/A	N/A	0	N/A
NORTHBOUND	166	N/A	864	864	N/A	N/A
SOUTHBOUND	27	N/A	497	497	N/A	N/A

EAST-WEST CRITICAL VOLUMES 178
NORTH-SOUTH CRITICAL VOLUMES 891

THE SUM OF CRITICAL VOLUMES 1069

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.677

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	231	403	62	0
EASTBOUND	0	424	42	0
NORTHBOUND	155	1957	319	0
SOUTHBOUND	62	1146	44	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	127	N/A	232	232	N/A	N/A
EASTBOUND	N/A	N/A	233	233	N/A	N/A
NORTHBOUND	155	N/A	759	759	N/A	N/A
SOUTHBOUND	62	N/A	397	397	N/A	N/A

EAST-WEST CRITICAL VOLUMES 360
NORTH-SOUTH CRITICAL VOLUMES 821

THE SUM OF CRITICAL VOLUMES 1181

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.759

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	15	23	23	0
EASTBOUND	75	18	0	647
NORTHBOUND	797	2241	33	0
SOUTHBOUND	45	1382	39	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	30	N/A	30	N/A	N/A
EASTBOUND	75	N/A	18	N/A	0	N/A
NORTHBOUND	438	N/A	758	758	N/A	N/A
SOUTHBOUND	45	N/A	474	474	N/A	N/A

EAST-WEST CRITICAL VOLUMES 105
NORTH-SOUTH CRITICAL VOLUMES 912

THE SUM OF CRITICAL VOLUMES 1017

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.614

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	57	29	150	172
EASTBOUND	19	36	24	0
NORTHBOUND	28	992	104	0
SOUTHBOUND	172	1362	20	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	57	N/A	N/A	90	90	N/A
EASTBOUND	N/A	40	N/A	40	N/A	N/A
NORTHBOUND	28	N/A	548	548	N/A	N/A
SOUTHBOUND	172	N/A	691	691	N/A	N/A

EAST-WEST CRITICAL VOLUMES 109
NORTH-SOUTH CRITICAL VOLUMES 720

THE SUM OF CRITICAL VOLUMES 829

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.482

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	125	17	266	152
EASTBOUND	22	36	25	0
NORTHBOUND	16	844	66	0
SOUTHBOUND	304	812	16	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	71	71	N/A	N/A	266	N/A
EASTBOUND	22	N/A	N/A	61	N/A	N/A
NORTHBOUND	16	N/A	455	455	N/A	N/A
SOUTHBOUND	304	N/A	414	414	N/A	N/A

EAST-WEST CRITICAL VOLUMES 327
NORTH-SOUTH CRITICAL VOLUMES 759

THE SUM OF CRITICAL VOLUMES 1086

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.662

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	89	0	744
EASTBOUND	90	108	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	584	0	0	74

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	89	N/A	0	N/A
EASTBOUND	90	N/A	54	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	321	N/A	N/A	N/A	0	N/A

EAST-WEST CRITICAL VOLUMES 179
NORTH-SOUTH CRITICAL VOLUMES 321

THE SUM OF CRITICAL VOLUMES 500

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.267

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	653	26	0
EASTBOUND	11	412	0	0
NORTHBOUND	383	787	210	72
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	340	340	N/A	N/A
EASTBOUND	11	N/A	206	N/A	N/A	N/A
NORTHBOUND	383	N/A	394	N/A	210	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 351
NORTH-SOUTH CRITICAL VOLUMES 394

THE SUM OF CRITICAL VOLUMES 745

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.423

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	277	758	0	0
EASTBOUND	0	400	555	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	24	917	13	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	277	N/A	379	N/A	N/A	N/A
EASTBOUND	N/A	N/A	318	318	318	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	24	N/A	465	465	N/A	N/A

EAST-WEST CRITICAL VOLUMES 595
NORTH-SOUTH CRITICAL VOLUMES 465

THE SUM OF CRITICAL VOLUMES 1060

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.644

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	7	0	8	68
EASTBOUND	0	0	0	0
NORTHBOUND	3	360	15	0
SOUTHBOUND	137	440	17	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	7	N/A	N/A	8	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	187	N/A	191	N/A	N/A
SOUTHBOUND	137	N/A	228	228	N/A	N/A

EAST-WEST CRITICAL VOLUMES 8
NORTH-SOUTH CRITICAL VOLUMES 328

THE SUM OF CRITICAL VOLUMES 336

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.179

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	1	9	22	63
EASTBOUND	86	20	12	24
NORTHBOUND	25	419	9	0
SOUTHBOUND	126	592	72	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	10	N/A	N/A	22	N/A
EASTBOUND	86	N/A	20	N/A	12	N/A
NORTHBOUND	25	N/A	143	143	N/A	N/A
SOUTHBOUND	126	N/A	221	221	N/A	N/A

EAST-WEST CRITICAL VOLUMES 108
NORTH-SOUTH CRITICAL VOLUMES 269

THE SUM OF CRITICAL VOLUMES 377

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.201

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	13	1	58	102
EASTBOUND	35	3	5	0
NORTHBOUND	5	582	23	0
SOUTHBOUND	203	748	31	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	14	N/A	N/A	58	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	43
NORTHBOUND	5	N/A	202	202	N/A	N/A
SOUTHBOUND	203	N/A	260	260	N/A	N/A

EAST-WEST CRITICAL VOLUMES 93
NORTH-SOUTH CRITICAL VOLUMES 405

THE SUM OF CRITICAL VOLUMES 498

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.266

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	607	0	387	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	372	0	445
SOUTHBOUND	750	373	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	334	N/A	N/A	N/A	194	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	186	N/A	0	N/A
SOUTHBOUND	750	N/A	124	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 334
NORTH-SOUTH CRITICAL VOLUMES 936

THE SUM OF CRITICAL VOLUMES 1270

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.791

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	185	598	0	38
EASTBOUND	34	505	324	121
NORTHBOUND	334	242	123	92
SOUTHBOUND	152	509	30	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	185	N/A	299	N/A	0	N/A
EASTBOUND	34	N/A	252	N/A	324	N/A
NORTHBOUND	184	N/A	242	N/A	123	N/A
SOUTHBOUND	152	N/A	N/A	539	N/A	N/A

EAST-WEST CRITICAL VOLUMES 508
NORTH-SOUTH CRITICAL VOLUMES 781

THE SUM OF CRITICAL VOLUMES 1289

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.805

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	102	1159	75	0
EASTBOUND	42	1054	34	0
NORTHBOUND	34	40	48	0
SOUTHBOUND	379	48	191	21

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	102	N/A	617	617	N/A	N/A
EASTBOUND	42	N/A	544	544	N/A	N/A
NORTHBOUND	N/A	58	N/A	64	N/A	N/A
SOUTHBOUND	379	N/A	48	N/A	191	N/A

EAST-WEST CRITICAL VOLUMES 659
NORTH-SOUTH CRITICAL VOLUMES 443

THE SUM OF CRITICAL VOLUMES 1102

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.635

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	376	1033	0	0
EASTBOUND	0	1045	134	0
NORTHBOUND	0	0	0	178
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	376	N/A	516	N/A	N/A	N/A
EASTBOUND	N/A	N/A	522	N/A	134	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	0	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 898
NORTH-SOUTH CRITICAL VOLUMES 0

THE SUM OF CRITICAL VOLUMES 898

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.748

LEVEL OF SERVICE C

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	504	983	145	264
EASTBOUND	307	1118	314	377
NORTHBOUND	686	1578	344	0
SOUTHBOUND	480	2312	199	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	277	N/A	492	N/A	145	N/A
EASTBOUND	169	N/A	559	N/A	314	N/A
NORTHBOUND	377	N/A	641	641	N/A	N/A
SOUTHBOUND	264	N/A	837	837	N/A	N/A

EAST-WEST CRITICAL VOLUMES 836
NORTH-SOUTH CRITICAL VOLUMES 1214

THE SUM OF CRITICAL VOLUMES 2050

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 1.391

LEVEL OF SERVICE ..... F

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	185	0	0	667
EASTBOUND	0	0	0	0
NORTHBOUND	0	1900	167	0
SOUTHBOUND	767	1806	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	102	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	689	689	N/A	N/A
SOUTHBOUND	422	N/A	602	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 102
NORTH-SOUTH CRITICAL VOLUMES 1111

THE SUM OF CRITICAL VOLUMES 1213

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.751

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	16	1	34	0
EASTBOUND	311	2	0	50
NORTHBOUND	85	1542	15	0
SOUTHBOUND	7	1433	311	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	51
EASTBOUND	156	156	N/A	N/A	0	N/A
NORTHBOUND	85	N/A	519	519	N/A	N/A
SOUTHBOUND	7	N/A	581	581	N/A	N/A

EAST-WEST CRITICAL VOLUMES 207
NORTH-SOUTH CRITICAL VOLUMES 666

THE SUM OF CRITICAL VOLUMES 873

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.535

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	361	563	56	0
EASTBOUND	0	490	97	0
NORTHBOUND	143	1880	344	0
SOUTHBOUND	123	1457	94	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	199	N/A	310	310	N/A	N/A
EASTBOUND	N/A	N/A	294	294	N/A	N/A
NORTHBOUND	143	N/A	741	741	N/A	N/A
SOUTHBOUND	123	N/A	517	517	N/A	N/A

EAST-WEST CRITICAL VOLUMES 493
NORTH-SOUTH CRITICAL VOLUMES 864

THE SUM OF CRITICAL VOLUMES 1357

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.887

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	28	38	18	0
EASTBOUND	125	39	0	891
NORTHBOUND	677	2092	32	0
SOUTHBOUND	35	1997	76	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	42	N/A	42	N/A	N/A
EASTBOUND	125	N/A	39	N/A	0	N/A
NORTHBOUND	372	N/A	708	708	N/A	N/A
SOUTHBOUND	35	N/A	691	691	N/A	N/A

EAST-WEST CRITICAL VOLUMES 167
NORTH-SOUTH CRITICAL VOLUMES 1063

THE SUM OF CRITICAL VOLUMES 1230

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.763

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	56	23	141	208
EASTBOUND	26	51	20	0
NORTHBOUND	16	1208	178	0
SOUTHBOUND	208	1421	23	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	56	N/A	N/A	82	82	N/A
EASTBOUND	N/A	48	N/A	48	N/A	N/A
NORTHBOUND	16	N/A	693	693	N/A	N/A
SOUTHBOUND	208	N/A	722	722	N/A	N/A

EAST-WEST CRITICAL VOLUMES 108
NORTH-SOUTH CRITICAL VOLUMES 901

THE SUM OF CRITICAL VOLUMES 1009

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.608

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	343	34	281	165
EASTBOUND	36	60	11	0
NORTHBOUND	50	981	175	0
SOUTHBOUND	330	1185	60	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	188	188	N/A	N/A	281	N/A
EASTBOUND	36	N/A	N/A	71	N/A	N/A
NORTHBOUND	50	N/A	578	578	N/A	N/A
SOUTHBOUND	330	N/A	622	622	N/A	N/A

EAST-WEST CRITICAL VOLUMES 352
NORTH-SOUTH CRITICAL VOLUMES 908

THE SUM OF CRITICAL VOLUMES 1260

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.784

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	132	0	567
EASTBOUND	133	246	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	836	0	104	133

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	132	N/A	0	N/A
EASTBOUND	133	N/A	123	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	460	N/A	N/A	N/A	104	N/A

EAST-WEST CRITICAL VOLUMES 265
NORTH-SOUTH CRITICAL VOLUMES 460

THE SUM OF CRITICAL VOLUMES 725

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.387

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	978	64	0
EASTBOUND	39	569	0	0
NORTHBOUND	407	725	172	138
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	521	521	N/A	N/A
EASTBOUND	39	N/A	284	N/A	N/A	N/A
NORTHBOUND	377	377	377	N/A	172	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 560
NORTH-SOUTH CRITICAL VOLUMES 377

THE SUM OF CRITICAL VOLUMES 937

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.558

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL FF)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	433	953	0	0
EASTBOUND	0	550	466	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	58	896	41	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	433	N/A	476	N/A	N/A	N/A
EASTBOUND	N/A	N/A	339	339	339	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	58	N/A	468	468	N/A	N/A

EAST-WEST CRITICAL VOLUMES 772
NORTH-SOUTH CRITICAL VOLUMES 468

THE SUM OF CRITICAL VOLUMES 1240

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.770

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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Future (2013) With Ambient Growth Plus Project

(Hotel Development on Parcel 9U Only)

CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	15	1	125	38
EASTBOUND	0	0	0	0
NORTHBOUND	2	623	6	0
SOUTHBOUND	76	242	15	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	16	N/A	N/A	125	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	315	N/A	316	N/A	N/A
SOUTHBOUND	76	N/A	128	128	N/A	N/A

EAST-WEST CRITICAL VOLUMES 125
NORTH-SOUTH CRITICAL VOLUMES 392

THE SUM OF CRITICAL VOLUMES 517

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.276

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	2	21	81	20
EASTBOUND	151	11	0	19
NORTHBOUND	65	754	9	0
SOUTHBOUND	40	375	32	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	23	N/A	N/A	81	N/A
EASTBOUND	151	N/A	11	N/A	0	N/A
NORTHBOUND	65	N/A	254	254	N/A	N/A
SOUTHBOUND	40	N/A	136	136	N/A	N/A

EAST-WEST CRITICAL VOLUMES 232
NORTH-SOUTH CRITICAL VOLUMES 294

THE SUM OF CRITICAL VOLUMES 526

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.281

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	19	0	159	63
EASTBOUND	77	2	0	0
NORTHBOUND	5	976	16	0
SOUTHBOUND	126	412	24	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	19	N/A	N/A	159	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	79
NORTHBOUND	5	N/A	331	331	N/A	N/A
SOUTHBOUND	126	N/A	145	145	N/A	N/A

EAST-WEST CRITICAL VOLUMES 236
NORTH-SOUTH CRITICAL VOLUMES 457

THE SUM OF CRITICAL VOLUMES 693

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.370

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	398	0	867	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	601	0	697
SOUTHBOUND	457	189	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	219	N/A	N/A	N/A	434	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	300	N/A	0	N/A
SOUTHBOUND	457	N/A	63	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 434
NORTH-SOUTH CRITICAL VOLUMES 757

THE SUM OF CRITICAL VOLUMES 1191

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.736

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	145	409	0	33
EASTBOUND	66	579	0	272
NORTHBOUND	520	547	293	72
SOUTHBOUND	58	236	9	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	145	N/A	204	N/A	0	N/A
EASTBOUND	66	N/A	290	N/A	0	N/A
NORTHBOUND	286	N/A	547	N/A	293	N/A
SOUTHBOUND	58	N/A	N/A	245	N/A	N/A

EAST-WEST CRITICAL VOLUMES 434
NORTH-SOUTH CRITICAL VOLUMES 792

THE SUM OF CRITICAL VOLUMES 1226

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.760

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	42	882	83	0
EASTBOUND	103	977	6	0
NORTHBOUND	42	81	61	0
SOUTHBOUND	157	28	29	52

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	42	N/A	482	482	N/A	N/A
EASTBOUND	103	N/A	492	492	N/A	N/A
NORTHBOUND	N/A	92	N/A	92	N/A	N/A
SOUTHBOUND	157	N/A	28	N/A	29	N/A

EAST-WEST CRITICAL VOLUMES 585
NORTH-SOUTH CRITICAL VOLUMES 249

THE SUM OF CRITICAL VOLUMES 834

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.456

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	129	963	0	0
EASTBOUND	0	996	0	82
NORTHBOUND	0	0	180	64
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	129	N/A	482	N/A	N/A	N/A
EASTBOUND	N/A	N/A	498	N/A	0	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	180	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 627
NORTH-SOUTH CRITICAL VOLUMES 180

THE SUM OF CRITICAL VOLUMES 807

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.673

LEVEL OF SERVICE ..... B

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	180	553	53	145
EASTBOUND	175	760	204	240
NORTHBOUND	436	1492	244	0
SOUTHBOUND	264	1434	179	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	99	N/A	276	N/A	53	N/A
EASTBOUND	96	N/A	380	N/A	204	N/A
NORTHBOUND	240	N/A	579	579	N/A	N/A
SOUTHBOUND	145	N/A	538	538	N/A	N/A

EAST-WEST CRITICAL VOLUMES 479
NORTH-SOUTH CRITICAL VOLUMES 778

THE SUM OF CRITICAL VOLUMES 1257

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.814

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	146	0	0	785
EASTBOUND	0	0	0	0
NORTHBOUND	0	1871	124	0
SOUTHBOUND	736	1293	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	80	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	665	665	N/A	N/A
SOUTHBOUND	405	N/A	431	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 80
NORTH-SOUTH CRITICAL VOLUMES 1070

THE SUM OF CRITICAL VOLUMES 1150

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.707

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	8	7	37	0
EASTBOUND	250	1	0	45
NORTHBOUND	169	2583	9	0
SOUTHBOUND	27	1328	162	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	52
EASTBOUND	126	126	N/A	N/A	0	N/A
NORTHBOUND	169	N/A	864	864	N/A	N/A
SOUTHBOUND	27	N/A	497	497	N/A	N/A

EAST-WEST CRITICAL VOLUMES 178
NORTH-SOUTH CRITICAL VOLUMES 891

THE SUM OF CRITICAL VOLUMES 1069

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.677

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	231	424	62	0
EASTBOUND	0	437	44	0
NORTHBOUND	158	1960	319	0
SOUTHBOUND	62	1145	44	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	127	N/A	243	243	N/A	N/A
EASTBOUND	N/A	N/A	240	240	N/A	N/A
NORTHBOUND	158	N/A	760	760	N/A	N/A
SOUTHBOUND	62	N/A	396	396	N/A	N/A

EAST-WEST CRITICAL VOLUMES 367
NORTH-SOUTH CRITICAL VOLUMES 822

THE SUM OF CRITICAL VOLUMES 1189

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.765

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	15	23	23	0
EASTBOUND	75	18	0	651
NORTHBOUND	803	2247	33	0
SOUTHBOUND	45	1383	39	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	30	N/A	30	N/A	N/A
EASTBOUND	75	N/A	18	N/A	0	N/A
NORTHBOUND	442	N/A	760	760	N/A	N/A
SOUTHBOUND	45	N/A	474	474	N/A	N/A

EAST-WEST CRITICAL VOLUMES 105
NORTH-SOUTH CRITICAL VOLUMES 916

THE SUM OF CRITICAL VOLUMES 1021

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.616

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	57	29	154	171
EASTBOUND	19	36	24	0
NORTHBOUND	28	1022	104	0
SOUTHBOUND	171	1380	20	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	57	N/A	N/A	92	92	N/A
EASTBOUND	N/A	40	N/A	40	N/A	N/A
NORTHBOUND	28	N/A	563	563	N/A	N/A
SOUTHBOUND	171	N/A	700	700	N/A	N/A

EAST-WEST CRITICAL VOLUMES 111
NORTH-SOUTH CRITICAL VOLUMES 734

THE SUM OF CRITICAL VOLUMES 845

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.493

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	125	17	282	160
EASTBOUND	22	36	25	0
NORTHBOUND	16	850	66	0
SOUTHBOUND	319	815	16	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	71	71	N/A	N/A	282	N/A
EASTBOUND	22	N/A	N/A	61	N/A	N/A
NORTHBOUND	16	N/A	458	458	N/A	N/A
SOUTHBOUND	319	N/A	416	416	N/A	N/A

EAST-WEST CRITICAL VOLUMES 343
NORTH-SOUTH CRITICAL VOLUMES 777

THE SUM OF CRITICAL VOLUMES 1120

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.686

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	89	0	750
EASTBOUND	90	108	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	588	0	0	73

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	89	N/A	0	N/A
EASTBOUND	90	N/A	54	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	323	N/A	N/A	N/A	0	N/A

EAST-WEST CRITICAL VOLUMES 179
NORTH-SOUTH CRITICAL VOLUMES 323

THE SUM OF CRITICAL VOLUMES 502

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.268

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	653	26	0
EASTBOUND	11	412	0	0
NORTHBOUND	404	793	210	72
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	340	340	N/A	N/A
EASTBOUND	11	N/A	206	N/A	N/A	N/A
NORTHBOUND	399	399	399	N/A	210	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 351
NORTH-SOUTH CRITICAL VOLUMES 399

THE SUM OF CRITICAL VOLUMES 750

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.426

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	277	779	0	0
EASTBOUND	0	400	568	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	24	917	13	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	277	N/A	390	N/A	N/A	N/A
EASTBOUND	N/A	N/A	323	323	323	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	24	N/A	465	465	N/A	N/A

EAST-WEST CRITICAL VOLUMES 600
NORTH-SOUTH CRITICAL VOLUMES 465

THE SUM OF CRITICAL VOLUMES 1065

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.647

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	7	0	8	68
EASTBOUND	0	0	0	0
NORTHBOUND	3	359	15	0
SOUTHBOUND	137	440	17	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	7	N/A	N/A	8	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	187	N/A	190	N/A	N/A
SOUTHBOUND	137	N/A	228	228	N/A	N/A

EAST-WEST CRITICAL VOLUMES 8
NORTH-SOUTH CRITICAL VOLUMES 327

THE SUM OF CRITICAL VOLUMES 335

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.179

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	1	8	23	50
EASTBOUND	86	19	24	12
NORTHBOUND	25	475	8	0
SOUTHBOUND	100	638	72	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	9	N/A	N/A	23	N/A
EASTBOUND	86	N/A	19	N/A	24	N/A
NORTHBOUND	25	N/A	161	161	N/A	N/A
SOUTHBOUND	100	N/A	237	237	N/A	N/A

EAST-WEST CRITICAL VOLUMES 109
NORTH-SOUTH CRITICAL VOLUMES 262

THE SUM OF CRITICAL VOLUMES 371

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.198

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	13	1	58	102
EASTBOUND	35	3	5	0
NORTHBOUND	5	626	23	0
SOUTHBOUND	203	768	31	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	14	N/A	N/A	58	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	43
NORTHBOUND	5	N/A	216	216	N/A	N/A
SOUTHBOUND	203	N/A	266	266	N/A	N/A

EAST-WEST CRITICAL VOLUMES 93
NORTH-SOUTH CRITICAL VOLUMES 419

THE SUM OF CRITICAL VOLUMES 512

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.273

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	617	0	387	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	385	0	476
SOUTHBOUND	750	383	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	339	N/A	N/A	N/A	194	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	192	N/A	0	N/A
SOUTHBOUND	750	N/A	128	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 339
NORTH-SOUTH CRITICAL VOLUMES 942

THE SUM OF CRITICAL VOLUMES 1281

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.799

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	197	598	0	38
EASTBOUND	34	505	324	121
NORTHBOUND	336	242	128	98
SOUTHBOUND	152	507	30	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	197	N/A	299	N/A	0	N/A
EASTBOUND	34	N/A	252	N/A	324	N/A
NORTHBOUND	185	N/A	242	N/A	128	N/A
SOUTHBOUND	152	N/A	N/A	537	N/A	N/A

EAST-WEST CRITICAL VOLUMES 520
NORTH-SOUTH CRITICAL VOLUMES 779

THE SUM OF CRITICAL VOLUMES 1299

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.812

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	102	1170	75	0
EASTBOUND	42	1085	34	0
NORTHBOUND	34	40	48	0
SOUTHBOUND	379	48	190	21

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	102	N/A	622	622	N/A	N/A
EASTBOUND	42	N/A	560	560	N/A	N/A
NORTHBOUND	N/A	58	N/A	64	N/A	N/A
SOUTHBOUND	379	N/A	48	N/A	190	N/A

EAST-WEST CRITICAL VOLUMES 664
NORTH-SOUTH CRITICAL VOLUMES 443

THE SUM OF CRITICAL VOLUMES 1107

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.638

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	375	1045	0	0
EASTBOUND	0	1056	134	0
NORTHBOUND	0	0	0	178
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	375	N/A	522	N/A	N/A	N/A
EASTBOUND	N/A	N/A	528	N/A	134	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	0	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 903
NORTH-SOUTH CRITICAL VOLUMES 0

THE SUM OF CRITICAL VOLUMES 903

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.752

LEVEL OF SERVICE C

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	504	986	145	264
EASTBOUND	312	1124	311	380
NORTHBOUND	691	1578	344	0
SOUTHBOUND	480	2312	202	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	277	N/A	493	N/A	145	N/A
EASTBOUND	172	N/A	562	N/A	311	N/A
NORTHBOUND	380	N/A	641	641	N/A	N/A
SOUTHBOUND	264	N/A	838	838	N/A	N/A

EAST-WEST CRITICAL VOLUMES 839
NORTH-SOUTH CRITICAL VOLUMES 1218

THE SUM OF CRITICAL VOLUMES 2057

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 1.396

LEVEL OF SERVICE ..... F

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	185	0	0	672
EASTBOUND	0	0	0	0
NORTHBOUND	0	1900	167	0
SOUTHBOUND	767	1806	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	102	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	689	689	N/A	N/A
SOUTHBOUND	422	N/A	602	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 102
NORTH-SOUTH CRITICAL VOLUMES 1111

THE SUM OF CRITICAL VOLUMES 1213

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.751

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	16	1	34	0
EASTBOUND	311	2	0	50
NORTHBOUND	86	1542	15	0
SOUTHBOUND	7	1433	311	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	51
EASTBOUND	156	156	N/A	N/A	0	N/A
NORTHBOUND	86	N/A	519	519	N/A	N/A
SOUTHBOUND	7	N/A	581	581	N/A	N/A

EAST-WEST CRITICAL VOLUMES 207
NORTH-SOUTH CRITICAL VOLUMES 667

THE SUM OF CRITICAL VOLUMES 874

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.536

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	361	570	56	0
EASTBOUND	0	513	99	0
NORTHBOUND	145	1881	344	0
SOUTHBOUND	123	1457	94	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	199	N/A	313	313	N/A	N/A
EASTBOUND	N/A	N/A	306	306	N/A	N/A
NORTHBOUND	145	N/A	742	742	N/A	N/A
SOUTHBOUND	123	N/A	517	517	N/A	N/A

EAST-WEST CRITICAL VOLUMES 505
NORTH-SOUTH CRITICAL VOLUMES 865

THE SUM OF CRITICAL VOLUMES 1370

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.896

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	28	38	18	0
EASTBOUND	125	39	0	897
NORTHBOUND	679	2095	32	0
SOUTHBOUND	35	1999	76	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	42	N/A	42	N/A	N/A
EASTBOUND	125	N/A	39	N/A	0	N/A
NORTHBOUND	373	N/A	709	709	N/A	N/A
SOUTHBOUND	35	N/A	692	692	N/A	N/A

EAST-WEST CRITICAL VOLUMES 167
NORTH-SOUTH CRITICAL VOLUMES 1065

THE SUM OF CRITICAL VOLUMES 1232

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.765

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	56	23	142	208
EASTBOUND	26	51	20	0
NORTHBOUND	16	1218	178	0
SOUTHBOUND	208	1452	23	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	56	N/A	N/A	82	82	N/A
EASTBOUND	N/A	48	N/A	48	N/A	N/A
NORTHBOUND	16	N/A	698	698	N/A	N/A
SOUTHBOUND	208	N/A	738	738	N/A	N/A

EAST-WEST CRITICAL VOLUMES 108
NORTH-SOUTH CRITICAL VOLUMES 906

THE SUM OF CRITICAL VOLUMES 1014

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.612

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	343	34	277	178
EASTBOUND	36	60	11	0
NORTHBOUND	50	982	175	0
SOUTHBOUND	355	1191	60	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	188	188	N/A	N/A	277	N/A
EASTBOUND	36	N/A	N/A	71	N/A	N/A
NORTHBOUND	50	N/A	578	578	N/A	N/A
SOUTHBOUND	355	N/A	626	626	N/A	N/A

EAST-WEST CRITICAL VOLUMES 348
NORTH-SOUTH CRITICAL VOLUMES 933

THE SUM OF CRITICAL VOLUMES 1281

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.799

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	132	0	569
EASTBOUND	132	246	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	842	0	105	132

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	132	N/A	0	N/A
EASTBOUND	132	N/A	123	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	463	N/A	N/A	N/A	105	N/A

EAST-WEST CRITICAL VOLUMES 264
NORTH-SOUTH CRITICAL VOLUMES 463

THE SUM OF CRITICAL VOLUMES 727

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.388

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	978	64	0
EASTBOUND	39	569	0	0
NORTHBOUND	414	730	172	138
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	521	521	N/A	N/A
EASTBOUND	39	N/A	284	N/A	N/A	N/A
NORTHBOUND	381	381	381	N/A	172	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 560
NORTH-SOUTH CRITICAL VOLUMES 381

THE SUM OF CRITICAL VOLUMES 941

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.560

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 9U, HOTEL ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	433	960	0	0
EASTBOUND	0	550	489	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	58	896	41	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	433	N/A	480	N/A	N/A	N/A
EASTBOUND	N/A	N/A	346	346	346	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	58	N/A	468	468	N/A	N/A

EAST-WEST CRITICAL VOLUMES 779
NORTH-SOUTH CRITICAL VOLUMES 468

THE SUM OF CRITICAL VOLUMES 1247

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.775

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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Future (2013) With Ambient Growth Plus Project
(Boat Slip Development on Parcel 10R Only)

CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	15	1	125	38
EASTBOUND	0	0	0	0
NORTHBOUND	2	623	6	0
SOUTHBOUND	76	242	15	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	16	N/A	N/A	125	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	315	N/A	316	N/A	N/A
SOUTHBOUND	76	N/A	128	128	N/A	N/A

EAST-WEST CRITICAL VOLUMES 125
NORTH-SOUTH CRITICAL VOLUMES 392

THE SUM OF CRITICAL VOLUMES 517

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.276

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	2	21	81	20
EASTBOUND	151	11	0	19
NORTHBOUND	65	700	9	0
SOUTHBOUND	39	312	32	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	23	N/A	N/A	81	N/A
EASTBOUND	151	N/A	11	N/A	0	N/A
NORTHBOUND	65	N/A	236	236	N/A	N/A
SOUTHBOUND	39	N/A	115	115	N/A	N/A

EAST-WEST CRITICAL VOLUMES 232
NORTH-SOUTH CRITICAL VOLUMES 275

THE SUM OF CRITICAL VOLUMES 507

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.270

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	19	0	159	63
EASTBOUND	77	2	0	0
NORTHBOUND	5	922	16	0
SOUTHBOUND	126	348	24	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	19	N/A	N/A	159	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	79
NORTHBOUND	5	N/A	313	313	N/A	N/A
SOUTHBOUND	126	N/A	124	124	N/A	N/A

EAST-WEST CRITICAL VOLUMES 236
NORTH-SOUTH CRITICAL VOLUMES 439

THE SUM OF CRITICAL VOLUMES 675

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.360

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	359	0	867	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	585	0	659
SOUTHBOUND	457	164	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	197	N/A	N/A	N/A	434	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	292	N/A	0	N/A
SOUTHBOUND	457	N/A	55	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 434
NORTH-SOUTH CRITICAL VOLUMES 749

THE SUM OF CRITICAL VOLUMES 1183

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.730

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	123	409	0	33
EASTBOUND	66	579	0	270
NORTHBOUND	518	546	291	61
SOUTHBOUND	58	235	9	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	123	N/A	204	N/A	0	N/A
EASTBOUND	66	N/A	290	N/A	0	N/A
NORTHBOUND	285	N/A	546	N/A	291	N/A
SOUTHBOUND	58	N/A	N/A	244	N/A	N/A

EAST-WEST CRITICAL VOLUMES 412
NORTH-SOUTH CRITICAL VOLUMES 790

THE SUM OF CRITICAL VOLUMES 1202

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.744

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	42	843	83	0
EASTBOUND	103	939	6	0
NORTHBOUND	42	81	61	0
SOUTHBOUND	157	28	29	52

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	42	N/A	463	463	N/A	N/A
EASTBOUND	103	N/A	472	472	N/A	N/A
NORTHBOUND	N/A	92	N/A	92	N/A	N/A
SOUTHBOUND	157	N/A	28	N/A	29	N/A

EAST-WEST CRITICAL VOLUMES 566
NORTH-SOUTH CRITICAL VOLUMES 249

THE SUM OF CRITICAL VOLUMES 815

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.443

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	129	941	0	0
EASTBOUND	0	983	0	82
NORTHBOUND	0	0	180	64
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	129	N/A	470	N/A	N/A	N/A
EASTBOUND	N/A	N/A	492	N/A	0	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	180	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 621
NORTH-SOUTH CRITICAL VOLUMES 180

THE SUM OF CRITICAL VOLUMES 801

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.668

LEVEL OF SERVICE ..... B

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	180	543	53	145
EASTBOUND	170	752	208	236
NORTHBOUND	430	1492	244	0
SOUTHBOUND	264	1434	173	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	99	N/A	272	N/A	53	N/A
EASTBOUND	94	N/A	376	N/A	208	N/A
NORTHBOUND	236	N/A	579	579	N/A	N/A
SOUTHBOUND	145	N/A	536	536	N/A	N/A

EAST-WEST CRITICAL VOLUMES 475
NORTH-SOUTH CRITICAL VOLUMES 772

THE SUM OF CRITICAL VOLUMES 1247

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.807

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	146	0	0	779
EASTBOUND	0	0	0	0
NORTHBOUND	0	1871	124	0
SOUTHBOUND	736	1293	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	80	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	665	665	N/A	N/A
SOUTHBOUND	405	N/A	431	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 80
NORTH-SOUTH CRITICAL VOLUMES 1070

THE SUM OF CRITICAL VOLUMES 1150

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.707

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	8	7	37	0
EASTBOUND	250	1	0	45
NORTHBOUND	166	2583	9	0
SOUTHBOUND	27	1328	162	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	52
EASTBOUND	126	126	N/A	N/A	0	N/A
NORTHBOUND	166	N/A	864	864	N/A	N/A
SOUTHBOUND	27	N/A	497	497	N/A	N/A

EAST-WEST CRITICAL VOLUMES 178
NORTH-SOUTH CRITICAL VOLUMES 891

THE SUM OF CRITICAL VOLUMES 1069

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.677

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	231	398	62	0
EASTBOUND	0	410	41	0
NORTHBOUND	155	1957	319	0
SOUTHBOUND	62	1145	44	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	127	N/A	230	230	N/A	N/A
EASTBOUND	N/A	N/A	226	226	N/A	N/A
NORTHBOUND	155	N/A	759	759	N/A	N/A
SOUTHBOUND	62	N/A	396	396	N/A	N/A

EAST-WEST CRITICAL VOLUMES 353
NORTH-SOUTH CRITICAL VOLUMES 821

THE SUM OF CRITICAL VOLUMES 1174

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.754

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	15	23	23	0
EASTBOUND	75	18	0	643
NORTHBOUND	796	2241	33	0
SOUTHBOUND	45	1380	39	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	30	N/A	30	N/A	N/A
EASTBOUND	75	N/A	18	N/A	0	N/A
NORTHBOUND	438	N/A	758	758	N/A	N/A
SOUTHBOUND	45	N/A	473	473	N/A	N/A

EAST-WEST CRITICAL VOLUMES 105
NORTH-SOUTH CRITICAL VOLUMES 911

THE SUM OF CRITICAL VOLUMES 1016

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.613

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	57	29	151	171
EASTBOUND	19	36	24	0
NORTHBOUND	28	986	104	0
SOUTHBOUND	171	1342	20	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	57	N/A	N/A	90	90	N/A
EASTBOUND	N/A	40	N/A	40	N/A	N/A
NORTHBOUND	28	N/A	545	545	N/A	N/A
SOUTHBOUND	171	N/A	681	681	N/A	N/A

EAST-WEST CRITICAL VOLUMES 109
NORTH-SOUTH CRITICAL VOLUMES 716

THE SUM OF CRITICAL VOLUMES 825

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.479

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	125	17	269	144
EASTBOUND	22	36	25	0
NORTHBOUND	16	843	66	0
SOUTHBOUND	289	807	16	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	71	71	N/A	N/A	269	N/A
EASTBOUND	22	N/A	N/A	61	N/A	N/A
NORTHBOUND	16	N/A	454	454	N/A	N/A
SOUTHBOUND	289	N/A	412	412	N/A	N/A

EAST-WEST CRITICAL VOLUMES 330
NORTH-SOUTH CRITICAL VOLUMES 743

THE SUM OF CRITICAL VOLUMES 1073

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.653

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	89	0	743
EASTBOUND	90	108	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	580	0	0	73

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	89	N/A	0	N/A
EASTBOUND	90	N/A	54	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	319	N/A	N/A	N/A	0	N/A

EAST-WEST CRITICAL VOLUMES 179
NORTH-SOUTH CRITICAL VOLUMES 319

THE SUM OF CRITICAL VOLUMES 498

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.266

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	653	26	0
EASTBOUND	11	412	0	0
NORTHBOUND	378	787	210	72
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	340	340	N/A	N/A
EASTBOUND	11	N/A	206	N/A	N/A	N/A
NORTHBOUND	378	N/A	394	N/A	210	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 351
NORTH-SOUTH CRITICAL VOLUMES 394

THE SUM OF CRITICAL VOLUMES 745

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.423

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: AM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	277	753	0	0
EASTBOUND	0	400	541	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	24	917	13	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	277	N/A	376	N/A	N/A	N/A
EASTBOUND	N/A	N/A	314	314	314	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	24	N/A	465	465	N/A	N/A

EAST-WEST CRITICAL VOLUMES 591
NORTH-SOUTH CRITICAL VOLUMES 465

THE SUM OF CRITICAL VOLUMES 1056

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.641

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:1, TAHITI WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	7	0	8	68
EASTBOUND	0	0	0	0
NORTHBOUND	3	359	15	0
SOUTHBOUND	137	440	17	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	7	N/A	N/A	8	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	187	N/A	190	N/A	N/A
SOUTHBOUND	137	N/A	228	228	N/A	N/A

EAST-WEST CRITICAL VOLUMES 8
NORTH-SOUTH CRITICAL VOLUMES 327

THE SUM OF CRITICAL VOLUMES 335

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.179

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:2, MARQUESAS WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	1	8	20	52
EASTBOUND	86	19	24	12
NORTHBOUND	25	419	8	0
SOUTHBOUND	100	592	72	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	9	N/A	N/A	20	N/A
EASTBOUND	86	N/A	19	N/A	24	N/A
NORTHBOUND	25	N/A	142	142	N/A	N/A
SOUTHBOUND	100	N/A	221	221	N/A	N/A

EAST-WEST CRITICAL VOLUMES 106
NORTH-SOUTH CRITICAL VOLUMES 246

THE SUM OF CRITICAL VOLUMES 352

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.188

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:3, PANAY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	13	1	58	102
EASTBOUND	35	3	5	0
NORTHBOUND	5	569	23	0
SOUTHBOUND	203	722	31	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	0	1	0	2
EASTBOUND	0	0	0	0	0	1	1
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	14	N/A	N/A	58	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	43
NORTHBOUND	5	N/A	197	197	N/A	N/A
SOUTHBOUND	203	N/A	251	251	N/A	N/A

EAST-WEST CRITICAL VOLUMES 93
NORTH-SOUTH CRITICAL VOLUMES 400

THE SUM OF CRITICAL VOLUMES 493

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.263

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:4, ADMIRALTY WAY AND VIA MARINA
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	589	0	387	0
EASTBOUND	0	0	0	0
NORTHBOUND	0	368	0	436
SOUTHBOUND	750	365	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	0	1	0	3
SOUTHBOUND	1	0	3	0	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	324	N/A	N/A	N/A	194	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	184	N/A	0	N/A
SOUTHBOUND	750	N/A	122	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 324
NORTH-SOUTH CRITICAL VOLUMES 934

THE SUM OF CRITICAL VOLUMES 1258

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.783

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:5, WASHINGTON BOULEVARD AND VIA MARINA/OCEAN AVENUE
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	181	598	0	38
EASTBOUND	34	505	324	120
NORTHBOUND	334	241	122	90
SOUTHBOUND	152	506	30	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	1	0	4
EASTBOUND	1	0	2	0	1	0	4
NORTHBOUND	2	0	1	0	1	0	4
SOUTHBOUND	1	0	0	1	0	0	2

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	181	N/A	299	N/A	0	N/A
EASTBOUND	34	N/A	252	N/A	324	N/A
NORTHBOUND	184	N/A	241	N/A	122	N/A
SOUTHBOUND	152	N/A	N/A	536	N/A	N/A

EAST-WEST CRITICAL VOLUMES 504
NORTH-SOUTH CRITICAL VOLUMES 777

THE SUM OF CRITICAL VOLUMES 1281

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.799

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Northbound and Southbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:6, ADMIRALTY WAY AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	102	1142	75	0
EASTBOUND	42	1045	34	0
NORTHBOUND	34	40	48	0
SOUTHBOUND	379	48	190	21

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	1	1	0	0	3
EASTBOUND	1	0	1	1	0	0	3
NORTHBOUND	0	1	0	1	0	0	2
SOUTHBOUND	1	0	1	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	102	N/A	608	608	N/A	N/A
EASTBOUND	42	N/A	540	540	N/A	N/A
NORTHBOUND	N/A	58	N/A	64	N/A	N/A
SOUTHBOUND	379	N/A	48	N/A	190	N/A

EAST-WEST CRITICAL VOLUMES 650
NORTH-SOUTH CRITICAL VOLUMES 443

THE SUM OF CRITICAL VOLUMES 1093

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.629

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:7, WASHINGTON BOULEVARD AND PALAWAN WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	375	1029	0	0
EASTBOUND	0	1042	134	0
NORTHBOUND	0	0	0	178
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	2	0	1	0	3
NORTHBOUND	0	0	0	0	1	0	1
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	375	N/A	514	N/A	N/A	N/A
EASTBOUND	N/A	N/A	521	N/A	134	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	0	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 896
NORTH-SOUTH CRITICAL VOLUMES 0

THE SUM OF CRITICAL VOLUMES 896

NUMBER OF CRITICAL CLEARANCE INTERVALS 2

CMA VALUE 0.747

LEVEL OF SERVICE C

Capacity used = 1200.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:8, WASHINGTON BOULEVARD AND LINCOLN BOULEVARD
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	504	979	145	264
EASTBOUND	306	1116	314	377
NORTHBOUND	686	1578	344	0
SOUTHBOUND	480	2312	198	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	2	0	1	0	5
EASTBOUND	2	0	2	0	1	0	5
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	2	0	2	1	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	277	N/A	490	N/A	145	N/A
EASTBOUND	168	N/A	558	N/A	314	N/A
NORTHBOUND	377	N/A	641	641	N/A	N/A
SOUTHBOUND	264	N/A	837	837	N/A	N/A

EAST-WEST CRITICAL VOLUMES 835
NORTH-SOUTH CRITICAL VOLUMES 1214

THE SUM OF CRITICAL VOLUMES 2049

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 1.390

LEVEL OF SERVICE ..... F

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:9, LINCOLN BOULEVARD AND MARINA EXPRESSWAY (SR 90)
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	185	0	0	667
EASTBOUND	0	0	0	0
NORTHBOUND	0	1900	167	0
SOUTHBOUND	767	1806	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	0	0	2	0	4
EASTBOUND	0	0	0	0	0	0	0
NORTHBOUND	0	0	2	1	0	0	3
SOUTHBOUND	2	0	3	0	0	0	5

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	102	N/A	N/A	N/A	0	N/A
EASTBOUND	N/A	N/A	N/A	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	689	689	N/A	N/A
SOUTHBOUND	422	N/A	602	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 102
NORTH-SOUTH CRITICAL VOLUMES 1111

THE SUM OF CRITICAL VOLUMES 1213

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.751

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:10, LINCOLN BOULEVARD AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	16	1	34	0
EASTBOUND	311	2	0	50
NORTHBOUND	84	1542	15	0
SOUTHBOUND	7	1433	311	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	0	0	0	1	1
EASTBOUND	1	1	0	0	1	0	3
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	N/A	N/A	N/A	51
EASTBOUND	156	156	N/A	N/A	0	N/A
NORTHBOUND	84	N/A	519	519	N/A	N/A
SOUTHBOUND	7	N/A	581	581	N/A	N/A

EAST-WEST CRITICAL VOLUMES 207
NORTH-SOUTH CRITICAL VOLUMES 665

THE SUM OF CRITICAL VOLUMES 872

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.534

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:11, LINCOLN BOULEVARD AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	361	552	56	0
EASTBOUND	0	484	96	0
NORTHBOUND	142	1879	344	0
SOUTHBOUND	123	1457	94	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	2	0	1	1	0	0	4
EASTBOUND	0	0	1	1	0	0	2
NORTHBOUND	1	0	2	1	0	0	4
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	199	N/A	304	304	N/A	N/A
EASTBOUND	N/A	N/A	290	290	N/A	N/A
NORTHBOUND	142	N/A	741	741	N/A	N/A
SOUTHBOUND	123	N/A	517	517	N/A	N/A

EAST-WEST CRITICAL VOLUMES 489
NORTH-SOUTH CRITICAL VOLUMES 864

THE SUM OF CRITICAL VOLUMES 1353

NUMBER OF CRITICAL CLEARANCE INTERVALS 4*

CMA VALUE 0.884

LEVEL OF SERVICE ..... D

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:12, LINCOLN BOULEVARD AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	28	38	18	0
EASTBOUND	125	39	0	889
NORTHBOUND	674	2090	32	0
SOUTHBOUND	35	1996	76	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	1	0	1	0	0	2
EASTBOUND	1	0	1	0	1	0	3
NORTHBOUND	2	0	2	1	0	0	5
SOUTHBOUND	1	0	2	1	0	0	4

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	42	N/A	42	N/A	N/A
EASTBOUND	125	N/A	39	N/A	0	N/A
NORTHBOUND	371	N/A	707	707	N/A	N/A
SOUTHBOUND	35	N/A	691	691	N/A	N/A

EAST-WEST CRITICAL VOLUMES 167
NORTH-SOUTH CRITICAL VOLUMES 1062

THE SUM OF CRITICAL VOLUMES 1229

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.762

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:13, ADMIRALTY WAY AND BALI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	56	23	140	208
EASTBOUND	26	51	20	0
NORTHBOUND	16	1192	178	0
SOUTHBOUND	208	1412	23	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	0	1	1	0	3
EASTBOUND	0	1	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	56	N/A	N/A	82	82	N/A
EASTBOUND	N/A	48	N/A	48	N/A	N/A
NORTHBOUND	16	N/A	685	685	N/A	N/A
SOUTHBOUND	208	N/A	718	718	N/A	N/A

EAST-WEST CRITICAL VOLUMES 108
NORTH-SOUTH CRITICAL VOLUMES 893

THE SUM OF CRITICAL VOLUMES 1001

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.602

LEVEL OF SERVICE ..... B

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:14, ADMIRALTY WAY AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	343	34	272	162
EASTBOUND	36	60	11	0
NORTHBOUND	50	977	175	0
SOUTHBOUND	323	1183	60	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	1	0	0	1	0	3
EASTBOUND	1	0	0	1	0	0	2
NORTHBOUND	1	0	1	1	0	0	3
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	188	188	N/A	N/A	272	N/A
EASTBOUND	36	N/A	N/A	71	N/A	N/A
NORTHBOUND	50	N/A	576	576	N/A	N/A
SOUTHBOUND	323	N/A	622	622	N/A	N/A

EAST-WEST CRITICAL VOLUMES 343
NORTH-SOUTH CRITICAL VOLUMES 899

THE SUM OF CRITICAL VOLUMES 1242

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.772

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

Eastbound and Westbound approaches have opposed signal phases.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:15, ADMIRALTY WAY AND FIJI WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS MIN ON GREEN	MAX ON RED **
WESTBOUND	0	132	0	564
EASTBOUND	132	246	0	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	834	0	105	132

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	0	1	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	2	0	0	0	1	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	132	N/A	0	N/A
EASTBOUND	132	N/A	123	N/A	N/A	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	459	N/A	N/A	N/A	105	N/A

EAST-WEST CRITICAL VOLUMES 264
NORTH-SOUTH CRITICAL VOLUMES 459

THE SUM OF CRITICAL VOLUMES 723

NUMBER OF CRITICAL CLEARANCE INTERVALS 2*

CMA VALUE 0.386

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:16, MARINA EXPRESSWAY (SR 90) WESTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	0	978	64	0
EASTBOUND	39	569	0	0
NORTHBOUND	396	725	172	138
SOUTHBOUND	0	0	0	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	0	0	1	1	0	0	2
EASTBOUND	1	0	2	0	0	0	3
NORTHBOUND	1	1	1	0	1	0	4
SOUTHBOUND	0	0	0	0	0	0	0

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	N/A	N/A	521	521	N/A	N/A
EASTBOUND	39	N/A	284	N/A	N/A	N/A
NORTHBOUND	374	374	374	N/A	172	N/A
SOUTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A

EAST-WEST CRITICAL VOLUMES 560
NORTH-SOUTH CRITICAL VOLUMES 374

THE SUM OF CRITICAL VOLUMES 934

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.555

LEVEL OF SERVICE ..... A

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* Includes CMA value decreased due to ATCS Implementation.

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CRAIN & ASSOCIATES
CMA CALCULATIONS

INTERSECTION:17, MARINA EXPRESSWAY (SR 90) EASTBOUND AND MINDANAO WAY
DATE: 11/29/2007 INITIALS: JL PERIOD: PM PEAK HOUR
CASE: FUTURE (2013) W/ AMBIENT GROWTH + PROJ(PARCEL 10R, BOAT SLIPS ONLY)

** INPUT VOLUMES **

APPROACH	LEFT	THROUGH	** RIGHT TURNS ** MIN ON GREEN	MAX ON RED
WESTBOUND	433	942	0	0
EASTBOUND	0	550	460	0
NORTHBOUND	0	0	0	0
SOUTHBOUND	58	896	41	0

** NUMBER OF LANES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED	TOTAL LANES
WESTBOUND	1	0	2	0	0	0	3
EASTBOUND	0	0	1	1	1	0	3
NORTHBOUND	0	0	0	0	0	0	0
SOUTHBOUND	1	0	1	1	0	0	3

** ASSIGNED LANE VOLUMES **

APPROACH	LEFT ONLY	LEFT SHARED	THROUGH ONLY	RIGHT SHARED	RIGHT ONLY	L/T/R SHARED
WESTBOUND	433	N/A	471	N/A	N/A	N/A
EASTBOUND	N/A	N/A	337	337	337	N/A
NORTHBOUND	N/A	N/A	N/A	N/A	N/A	N/A
SOUTHBOUND	58	N/A	468	468	N/A	N/A

EAST-WEST CRITICAL VOLUMES 770
NORTH-SOUTH CRITICAL VOLUMES 468

THE SUM OF CRITICAL VOLUMES 1238

NUMBER OF CRITICAL CLEARANCE INTERVALS 3*

CMA VALUE 0.769

LEVEL OF SERVICE C

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* Includes CMA value decreased due to ATCS Implementation.

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FEDERAL EXPRESS

August 20, 2004

Mr. John Santry
Development Manager
Legacy Partners
30 Executive Park, Suite 100
Irvine, California 92614

RE: Parking Utilization Study – Parcel FF (Lot 12) in Marina del Rey

Dear John,

We have completed our review and analysis of the typical (non-holiday) weekend parking utilizations for public parking Lot 12 on Parcel FF in Marina del Rey. A detailed description of the analysis methodologies and findings is provided below, but to summarize the results of our study, the parking lot is not heavily utilized during typical weekends, with an average of between 60 and 70 vehicles accessing the parking facilities during any of the 24-hour periods examined. These vehicles do not arrive all at once, but are spread out throughout the day, and as a result, only about 25 to 30 vehicles are actually parked at the lot during the maximum utilizations observed. This equates to a maximum of 15 percent of the approximately 206 spaces provided.

However, this data alone does not reflect the entire story. Observations of the activity at the lot indicated that, during the daytime hours (8:30 AM to 4:30 PM), a majority of the vehicles accessing the parking lot were associated with residential parking needs for the adjacent apartments. These vehicles, some of which were observed to stay in the lot for extended periods (such as throughout the weekend or longer), are used by residents or visitors to the apartment developments located adjacent to or near by this parking lot. Therefore, of the 30 or so vehicles using the lot during the peak utilization periods, our observations indicate that over one-half of the parking lot visitors use the lot as residential overflow parking for the nearby developments.

Analysis Methodology and Data Collection

Public Parking Lot 12 is located on Parcel FF, at the northeast corner of Via Marina and Marquesas Way in Marina del Rey. The lot is accessed via a single driveway located near the eastern end of the lot, and provides a total of 206 parking spaces. Access to the parking lot is controlled by an automated gate arm, and there is a flat fee of $5.00 per entry at all times of the day. A schematic layout of Parking Lot 12 is attached for reference.

Data used to identify the activity and utilization of the lot was collected using two separate methods. First, automated pneumatic traffic count tubes were placed across the Lot 12 entry and exit driveway lanes, to record the number of vehicles entering and exiting the lot on a 24-hour basis. The data provided by these counters was used to produce a 24-hour profile of vehicular activity at the lot, including total vehicles accessing the lot; identification of peak activity periods throughout the weekend; and a calculation of the "accumulation" of vehicles parked in the lot at any time during the weekends surveyed.

Secondly, manual parking lot utilization counts ("sweeps") were conducted during the daytime hours when the lot is most active. These counts occurred on an hourly basis between 8:30 AM and 4:30 PM, and involved physically counting the number of vehicles parked in the lot during each hour. Additionally, as vehicles entered the lot during these times, the general destinations of the occupants was noted, in order to provide basic information regarding whether the vehicle was parking for Marina-related activities, or if it was in conjunction with the adjacent apartment uses. Drivers and other occupants of the vehicles were not interviewed as to their destinations or purpose for the visit; the data collected was observational in nature, and exact destinations could not be determined for all activities. In general, if persons were not observed directly accessing the nearby apartments, the destination was conservatively assumed to be "Marina related".

Data was collected over a period of three non-holiday weekends in late June and mid-July, 2004. Automated "tube" counts were conducted on both Saturday and Sunday on June 26th and 27th, on July 10th and 11th, and again on July 17th and 18th. Manual parking sweeps and vehicle occupant destination observations were performed on Saturday, July 10th and again on Saturday and Sunday, July 17th and 18th. These days represent typical non-holiday summer weekends. Weather conditions were also typical, with some early morning fog or cloudiness, clearing in the late morning. Temperatures were in the upper 70's and low 80's on all of the survey days.

Analysis Results and Conclusions

A review of the preliminary data indicated that the 24-hour counts performed on June 26th and 27th were corrupted. The tubes became dislodged during late Saturday, and did not accurately tally the entry or exit volumes for the site. No daytime manual parking sweeps were scheduled for this weekend, and as such, no correlating data was available with which to correct the tube count inaccuracies. Therefore, the data from this weekend was not utilized in our analyses. However, periodic "spot" observations of the site during the day indicated that there were approximately nine vehicles parked in the lot at 11:30 AM, 13 vehicles on site at 3:15 PM, and 22 vehicles using the parking lot at 8:15 PM. While not included in our assessment of the Lot 12 utilizations, these observations are consistent with the data collected during the later weekends.

The 24-hour vehicle counts conducted on July 17th and 18th, and again of the 24th and 25th were, however, supplemented by manual parking sweeps and vehicle occupant destination observations, with the exception of Sunday July 11th. The data collected during these periods is summarized in the attachments to this letter. These attachments include the 24-hour automated count summary sheets; a summary of the calculated "vehicle accumulations" based on these counts, including the manual parking sweep correlation data; and a log of the vehicle occupant destination observations. Also provided are several graphics showing the parking lot utilizations for each of the four days, as well as graphs detailing the cumulative entry/exit and parking activity on the lot. The vehicle occupancy graph (single line graph) indicates the total number of vehicles parked on the lot during each hour of the surveyed weekends. The cumulative parking activity graph (two-line graph) show the entering versus exiting traffic at the lot throughout each weekend. The parking lot occupancy can be determined by the vertical distance between the upper and lower lines. These graphs present the same data as the parking accumulation graphs, but in a format that identifies the total traffic generated by the parking activity.

As shown in these attachments, the parking activity at Lot 12 was not heavy during either of the two weekends surveyed. On Saturday July 10th, a total of 66 vehicles entered the lot, and maximum parking occupancy was about 28 vehicles at 3:00 PM. On this day, of 16 vehicles observed between 8:30 AM and 4:30 PM, 13 vehicles (81 percent) had destinations related to the adjacent apartment developments. Activity on Sunday July 11th was slightly less, with a total of 59 vehicles entering the site. However, peak parking use was slightly higher, with a total of 31 vehicles parked in the lot at about 3:45 PM. No destination observations were taken on this day.

The following weekend, on Saturday July 17th, a total of 71 vehicles entered the lot, and maximum parking utilization occurred between about 4:30 and 5:30 PM, when 27 vehicles were present. Of the 31 vehicles observed during that day, occupants of 20 of those vehicles (65 percent) were destined for the nearby apartment uses. Finally, on Sunday July 18th, 56 vehicles accessed the parking lot. The peak parking use for this day was 27 vehicles, which occurred at 2:30 PM and again at 3:45 PM. The majority of the nominal parking activity observed on this day (20 of the 28 observed vehicles) appeared to be related to uses other than the adjacent apartment developments.

In total, the activity at Parking Lot 12 was nominal. Over the four weekend days observed, a total of only 252 vehicles entered the lot, or an average of 63 vehicles per day. Peak parking utilization of the 206-space lot was only 31 vehicles (15 percent), and typical midday parking lot occupancies were approximately 20 or so vehicles during all of the days surveyed. Additionally, the average data showed that over half of the vehicles parked in the lot at any time were in conjunction with the nearby apartments. The average of the three days observed showed that approximately 55 percent of the parking activity was due to resident or visitor parking for the adjacent or nearby apartment developments.

Based on our data, observations, and analyses, it is our conclusion that Parking Lot 12 does not well serve the public parking function for which it was initially intended. The lack of public parking use of Lot 12 is perhaps best explained by the LCP's reference to Lot 12 as "overflow" parking for the Pierview Café (see attached Figure 3, "County Owned Public Parking Lots" from the Marina del Rey Land Use Plan). Once a popular restaurant located across Marquesas Way from Lot 12 on parcel 10R, the Pierview Café went out of business some years ago and the restaurant structure was converted to storage use related to the existing Neptune Marina apartments on Parcel 10R. Thus, patron "overflow" parking for that establishment is no longer needed at Lot 12.

Our observations and analyses indicate that the Lot 12 location within the Marina is not conducive to its use as a public parking facility. The lot is not directly adjacent to any public beach within the Marina and it is located quite far from the Pacific Ocean beaches. Moreover, the western side of Marina del Rey, particularly south of Panay Way, is primarily a residential community, and there is little public-related or visitor-serving activity that occurs in this area. This lack of marine or visitor-related parking use on Lot 12 is contrasted by the primary use of the lot by residents and visitors of the nearby and adjacent apartment developments. Most of the vehicles currently using the Lot 12 facilities are overflow parking from these developments, either due to convenience or lack of adequate on site parking for the individual developments. However, this amount of parking is not significant, and overall, Lot 12 is inadequately utilized, with a maximum parking occupancy of 15 percent during the two weekends surveyed. (It should be noted that as the Lot 12-adjacent Parcels 10R, 12, and 15 are redeveloped with new apartment and anchorage facilities, the parking facilities for these projects will be significantly upgraded and the amount of on site parking increased to be consistent with current County Code parking requirements. The additional on site parking supplies for these developments will further reduce the parking usage of Lot 12, as persons who currently utilize this lot as overflow parking for the currently inadequate parking supplies at the adjacent residential developments will relocate to the free guest parking facilities provided in these new apartment and marina projects.)

Please review the data and conclusions discussed above and summarized in the attachments, and feel free to call me if you have any questions.

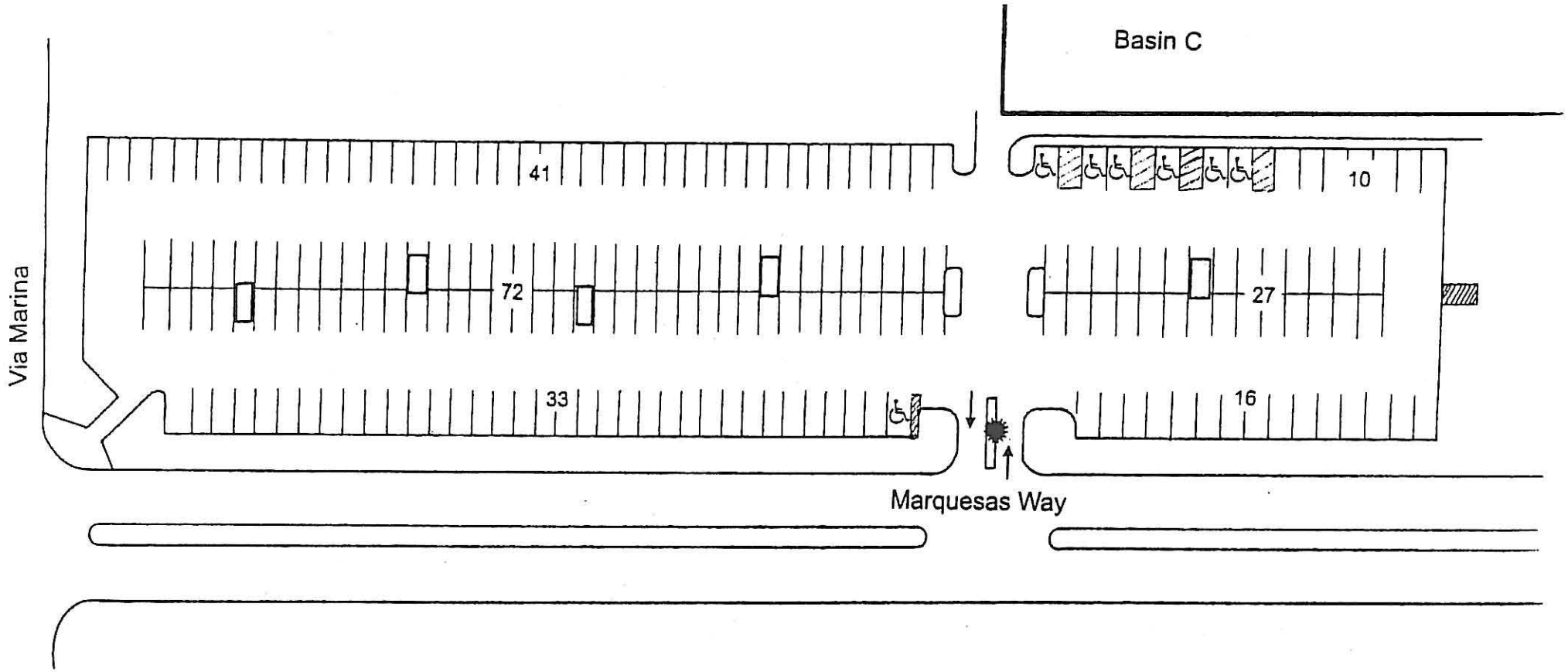
Sincerely,

Ron Hirsch
Senior Transportation Planner

RH
C15032
attachments

cc: Aaron Clark ✓

PARKING LOT #12 (Parcel FF)



Pay and Display Machine

REGULAR SPACES	199
DISABLED	7
TOTAL	206

L.A. COUNTY DEPARTMENT OF BEACHES AND HARBORS

Revised 8 / 2002 by CLS

THE TRAFFIC SOLUTION - ADT WORKSHEET

CLIENT: CRAIN & ASSOCIATES
PROJECT: PARCEL FF - MARINA DEL REY
LOCATION: ACCESS DRIVEWAY
DATE: SATURDAY, JULY 10, 2004
FILE NO: A-1

DIRECTION:	ENTRANCE				
TIME	00-15	15-30	30-45	45-60	HOUR TOTALS
00:00	0	0	1	0	1
01:00	0	0	0	0	0
02:00	0	0	0	0	0
03:00	0	0	0	0	0
04:00	0	0	0	0	0
05:00	0	0	0	0	0
06:00	0	2	0	0	2
07:00	0	2	0	0	2
08:00	8	0	1	0	9
09:00	0	4	0	0	4
10:00	0	0	0	0	0
11:00	0	1	0	0	1
12:00	0	0	0	7	7
13:00	0	6	0	0	6
14:00	0	0	3	4	7
15:00	2	2	0	3	7
16:00	3	2	1	0	6
17:00	0	0	0	0	0
18:00	2	3	2	0	7
19:00	0	0	2	0	2
20:00	2	0	0	0	2
21:00	0	0	0	2	2
22:00	0	0	0	0	0
23:00	1	0	0	0	1
				TOTAL	66

AM PEAK HOUR	07:15-08:15
VOLUME	10
PM PEAK HOUR	12:30-13:30
VOLUME	13

DIRECTION:	EXIT				
TIME	00-15	15-30	30-45	45-60	HOUR TOTALS
00:00	0	0	0	0	0
01:00	0	0	0	0	0
02:00	0	0	0	0	0
03:00	0	0	0	0	0
04:00	0	0	0	0	0
05:00	0	0	0	0	0
06:00	0	0	0	0	0
07:00	1	1	0	0	2
08:00	0	1	2	0	3
09:00	0	0	1	0	1
10:00	0	0	1	0	1
11:00	0	2	0	0	2
12:00	0	0	0	0	0
13:00	0	0	0	0	0
14:00	0	4	0	0	4
15:00	0	6	4	2	12
16:00	1	0	2	0	3
17:00	1	3	0	2	6
18:00	2	0	0	0	2
19:00	0	2	5	2	9
20:00	0	1	0	3	4
21:00	0	2	1	1	4
22:00	0	0	0	3	3
23:00	0	0	2	1	3
				TOTAL	59

AM PEAK HOUR	07:45-08:45
VOLUME	3
PM PEAK HOUR	15:15-16:15
VOLUME	13

TOTAL BI-DIRECTIONAL VOLUME	125

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

THE TRAFFIC SOLUTION - ADT WORKSHEET

CLIENT: CRAIN & ASSOCIATES
PROJECT: PARCEL FF - MARINA DEL REY
LOCATION: ACCESS DRIVEWAY
DATE: SUNDAY, JULY 11, 2004
FILE NO: A-2

DIRECTION:	ENTRANCE				
TIME	00-15	15-30	30-45	45-60	HOUR TOTALS
00:00	0	0	0	0	0
01:00	0	0	0	0	0
02:00	0	0	0	0	0
03:00	0	0	0	0	0
04:00	0	0	0	0	0
05:00	0	0	0	0	0
06:00	0	0	0	0	0
07:00	0	4	2	0	6
08:00	0	0	1	0	1
09:00	0	0	2	0	2
10:00	1	2	0	0	3
11:00	1	2	2	5	10
12:00	0	1	0	3	4
13:00	0	1	1	0	2
14:00	3	0	0	0	3
15:00	2	5	5	1	13
16:00	0	4	0	0	4
17:00	0	0	2	0	2
18:00	0	0	2	0	2
19:00	0	0	0	0	0
20:00	2	0	0	0	2
21:00	0	5	0	0	5
22:00	0	0	0	0	0
23:00	0	0	0	0	0
				TOTAL	59

AM PEAK HOUR	11:00-12:00
VOLUME	10
PM PEAK HOUR	15:00-16:00
VOLUME	8

DIRECTION:	EXIT				
TIME	00-15	15-30	30-45	45-60	HOUR TOTALS
00:00	0	0	0	2	2
01:00	0	2	0	0	2
02:00	0	0	0	0	0
03:00	0	0	1	0	1
04:00	0	0	0	0	0
05:00	0	0	0	0	0
06:00	0	0	0	1	1
07:00	0	1	0	0	1
08:00	0	0	0	1	1
09:00	0	0	2	0	2
10:00	0	0	0	0	0
11:00	1	0	4	0	5
12:00	0	3	1	0	4
13:00	0	0	0	0	0
14:00	1	0	0	0	1
15:00	0	0	0	0	0
16:00	2	3	1	0	6
17:00	5	0	1	3	9
18:00	1	0	0	1	2
19:00	1	2	0	0	3
20:00	2	1	5	0	8
21:00	0	0	0	0	0
22:00	0	0	0	1	1
23:00	2	0	0	0	2
				TOTAL	51

AM PEAK HOUR	10:45-11:45
VOLUME	5
PM PEAK HOUR	17:00-18:00
VOLUME	9

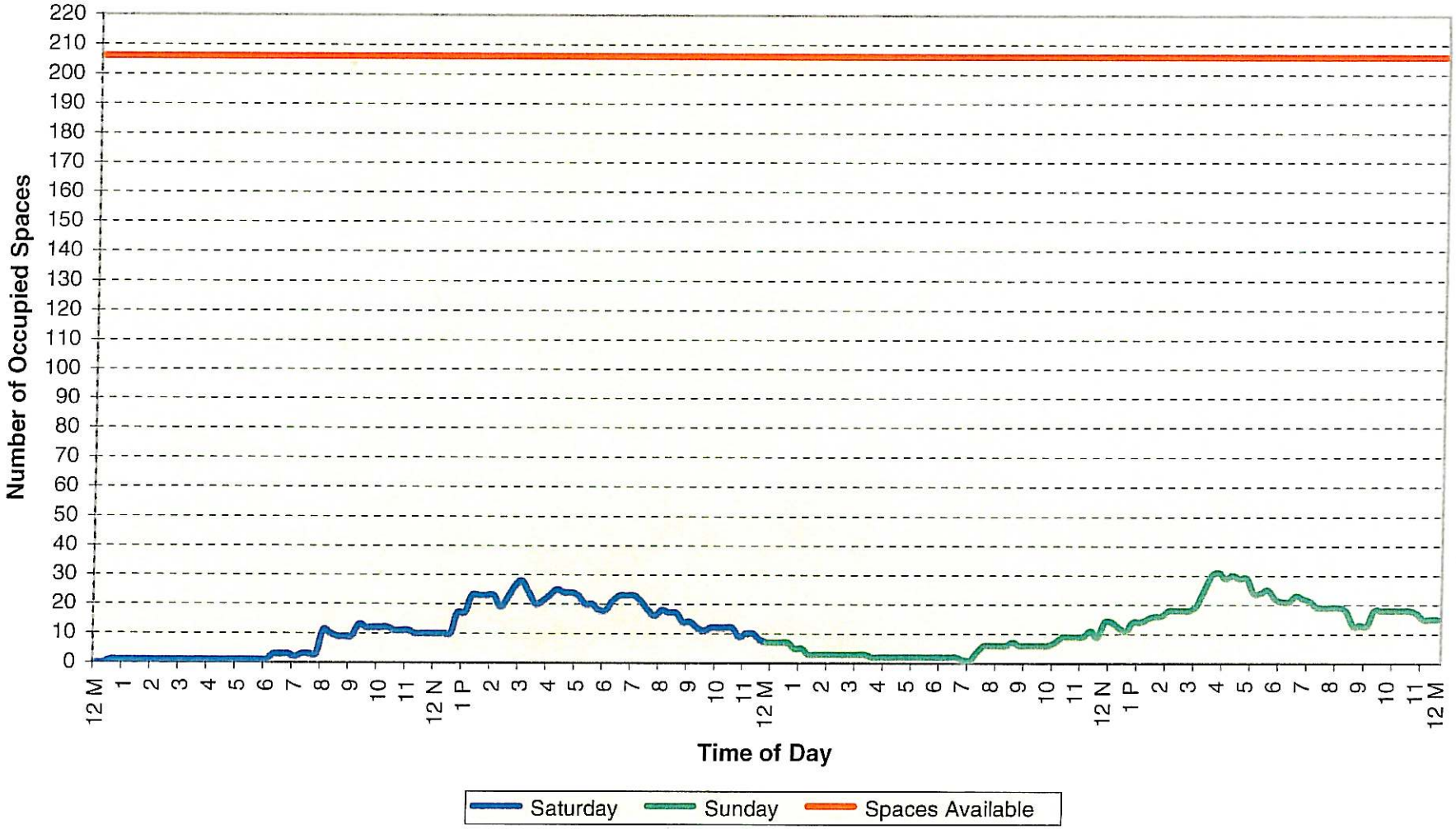
TOTAL BI-DIRECTIONAL VOLUME	110

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

Parcel FF Parking Accumulations

Saturday and Sunday

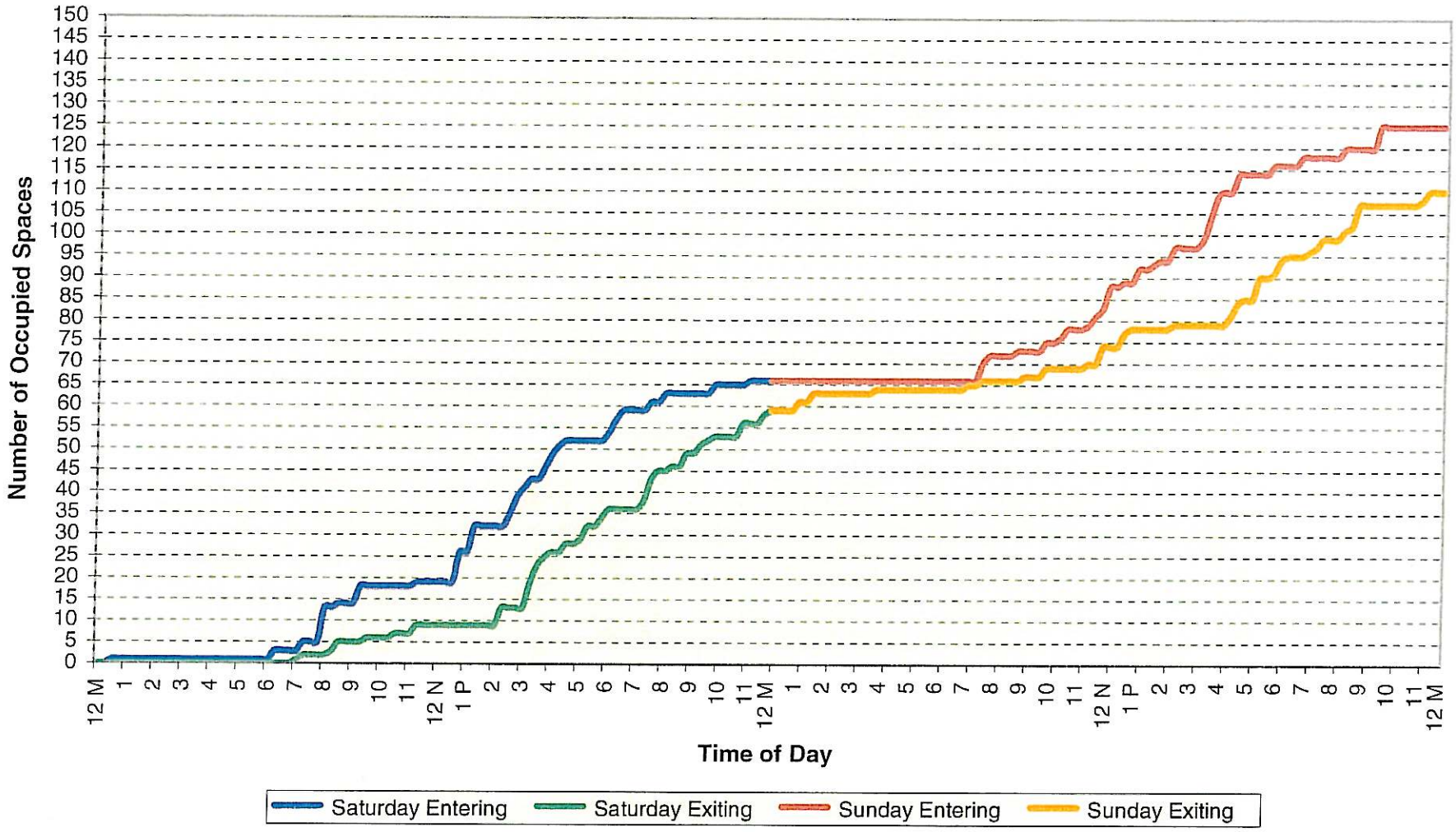
(July 10 and 11, 2004)



Parcel FF Parking Accumulations

Saturday and Sunday

(July 10 and 11, 2004)



Parcel FF Parking Lot Driveway Counts and Calculated Parking Lot Occupancies

Saturday July 10, 2004

Morning

Time Beginning	In	Out	Calculated Accumulation	Observed Occupancy
	"Seed Value"		0	
12:00 AM	0	0	0	
12:15 AM	0	0	0	
12:30 AM	1	0	1	
12:45 AM	0	0	1	
1:00 AM	0	0	1	
1:15 AM	0	0	1	
1:30 AM	0	0	1	
1:45 AM	0	0	1	
2:00 AM	0	0	1	
2:15 AM	0	0	1	
2:30 AM	0	0	1	
2:45 AM	0	0	1	
3:00 AM	0	0	1	
3:15 AM	0	0	1	
3:30 AM	0	0	1	
3:45 AM	0	0	1	
4:00 AM	0	0	1	
4:15 AM	0	0	1	
4:30 AM	0	0	1	
4:45 AM	0	0	1	
5:00 AM	0	0	1	
5:15 AM	0	0	1	
5:30 AM	0	0	1	
5:45 AM	0	0	1	
6:00 AM	0	0	1	
6:15 AM	2	0	3	
6:30 AM	0	0	3	
6:45 AM	0	0	3	
7:00 AM	0	1	2	
7:15 AM	2	1	3	
7:30 AM	0	0	3	
7:45 AM	0	0	3	
8:00 AM	8	0	11	
8:15 AM	0	1	10	
8:30 AM	1	2	9	9
8:45 AM	0	0	9	
9:00 AM	0	0	9	
9:15 AM	4	0	13	
9:30 AM	0	1	12	12
9:45 AM	0	0	12	
10:00 AM	0	0	12	
10:15 AM	0	0	12	
10:30 AM	0	1	11	12
10:45 AM	0	0	11	
11:00 AM	0	0	11	
11:15 AM	1	2	10	
11:30 AM	0	0	10	12
11:45 AM	0	0	10	

Afternoon

Time Beginning	In	Out	Calculated Accumulation	Observed Occupancy
12:00 PM	0	0	10	
12:15 PM	0	0	10	
12:30 PM	0	0	10	12
12:45 PM	7	0	17	
1:00 PM	0	0	17	
1:15 PM	6	0	23	
1:30 PM	0	0	23	18
1:45 PM	0	0	23	
2:00 PM	0	0	23	
2:15 PM	0	4	19	
2:30 PM	3	0	22	17
2:45 PM	4	0	26	
3:00 PM	2	0	28	
3:15 PM	2	6	24	
3:30 PM	0	4	20	19
3:45 PM	3	2	21	
4:00 PM	3	1	23	
4:15 PM	2	0	25	
4:30 PM	1	2	24	20
4:45 PM	0	0	24	
5:00 PM	0	1	23	
5:15 PM	0	3	20	
5:30 PM	0	0	20	
5:45 PM	0	2	18	
6:00 PM	2	2	18	
6:15 PM	3	0	21	
6:30 PM	2	0	23	
6:45 PM	0	0	23	
7:00 PM	0	0	23	
7:15 PM	0	2	21	
7:30 PM	2	5	18	
7:45 PM	0	2	16	
8:00 PM	2	0	18	
8:15 PM	0	1	17	
8:30 PM	0	0	17	
8:45 PM	0	3	14	
9:00 PM	0	0	14	
9:15 PM	0	2	12	
9:30 PM	0	1	11	
9:45 PM	2	1	12	
10:00 PM	0	0	12	
10:15 PM	0	0	12	
10:30 PM	0	0	12	
10:45 PM	0	3	9	
11:00 PM	1	0	10	
11:15 PM	0	0	10	
11:30 PM	0	2	8	
11:45 PM	0	1	7	

Crain & Associates
August 20, 2004
Draft

Parcel FF Parking Lot Driveway Counts and Calculated Parking Lot Occupancies

Sunday ,July 11, 2004

Morning

Time Beginning	In	Out	Calculated Accumulation	Observed Occupancy
12:00 AM	0	0	7	
12:15 AM	0	0	7	
12:30 AM	0	0	7	
12:45 AM	0	2	5	
1:00 AM	0	0	5	
1:15 AM	0	2	3	
1:30 AM	0	0	3	
1:45 AM	0	0	3	
2:00 AM	0	0	3	
2:15 AM	0	0	3	
2:30 AM	0	0	3	
2:45 AM	0	0	3	
3:00 AM	0	0	3	
3:15 AM	0	0	3	
3:30 AM	0	1	2	
3:45 AM	0	0	2	
4:00 AM	0	0	2	
4:15 AM	0	0	2	
4:30 AM	0	0	2	
4:45 AM	0	0	2	
5:00 AM	0	0	2	
5:15 AM	0	0	2	
5:30 AM	0	0	2	
5:45 AM	0	0	2	
6:00 AM	0	0	2	
6:15 AM	0	0	2	
6:30 AM	0	0	2	
6:45 AM	0	1	1	
7:00 AM	0	0	1	
7:15 AM	4	1	4	
7:30 AM	2	0	6	
7:45 AM	0	0	6	
8:00 AM	0	0	6	
8:15 AM	0	0	6	
8:30 AM	1	0	7	
8:45 AM	0	1	6	
9:00 AM	0	0	6	
9:15 AM	0	0	6	
9:30 AM	2	2	6	
9:45 AM	0	0	6	
10:00 AM	1	0	7	
10:15 AM	2	0	9	
10:30 AM	0	0	9	
10:45 AM	0	0	9	
11:00 AM	1	1	9	
11:15 AM	2	0	11	
11:30 AM	2	4	9	
11:45 AM	5	0	14	

Afternoon

Time Beginning	In	Out	Calculated Accumulation	Observed Occupancy
12:00 PM	0	0	14	
12:15 PM	1	3	12	
12:30 PM	0	1	11	
12:45 PM	3	0	14	
1:00 PM	0	0	14	
1:15 PM	1	0	15	
1:30 PM	1	0	16	
1:45 PM	0	0	16	
2:00 PM	3	1	18	
2:15 PM	0	0	18	
2:30 PM	0	0	18	
2:45 PM	0	0	18	
3:00 PM	2	0	20	
3:15 PM	5	0	25	
3:30 PM	5	0	30	
3:45 PM	1	0	31	
4:00 PM	0	2	29	
4:15 PM	4	3	30	
4:30 PM	0	1	29	
4:45 PM	0	0	29	
5:00 PM	0	5	24	
5:15 PM	0	0	24	
5:30 PM	2	1	25	
5:45 PM	0	3	22	
6:00 PM	0	1	21	
6:15 PM	0	0	21	
6:30 PM	2	0	23	
6:45 PM	0	1	22	
7:00 PM	0	1	21	
7:15 PM	0	2	19	
7:30 PM	0	0	19	
7:45 PM	0	0	19	
8:00 PM	2	2	19	
8:15 PM	0	1	18	
8:30 PM	0	5	13	
8:45 PM	0	0	13	
9:00 PM	0	0	13	
9:15 PM	5	0	18	
9:30 PM	0	0	18	
9:45 PM	0	0	18	
10:00 PM	0	0	18	
10:15 PM	0	0	18	
10:30 PM	0	0	18	
10:45 PM	0	1	17	
11:00 PM	0	2	15	
11:15 PM	0	0	15	
11:30 PM	0	0	15	
11:45 PM	0	0	15	

THE TRAFFIC SOLUTION - ADT WORKSHEET

CLIENT: CRAIN & ASSOCIATES
PROJECT: PARCEL FF - MARINA DEL REY
LOCATION: ACCESS DRIVEWAY
DATE: SATURDAY, JULY 17, 2004
FILE NO: A-1

DIRECTION:	ENTRANCE				
TIME	00-15	15-30	30-45	45-60	HOUR TOTALS
00:00	0	0	0	0	0
01:00	0	0	0	0	0
02:00	0	0	0	0	0
03:00	0	0	0	0	0
04:00	0	0	0	0	0
05:00	0	0	0	0	0
06:00	0	2	0	0	2
07:00	0	0	1	0	1
08:00	0	2	0	0	2
09:00	0	0	0	0	0
10:00	0	2	0	3	5
11:00	3	2	5	2	12
12:00	0	1	0	2	3
13:00	2	1	0	0	3
14:00	3	0	2	1	6
15:00	0	3	1	2	6
16:00	3	1	4	2	10
17:00	1	2	0	1	4
18:00	3	0	1	0	4
19:00	1	0	0	0	1
20:00	1	2	0	0	3
21:00	2	0	0	0	2
22:00	1	0	1	1	3
23:00	1	3	0	0	4
				TOTAL	71

AM PEAK HOUR	10:45-11:45
VOLUME	13
PM PEAK HOUR	15:45-14:45
VOLUME	10

DIRECTION:	EXIT				
TIME	00-15	15-30	30-45	45-60	HOUR TOTALS
00:00	0	0	0	0	0
01:00	0	2	0	0	2
02:00	0	0	0	0	0
03:00	0	0	0	0	0
04:00	0	0	0	0	0
05:00	0	0	0	0	0
06:00	0	0	0	0	0
07:00	0	0	1	1	2
08:00	0	0	0	1	1
09:00	0	0	0	0	0
10:00	0	2	0	0	2
11:00	0	2	2	0	4
12:00	0	0	0	0	0
13:00	0	0	0	1	1
14:00	1	0	1	2	4
15:00	0	0	0	4	4
16:00	1	1	2	2	6
17:00	2	1	1	5	9
18:00	0	1	0	6	7
19:00	2	0	0	2	4
20:00	1	2	0	5	8
21:00	4	3	0	0	7
22:00	0	1	1	0	2
23:00	0	0	1	0	1
				TOTAL	64

AM PEAK HOUR	10:45-11:45
VOLUME	4
PM PEAK HOUR	20:30-21:30
VOLUME	12

TOTAL BI-DIRECTIONAL VOLUME	135

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

THE TRAFFIC SOLUTION - ADT WORKSHEET

CLIENT: CRAIN & ASSOCIATES
PROJECT: PARCEL FF - MARINA DEL REY
LOCATION: ACCESS DRIVEWAY
DATE: SUNDAY, JULY 18, 2004
FILE NO: A-2

DIRECTION:	ENTRANCE				
TIME	00-15	15-30	30-45	45-60	HOUR TOTALS
00:00	0	1	2	0	3
01:00	0	0	0	0	0
02:00	0	0	0	0	0
03:00	2	0	0	0	2
04:00	0	0	0	0	0
05:00	0	0	0	0	0
06:00	0	0	0	0	0
07:00	1	0	1	0	2
08:00	2	0	0	0	2
09:00	0	0	0	0	0
10:00	1	0	2	1	4
11:00	2	0	0	0	2
12:00	5	3	0	2	10
13:00	0	0	4	2	6
14:00	2	2	1	0	5
15:00	1	3	1	2	7
16:00	1	2	0	0	3
17:00	2	0	3	0	5
18:00	0	0	1	0	1
19:00	0	0	0	0	0
20:00	0	2	0	0	2
21:00	0	0	0	0	0
22:00	0	2	0	0	2
23:00	0	0	0	0	0
				TOTAL	56

AM PEAK HOUR	10:15-11:15
VOLUME	5
PM PEAK HOUR	12:00-13:00
VOLUME	10

DIRECTION:	EXIT				
TIME	00-15	15-30	30-45	45-60	HOUR TOTALS
00:00	0	0	0	0	0
01:00	0	1	1	0	2
02:00	0	0	0	0	0
03:00	0	1	0	0	1
04:00	0	0	0	0	0
05:00	0	0	0	0	0
06:00	0	0	0	0	0
07:00	0	1	0	0	1
08:00	0	0	0	0	0
09:00	1	0	1	0	2
10:00	2	0	0	0	2
11:00	0	1	1	2	4
12:00	3	0	0	0	3
13:00	0	1	3	0	4
14:00	0	0	0	4	4
15:00	2	0	1	0	3
16:00	2	2	1	2	7
17:00	1	4	0	2	7
18:00	1	1	0	2	4
19:00	0	1	1	0	2
20:00	2	0	1	0	3
21:00	1	1	0	0	2
22:00	0	1	0	0	1
23:00	0	0	0	0	0
				TOTAL	52

AM PEAK HOUR	11:00-12:00
VOLUME	4
PM PEAK HOUR	16:30-17:30
VOLUME	8

TOTAL BI-DIRECTIONAL VOLUME	108

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978

Crain & Associates
August 20, 2004
Draft

Parcel FF Parking Lot Driveway Counts and Calculated Parking Lot Occupancies

Saturday July 17, 2004

Morning

Time Beginning	In	Out	Calculated Accumulation	Observed Occupancy
	"Seed Value"		3	
12:00 AM	0	0	3	
12:15 AM	0	0	3	
12:30 AM	0	0	3	
12:45 AM	0	0	3	
1:00 AM	0	0	3	
1:15 AM	0	2	1	
1:30 AM	0	0	1	
1:45 AM	0	0	1	
2:00 AM	0	0	1	
2:15 AM	0	0	1	
2:30 AM	0	0	1	
2:45 AM	0	0	1	
3:00 AM	0	0	1	
3:15 AM	0	0	1	
3:30 AM	0	0	1	
3:45 AM	0	0	1	
4:00 AM	0	0	1	
4:15 AM	0	0	1	
4:30 AM	0	0	1	
4:45 AM	0	0	1	
5:00 AM	0	0	1	
5:15 AM	0	0	1	
5:30 AM	0	0	1	
5:45 AM	0	0	1	
6:00 AM	0	0	1	
6:15 AM	2	0	3	
6:30 AM	0	0	3	
6:45 AM	0	0	3	
7:00 AM	0	0	3	
7:15 AM	0	0	3	
7:30 AM	1	1	3	
7:45 AM	0	1	2	
8:00 AM	0	0	2	
8:15 AM	2	0	4	
8:30 AM	0	0	4	5
8:45 AM	0	1	3	
9:00 AM	0	0	3	
9:15 AM	0	0	3	
9:30 AM	0	0	3	5
9:45 AM	0	0	3	
10:00 AM	0	0	3	
10:15 AM	2	2	3	
10:30 AM	0	0	3	7
10:45 AM	3	0	6	
11:00 AM	3	0	9	
11:15 AM	2	2	9	
11:30 AM	5	2	12	11
11:45 AM	2	0	14	

Afternoon

Time Beginning	In	Out	Calculated Accumulation	Observed Occupancy
12:00 PM	0	0	14	
12:15 PM	1	0	15	
12:30 PM	0	0	15	14
12:45 PM	2	0	17	
1:00 PM	2	0	19	
1:15 PM	1	0	20	
1:30 PM	0	0	20	16
1:45 PM	0	1	19	
2:00 PM	3	1	21	
2:15 PM	0	0	21	
2:30 PM	2	1	22	19
2:45 PM	1	2	21	
3:00 PM	0	0	21	
3:15 PM	3	0	24	
3:30 PM	1	0	25	25
3:45 PM	2	4	23	
4:00 PM	3	1	25	
4:15 PM	1	1	25	
4:30 PM	4	2	27	27
4:45 PM	2	2	27	
5:00 PM	1	2	26	
5:15 PM	2	1	27	
5:30 PM	0	1	26	
5:45 PM	1	5	22	
6:00 PM	3	0	25	
6:15 PM	0	1	24	
6:30 PM	1	0	25	
6:45 PM	0	6	19	
7:00 PM	1	2	18	
7:15 PM	0	0	18	
7:30 PM	0	0	18	
7:45 PM	0	2	16	
8:00 PM	1	1	16	
8:15 PM	2	2	16	
8:30 PM	0	0	16	
8:45 PM	0	5	11	
9:00 PM	2	4	9	
9:15 PM	0	3	6	
9:30 PM	0	0	6	
9:45 PM	0	0	6	
10:00 PM	1	0	7	
10:15 PM	0	1	6	
10:30 PM	1	1	6	
10:45 PM	1	0	7	
11:00 PM	1	0	8	
11:15 PM	3	0	11	
11:30 PM	0	1	10	
11:45 PM	0	0	10	

Crain & Associates
August 20, 2004
Draft

Parcel FF Parking Lot Driveway Counts and Calculated Parking Lot Occupancies

Sunday July 18, 2004

Morning

Time Beginning	In	Out	Calculated Accumulation	Observed Occupancy
12:00 AM	0	0	10	
12:15 AM	1	0	11	
12:30 AM	2	0	13	
12:45 AM	0	0	13	
1:00 AM	0	0	13	
1:15 AM	0	1	12	
1:30 AM	0	1	11	
1:45 AM	0	0	11	
2:00 AM	0	0	11	
2:15 AM	0	0	11	
2:30 AM	0	0	11	
2:45 AM	0	0	11	
3:00 AM	2	0	13	
3:15 AM	0	1	12	
3:30 AM	0	0	12	
3:45 AM	0	0	12	
4:00 AM	0	0	12	
4:15 AM	0	0	12	
4:30 AM	0	0	12	
4:45 AM	0	0	12	
5:00 AM	0	0	12	
5:15 AM	0	0	12	
5:30 AM	0	0	12	
5:45 AM	0	0	12	
6:00 AM	0	0	12	
6:15 AM	0	0	12	
6:30 AM	0	0	12	
6:45 AM	0	0	12	
7:00 AM	1	0	13	
7:15 AM	0	1	12	
7:30 AM	1	0	13	
7:45 AM	0	0	13	
8:00 AM	2	0	15	
8:15 AM	0	0	15	
8:30 AM	0	0	15	11
8:45 AM	0	0	15	
9:00 AM	0	1	14	
9:15 AM	0	0	14	
9:30 AM	0	1	13	11
9:45 AM	0	0	13	
10:00 AM	1	2	12	
10:15 AM	0	0	12	
10:30 AM	2	0	14	10
10:45 AM	1	0	15	
11:00 AM	2	0	17	
11:15 AM	0	1	16	
11:30 AM	0	1	15	11
11:45 AM	0	2	13	

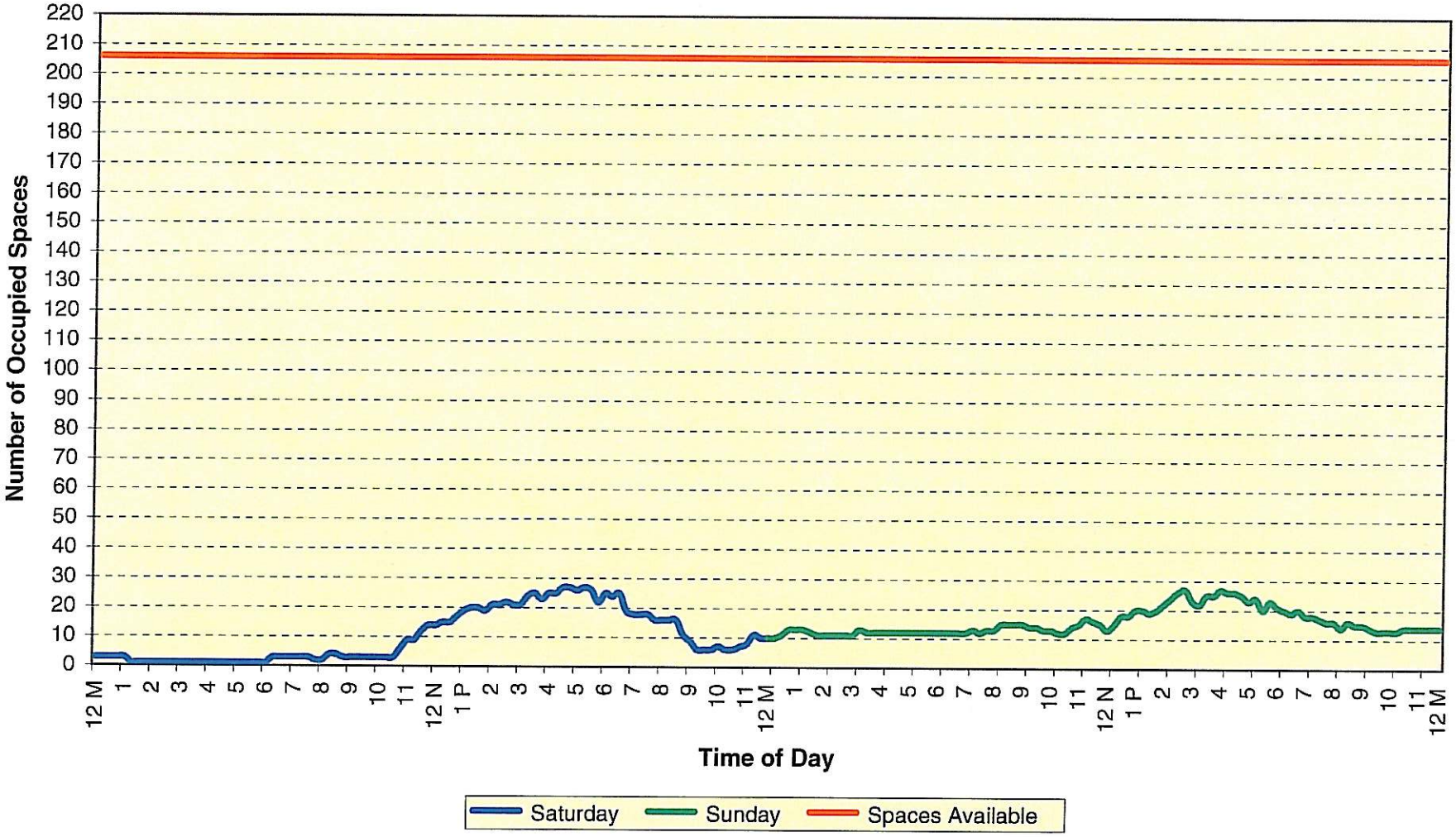
Afternoon

Time Beginning	In	Out	Calculated Accumulation	Observed Occupancy
12:00 PM	5	3	15	
12:15 PM	3	0	18	
12:30 PM	0	0	18	13
12:45 PM	2	0	20	
1:00 PM	0	0	20	
1:15 PM	0	1	19	
1:30 PM	4	3	20	17
1:45 PM	2	0	22	
2:00 PM	2	0	24	
2:15 PM	2	0	26	
2:30 PM	1	0	27	22
2:45 PM	0	4	23	
3:00 PM	1	2	22	
3:15 PM	3	0	25	
3:30 PM	1	1	25	22
3:45 PM	2	0	27	
4:00 PM	1	2	26	
4:15 PM	2	2	26	
4:30 PM	0	1	25	24
4:45 PM	0	2	23	
5:00 PM	2	1	24	
5:15 PM	0	4	20	
5:30 PM	3	0	23	
5:45 PM	0	2	21	
6:00 PM	0	1	20	
6:15 PM	0	1	19	
6:30 PM	1	0	20	
6:45 PM	0	2	18	
7:00 PM	0	0	18	
7:15 PM	0	1	17	
7:30 PM	0	1	16	
7:45 PM	0	0	16	
8:00 PM	0	2	14	
8:15 PM	2	0	16	
8:30 PM	0	1	15	
8:45 PM	0	0	15	
9:00 PM	0	1	14	
9:15 PM	0	1	13	
9:30 PM	0	0	13	
9:45 PM	0	0	13	
10:00 PM	0	0	13	
10:15 PM	2	1	14	
10:30 PM	0	0	14	
10:45 PM	0	0	14	
11:00 PM	0	0	14	
11:15 PM	0	0	14	
11:30 PM	0	0	14	
11:45 PM	0	0	14	

Parcel FF Parking Accumulations

Saturday and Sunday

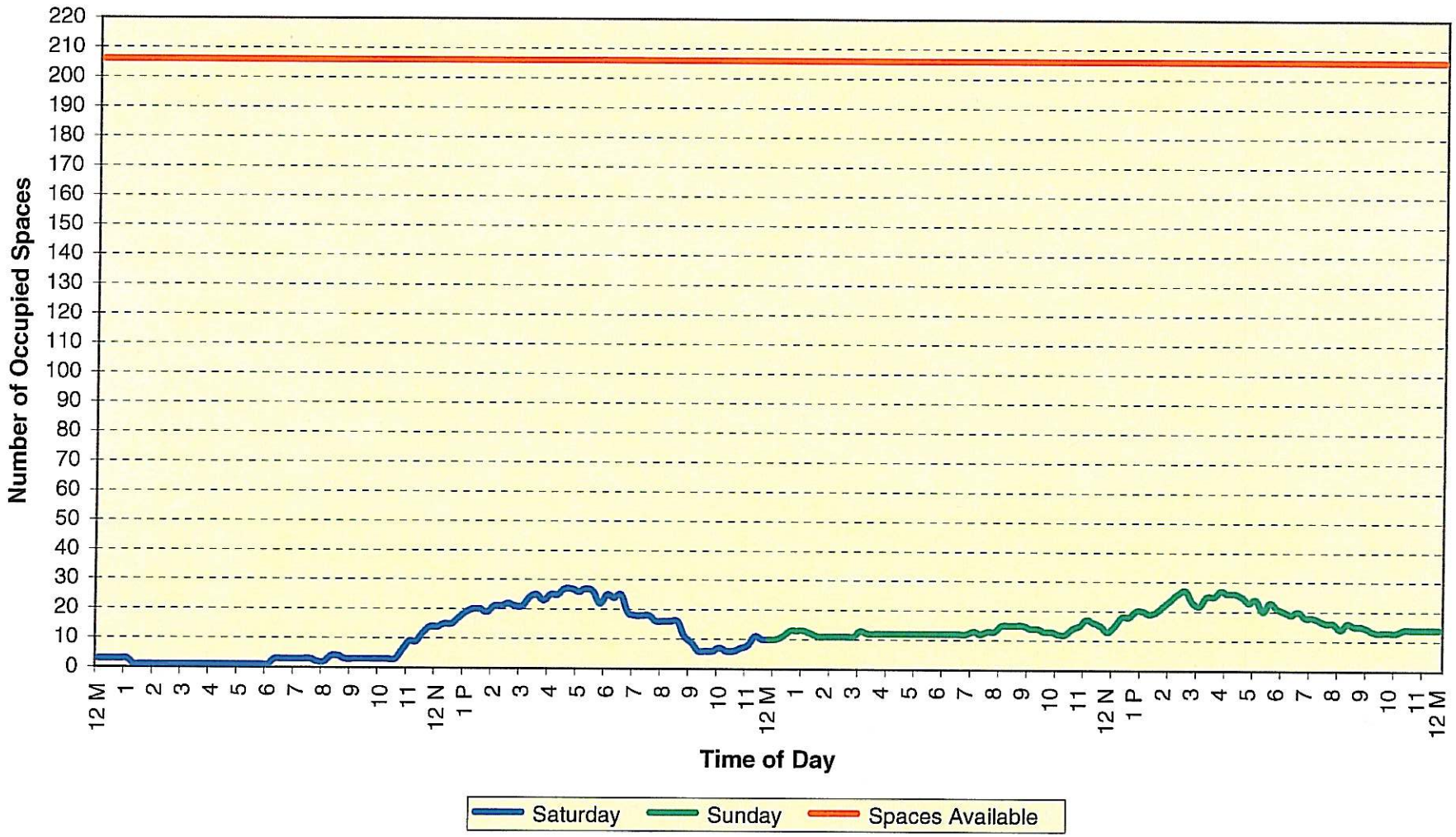
(July 17 and 18, 2004)



Parcel FF Parking Accumulations

Saturday and Sunday

(July 17 and 18, 2004)



Parcel FF Parking Lot 12 Driveway Counts
Observed Residential vs. Marina-Related Parking Activity

Saturday July 10, 2004

Arrival Time	Observed Vehicle Occupant Destination
9:15 AM	Apartments, south side Marquesas Way
9:17 AM	Apartments, south side Marquesas Way
9:30 AM	Apartments, south side Marquesas Way
9:30 AM	Marina boat slips
1:00 PM	Bicycles from car west toward beach
1:24 PM	Apartments, south side Marquesas Way
1:26 PM	Apartments, south side Marquesas Way
2:43 PM	Apartments, west of Via Marina
2:49 PM	Marina boat slips
2:51 PM	Apartments, south side Marquesas Way
3:26 PM	Apartments, west of Via Marina
3:49 PM	Apartments, south side Marquesas Way
3:51 PM	Apartments, south side Marquesas Way
4:03 PM	Apartments, south side Marquesas Way
4:26 PM	Apartments, south side Marquesas Way
4:30 PM	Apartments, south side Marquesas Way

Totals:

Apartment/Resident Activity:	13
Marina/Beach Activity:	3

81% Apartment/Residential Use

Parcel FF Parking Lot 12 Driveway Counts
Observed Residential vs. Marina-Related Parking Activity

Saturday July 17, 2004

Arrival Time	Observed Vehicle Occupant Destination
9:53 AM	Apartments, south side Marquesas Way
10:27 AM	Apartments, south side Marquesas Way
10:52 AM	Marina boat slips
10:58 AM	Apartments, south side Marquesas Way
11:02 AM	Marina (destination unknown)
11:15 AM	Marina (destination unknown)
11:17 AM	Apartments, south side Marquesas Way
11:32 AM	Apartments, south side Marquesas Way
11:34 AM	Marina (destination unknown)
11:40 AM	Marina (destination unknown)
11:55 AM	Apartments, south side Marquesas Way
12:20 PM	Apartments, south side Marquesas Way
1:02 PM	Marina (destination unknown)
1:09 PM	Marina boat slips
1:31 PM	Apartments, south side Marquesas Way
1:40 PM	Apartments, west of Via Marina
2:05 PM	Apartments, west of Via Marina
2:12 PM	Apartments, south side Marquesas Way
2:32 PM	Marina (destination unknown)
2:48 PM	Apartments, west of Via Marina
3:18 PM	Apartments, south side Marquesas Way
3:18 PM	Apartments, south side Marquesas Way
3:22 PM	Apartments, south side Marquesas Way
3:23 PM	Apartments, south side Marquesas Way
3:27 PM	Apartments, south side Marquesas Way
3:36 PM	Marina (destination unknown)
3:50 PM	Apartments, south side Marquesas Way
4:00 PM	Marina boat slips
4:05 PM	Apartments, south side Marquesas Way
4:06 PM	Apartments, south side Marquesas Way
4:24 PM	Marina (destination unknown)

Totals:

Apartment/Resident Activity:	20
Marina/Beach Activity:	11

65% Apartment/Residential Use

Parcel FF Parking Lot 12 Driveway Counts
Observed Residential vs. Marina-Related Parking Activity

Sunday July 18, 2004

Arrival Time	Observed Vehicle Occupant Destination
10:41 AM	Marina/Beach
11:57 AM	Marina boat slips
12:08 PM	Marina boat slips
12:11 PM	Marina boat slips
12:15 PM	Marina (destination unknown)
12:16 PM	Marina (destination unknown)
12:23 PM	Marina (destination unknown)
12:32 PM	Marina (destination unknown)
12:49 PM	Marina (destination unknown)
12:58 PM	Marina (destination unknown)
1:14 PM	Marina boat slips
1:40 PM	Marina boat slips
1:41 PM	Apartments, south side Marquesas Way
1:41 PM	Apartments, south side Marquesas Way
1:58 PM	Marina (destination unknown)
2:14 PM	Apartments, south side Marquesas Way
2:22 PM	Marina (destination unknown)
2:44 PM	Marina (destination unknown)
3:07 PM	Apartments, south side Marquesas Way
3:24 PM	Apartments, south side Marquesas Way
3:31 PM	Marina (destination unknown)
3:38 PM	Apartments, south side Marquesas Way
3:47 PM	Marina boat slips
3:48 PM	Marina boat slips
3:49 PM	Marina (destination unknown)
4:00 PM	Marina boat slips
4:07 PM	Apartments, south side Marquesas Way
4:18 PM	Apartments, west of Via Marina

Totals:

Apartment/Resident Activity:	8	29% Apartment/Residential Use
Marina/Beach Activity:	20	

Grand Totals:

Apartment/Resident Activity:	*41*	*55% Apartment/Residential Use*
Marina/Beach Activity:	*34*	

FIGURE 3

COUNTY OWNED PUBLIC PARKING LOTS[1]

Lot	Parcel	Address	Capacity	Remarks
1	W	13737 Fiji Way	483[2]	Fisherman's Village
2	49R	13477 Fiji Way	466[3]	Public Parking/Launch Ramp
4	49M	13500 Mindanao Way	124	Overflow -- Chace Park
5	UR	4545 Admiralty Way	240	Marina Shopping Center
6	SS	4500 Admiralty Way	115	Overflow MdR Hotel, Other
7	Q	4350 Admiralty Way	118	Admiralty Park -- Turf
8	OT	4220 Admiralty Way	186	Admiralty Park -- Paved
9	N	14101 Palawan Way	191	Overflow -- Beach, Int'l. Hotel, Other
10	IR	4101 Admiralty	216	Beach, Overflow
11	GR	14101 Panay Way	264	Beach
12	FF	14151 Marquesas Way	207	Beach, Overflow
13	3	4601 Via Marina	140	Overflow - Pierview Cafe
14	A	4601 Via Marina	60[4]	Channel Vista, Overflow
15	LLS	4001 Via Marina	10	Channel Vista
16	EE	13650 Mindanao	60[5]	Chace Park
17	83	13399 Fiji Way	13[6]	
	52	13051 Fiji Way	245	Temporary Parking
		TOTAL	3,138	

Source: Los Angeles County Department of Beaches and Harbors, *County Owned Public Parking Lots*, April 3, 1990.

User Fees

[1] Parking fees range from $1.00 to $5.00 per 24 hour period except Lot 7 which is $.50.

[2] Special AMPCO validation system.

[3] Fee of $4.00 charge for car and trailer, includes parking. Capacity is 233 with combination boat and trailer.

[4] Metered, 25 cents each hour.

[5] Metered, 25 cents per hour.

[6] No charge. Permittee pays in lieu fee.

APPENDIX 5.8

Sewer Service

SEWER CAPACITY REPORT

NEPTUNE MARINA

Marina del Rey, CA

Prepared for:

LEGACY PARTNERS

30 Executive Park, Suite 100
Irvine, CA 92614

Project Manager:
John Olivier

Date Prepared: March 2004
JN: 424.14.01

Prepared by:

FUSCOE ENGINEERING, INC.

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1.2 Site Description 1

1.3. Proposed Development 1

Vicinity Map 3

II. Existing Sewer System 4

III. Proposed Sewer Improvements 6

IV. Conclusion 6

V. Appendices

Appendix 1 – Sewer ALTAS Map – Los Angeles County

Appendix 2 – Sewer Flow Analysis

Appendix 3 – Sewer Capacity Calculations

Appendix 4 – Conceptual Sewer Plan (Map Pocket)

I. Introduction

1.1 Purpose of the Study

The objective of this analysis is to compare and calculate the sanitary sewer flows for the existing and proposed conditions that would include new apartment buildings, a park and hotel for the project site in Marina Del Rey, California. The report will be provided to the County of Los Angeles Department of Public Works for review and analysis of the existing infrastructure.

1.2 Site Description

Please refer to Figure 1, Vicinity Map.

PARCEL 10R

Parcel 10R, the existing Neptune Marina, is in the 37th year of a 60 year lease from Los Angeles County, which is due to expire in 2022. The property consists of 7.33 acres of land area and 4.68 acres of water area for a total of 12.01 acres. This site was developed in 1966 and currently consists of 136 low-rise two story residential apartments and 198 boat slips. A Phase I Environmental Site Assessment was prepared for this site in October 2003.

PARCEL FF

Parcel FF is an unleased 2.06 acre rectangular-shaped parcel. This parcel, designated in the Local Coastal Plan (LCP) as a park site, is currently serving as a parking lot.

PARCEL 9U

Parcel 9U, a 3.67 acre parcel, is vacant and to our understanding this parcel is not leased. This site appears to have remnants of shoring and/or steel piles that were to be used for planned construction of a hotel. A Phase I and Phase II Environmental Site Assessment were prepared on the site in July and October 1996, respectively.

1.3 Proposed Development

PARCEL 10R AND FF

RESIDENTIAL COMPONENT: The residential component for Neptune Marina applies to Parcel 10R and FF. It consists of 5 buildings, 4 stories each, over structured parking. The proposed project is anticipated to include a total of 527 luxury rental apartment units, ranging from 654 square feet to 1,650 square feet. The proposed units will include 1 bedroom/1 bath, 2 bedroom/2 bath, and 3 bedroom/2 bath units with private balconies or decks.

MARINA COMPONENT: The marina component applies only to Parcel 10R. The proposed redevelopment of the existing marina slips is planned to adapt to commercially

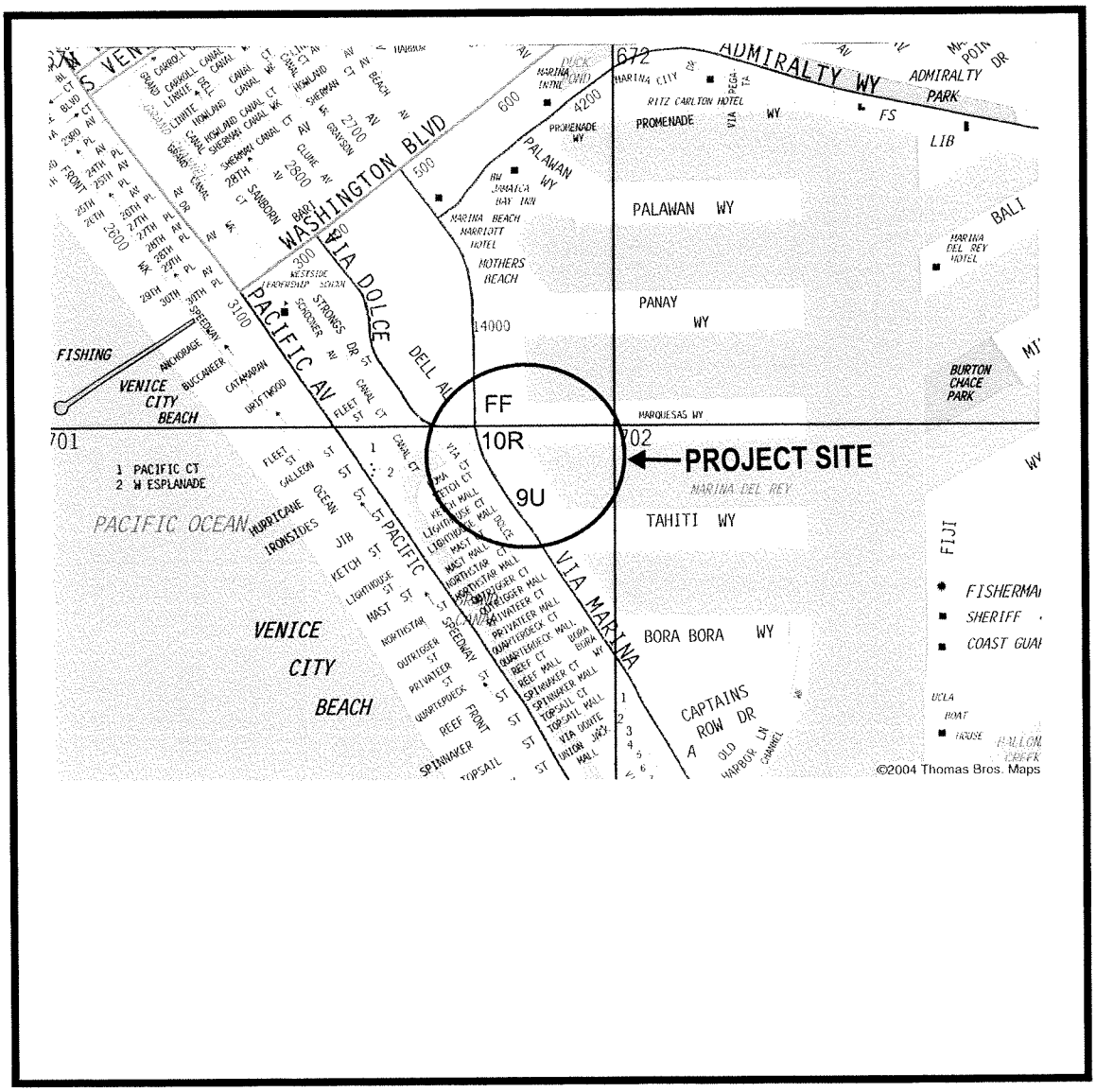
available or custom designed dock systems in concrete. Slip widths are based on power boat beams, allowing for the flexibility of berthing either sail or power boats in any given slip length. The average slip length is 36.70, which was based on the selection of Option 2-B as prepared by the marina consultant, Cash & Associates. The total slip count proposed is 141 with 5,175 feet of linear rental footage.

PARCEL 9U

HOTEL COMPONENT: The Marina del Rey Woodfin Suite Hotel is to be located on 1.67 acres of Parcel 9U and will have 288 suites. Vehicular access will be from Tahiti Way. The hotel includes an exterior pool and spa with a large deck. Supplemental decks and walkways will feature extensive landscaping and fountains.

The total building square footage for the Woodfin Suite Hotel, including both public and private areas, is 213,000 square feet. The plan is based on one parking stall per two rooms, with 20 spaces being provided for employee parking. The total number of parking spaces provided for the hotel, both on grade and subterranean, is 185.

PARK COMPONENT: The proposed park will cover 2.00 acres of Parcel 9U, which will provide open space that would link the marina and promenade to the community street system. Vehicular access will be from Via Marina. The park includes an 8 car parking area, open turf play and lawn areas for resort hotel functions, a sand volleyball court, picnic pads for tables and possible barbecues, and a "looping" walkway system.



VICINITY MAP

Figure 1

II. Existing Sewer System

2.1 Parcels 10R, FF and 9U

Parcels 10R, FF and 9U are served by an existing County of Los Angeles Sewer System, PC 3668, which serves the marina area. The sewer main is within a utility easement dedicated to the County of Los Angeles. The Department of Public Works (DPW) Waterworks and Sewer Maintenance Division handles the maintenance of the sewer system, which is regulated in the Marina Sewer Maintenance District (MSMD).

A portion of the sewer through Parcel 9U has been abandoned and relocated per PC 10063. The sewage in relocated lines joins a sewer in Via Marina (CC 8216). Both the marina area system and the sewer in Via Marina join an 18" RCP that crosses from County to City of Los Angeles. (Appendix 1)

The system discharges to the City of Los Angeles system through a metering station at Hurricane Street and Strongs Drive. Sewage is pumped via a pump station at Hurricane Street and Esplanade. The pump station has 5 pumps, 3 running and 2 stand-by. The station has a capacity of 39,000 GPM and is currently operating at maximum capacity. There is a proposal for a new parallel force main system to provide relief for the existing Coastal Interceptor Sewer (CIS) System.

Once through the pump station, sewage flows within the City of Los Angeles via the Coastal Interceptor Sewer to the Hyperion Treatment Plan near Imperial Highway. The marina area holds contractual flow rights, purchased from the city, for use in pipe and pumping systems, as well as treatment at Hyperion. Payment for these rights is based on the proportionate share of capital costs and annual costs for the system used, based on the relation of its contractual capacity to the design capacity of the system.

The MSMD has a 0.97 mgd (million gallon per day) purchased capacity right to Hyperion. The system was designed to serve 3.0 mgd. Hence, the remaining 2.13 mgd that was allocated to MSMD could be purchased at their current rate capacity, if required.

III. Proposed Sewer Improvements

3.1 Proposed Improvements

The proposed improvements require the abandonment of approximately 1,040 lf of existing 10" sewer main. Due to the location of the hotel and three apartment buildings over the current alignment. Approximately 175 lf of existing 8" sewer main will need to be abandoned and relocated at the hotel site (See Appendix 4).

Approximately 600 lf of 10" sewer will be built at the apartment site due to the abandonment/relocation of the existing sewer. The existing 8" sewer that parallels the Basin 'B' bulkhead will be extended as a 10" to within Via Marina then northerly in Via Marina to the 15" that crosses Via Marina. Two new manholes will be constructed. Building laterals will be constructed from each new apartment building to the existing or proposed sewers as shown conceptually on the Conceptual Sewer Plan (Appendix 4).

About 210 lf of 8" sewer will be constructed at the hotel site due to relocation from beneath the building footprint. The newer sewer will be built approximately 30 feet east of its existing location within an existing easement and connected to the existing sewers. Two new manholes will be required. The hotel will connect to the sewer either at the new manhole south of Basin 'B' or to the sewer in Tahiti Way.

IV. Conclusion

4.1 Conclusion

The existing capacity calculations for the 15" sewers and 12" sewer main are provided at the end of this report. Based on d/D of 0.5, the capacity of the 15" sewer main in Via Marina is 1.44cfs. The capacity of the 15" sewer main north of the site is 1.71cfs. The capacity of the 12" main in Tahiti Way is 0.94cfs. As-built drawings were used to obtain the slopes used in the calculations (See Appendix 3).

The proposed change in peak flow for the apartment site is 0.57cfs over existing flow taking into account the demolition of the existing apartments.

The peak flow for the Woodfin Suite Hotel that drains to the 12" sewer in Tahiti Way is 0.23cfs. The proposed sewer flow discussed here is <u>only</u> that due to the new development and does not reflect any existing flows from off-site (See Appendix 2).

The following items need to be addressed:

- Existing flow measurements in both 15" mains and the 12" main upstream of the proposed developments.
- Capacity of pump station at Hurricane Street and Esplanade.
- Current purchased rights of 0.97 mgd by MSMD for the Hyperion Treatment Plan.

4.2 Contact List

- Los Angeles County Department of Public Works
  Massoud Esfahani
  Building and Safety/Land Development Division
  (626) 458-3824

- City of Los Angeles
  Fred Sangalang
  Bureau of Engineering
  Wastewater Conveyance Engineering Division
  (213) 847-9585

V. Appendices

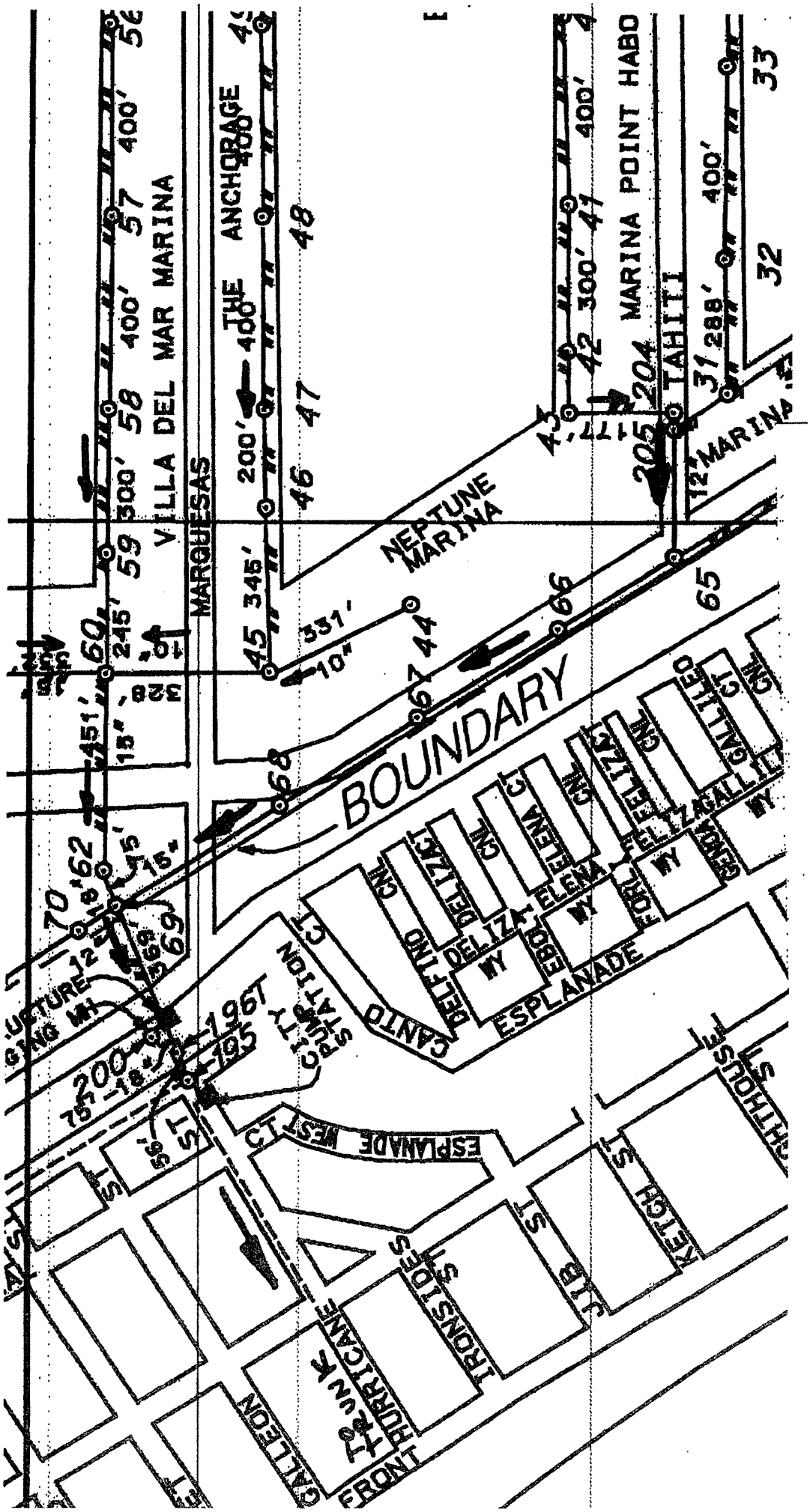
Appendix 1 – Sewer ALTAS Map – Los Angeles County

Appendix 2 – Sewer Flow Analysis

Appendix 3 – Sewer Capacity Calculations

Appendix 4 – Conceptual Sewer Plan (Map Pocket)

Appendix 1


VILLA DEL MAR MARINA
THE ANCHORAGE
MARINA POINT HABO
TAHITI
MARINA
NEPTUNE MARINA
MARQUESAS
BOUNDARY
ESPLANADE
ESPLANADE WEST
CANTO
DELFINO
DELIZA
ELENA
FELIZ
GALLEO
GALLIVAT
FRONT
HUNTINGTON
GALLEON
FRONTSIDES
KETCH
JIB
ST
CT
CNL
WY
400'
300'
200'
345'
331'
288'
245'
228'
451'
10"
12"
15"
1967
1965
200
75'-18"
56'
70
69
68
67
66
65
62
60
59
58
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48
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32
31
204
205

Appendix 2

NEPTUNE MARINA
SEWER FLOW ANALYSIS

APARTMENTS				
BUILDING	1 BDRM	2 BDRM	3 BDRM	PERSONS
1	62	28	8	209
2	62	28	8	209
3	48	64	7	288
4	48	22	6	162
5	88	42	6	282
			TOTAL	1150

EXISTING APTS. – DEMO 136 APTS.		
	ROOMS	PERSONS
2 BDRM	136	408
	TOTAL	408

EQUATION:

1150-408 = 742 MORE PERSONS
AVE. FLOW (cfs) = PERSONS x (90gal/day) x (1day/24hr) x (1hr/3600sec.) x (1cu. ft./7.48gal)
AVE. FLOW (cfs) = 742 x 0.00013926
AVE. FLOW (cfs) = 0.10333092
PEAK FLOW (cfs) = 1.5 x 0.10333092
PEAK FLOW (cfs) = 0.154996

WOODFIN SUITE HOTEL			
	1 BDRM	2 BDRM	PERSONS
	228	60	522
		TOTAL	522

EQUATION:

AVE. FLOW (cfs) = PERSONS x (90gal/day) x (1day/24hr) x (1hr/3600sec.) x (1cu. ft./7.48gal)
AVE. FLOW (cfs) = 522 x .00013926
AVE. FLOW (cfs) = 0.07269372
PEAK FLOW (cfs) = 1.5 x 0.07269372
PEAK FLOW (cfs) = 0.109041

ASSUMPTIONS:
APARTMENTS

1 BDRM = 1.5 PERSONS
2 BDRM = 3.0 PERSONS
3 BDRM = 4.0 PERSONS

Use 90gal/day
Peaking Factor = 1.5

HOTEL

1 BDRM = 1.5 PERSONS
2 BDRM = 3.0 PERSONS

Appendix 3

Capacity of 15" SS in Via Marina
Worksheet for Circular Channel

Project Description	
Worksheet	Circular Channel
Flow Element	Circular Channel
Method	Manning's Formu
Solve For	Discharge

Input Data		
Mannings Coeffic	0.013	
Slope	002000	ft/ft
Depth	0.63	ft
Diameter	15	in

Results		
Discharge	1.44	cfs
Flow Area	0.6	ft²
Wetted Perime	1.96	ft
Top Width	1.25	ft
Critical Depth	0.48	ft
Percent Full	50.0	%
Critical Slope	0.005289	ft/ft
Velocity	2.35	ft/s
Velocity Head	0.09	ft
Specific Energ	0.71	ft
Froude Numbe	0.59	
Maximum Disc	3.11	cfs
Discharge Full	2.89	cfs
Slope Full	0.000500	ft/ft
Flow Type	Subcritical	

Capacity of 12" VCP in Tahiti Way
Worksheet for Circular Channel

Project Description	
Worksheet	Circular Channel
Flow Element	Circular Channel
Method	Manning's Formu
Solve For	Discharge

Input Data		
Mannings Coeffic	0.013	
Slope	002800	ft/ft
Depth	0.50	ft
Diameter	12	in

Results		
Discharge	0.94	cfs
Flow Area	0.4	ft²
Wetted Perime	1.57	ft
Top Width	1.00	ft
Critical Depth	0.41	ft
Percent Full	50.0	%
Critical Slope	0.005773	ft/ft
Velocity	2.40	ft/s
Velocity Head	0.09	ft
Specific Energ	0.59	ft
Froude Numbe	0.68	
Maximum Disc	2.03	cfs
Discharge Full	1.89	cfs
Slope Full	0.000700	ft/ft
Flow Type	Subcritical	

Capacity of 15" VCP North of Site
Worksheet for Circular Channel

Project Description	
Worksheet	Circular Channel
Flow Element	Circular Channel
Method	Manning's Formu
Solve For	Discharge

Input Data		
Mannings Coeffic	0.013	
Slope	002800	ft/ft
Depth	0.63	ft
Diameter	15	in

Results		
Discharge	1.71	cfs
Flow Area	0.6	ft²
Wetted Perime	1.96	ft
Top Width	1.25	ft
Critical Depth	0.52	ft
Percent Full	50.0	%
Critical Slope	0.005380	ft/ft
Velocity	2.79	ft/s
Velocity Head	0.12	ft
Specific Energ	0.75	ft
Froude Numbe	0.70	
Maximum Disc	3.68	cfs
Discharge Full	3.42	cfs
Slope Full	0.000700	ft/ft
Flow Type	Subcritical	

Sewer Pipes Report ◀ Back

Pipe ID	5611112456111064A
Basin	C03
Upstream Invert	-6.56
Downstream Invert	-8.03
Length	368.1
Slope	0.004
Size	18
Width	0
Material	VCP
Shape	CR
Street	GRAND CANAL R/W
Block	3900
Liner	
Upstream Stationing	5 + 43.1
Downstream Stationing	1 + 75
Month / Year Installed	07 / 1959
Number of Laterals	0
Gravity or Force Main	GR
Comments	
Number of Wyes	0
Plan Number	D-25216
Supp Plan Number	Undefined
Profile Number	D-25216
Pipe Status	ACTIVE
Pipe Ownership	Undefined
Wye Card Number	7191-6
Calculated Capacity	6.16898
Engineering District	W
Rehabilitated	N

SLOPE OF 18" VCP TO CITY OF LOS ANGELES

Please read our Disclaimer.

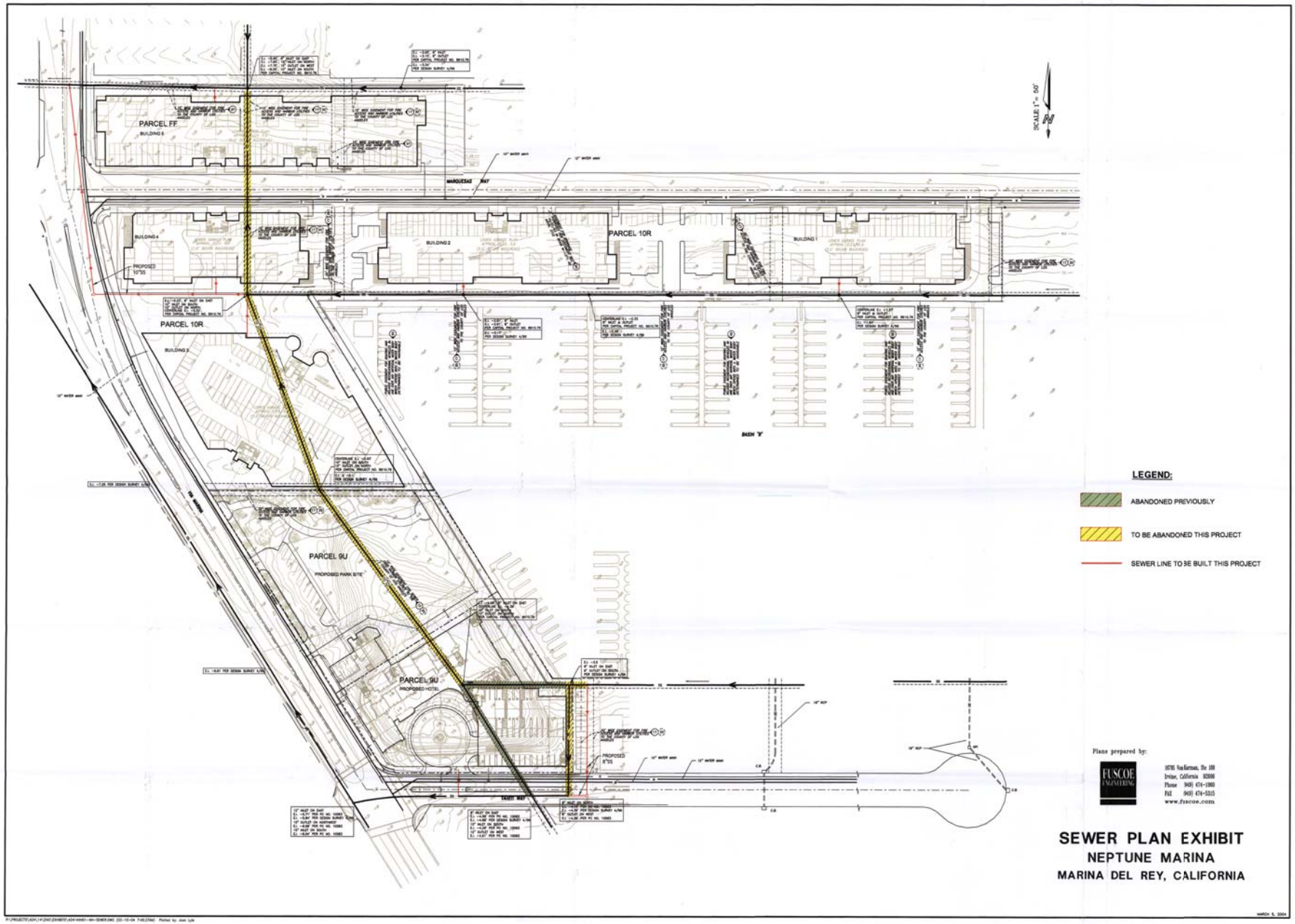
Capacity of 18" SS to City of Los Angeles
Worksheet for Circular Channel

Project Description	
Worksheet	Circular Channel
Flow Element	Circular Channel
Method	Manning's Formu
Solve For	Discharge

Input Data		
Mannings Coeffic	0.013	
Slope	004000	ft/ft
Depth	0.75	ft
Diameter	18	in

Results		
Discharge	3.32	cfs
Flow Area	0.9	ft²
Wetted Perime	2.36	ft
Top Width	1.50	ft
Critical Depth	0.69	ft
Percent Full	50.0	%
Critical Slope	0.005212	ft/ft
Velocity	3.76	ft/s
Velocity Head	0.22	ft
Specific Energ	0.97	ft
Froude Numbe	0.86	
Maximum Disc	7.15	cfs
Discharge Full	6.64	cfs
Slope Full	0.001000	ft/ft
Flow Type	Subcritical	

Appendix 4


SCALE 1" = 50'
N
PARCEL FF
BUILDING 5
MARQUESAS WAY
BUILDING 4
PROPOSED 10'S5
BUILDING 2
PARCEL 10R
BUILDING 1
PARCEL 10R
BUILDING 3
BASIN 'F'
PARCEL 9U
PROPOSED PARK SITE
PARCEL 9U
PROPOSED HOTEL
PROPOSED 8'S5
TAHITI WAY
LEGEND:
ABANDONED PREVIOUSLY
TO BE ABANDONED THIS PROJECT
SEWER LINE TO BE BUILT THIS PROJECT
Plans prepared by:
FUSCOE ENGINEERING
16795 Von Karman, Ste 100
Irvine, California 92606
Phone (949) 474-1960
FAX (949) 474-5315
www.fuscoe.com
SEWER PLAN EXHIBIT
NEPTUNE MARINA
MARINA DEL REY, CALIFORNIA
MARCH 5, 2004

Sewer Area Study Report
For
Woodfin Suite Hotel

City of Marina Del Rey
Los Angeles County, California

Hunsaker Project No:
0084-001-001
Prepared: July 21, 2006

Woodfin Suite Hotel
12730 High Bluff Drive
San Diego, California 92130

Prepared by:

Hunsaker & Associates, Los Angeles, Inc.
26074 Avenue Hall Suite 22
Valencia CA 91355
Telephone: (661) 294-2211 Fax: (661) 294-9890

Under the direction of:

Jason H. Fukumitsu, P.E. RCE 40695 Exp: 03/13/07

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   1.2 Report Summary Page 5

2. METHODOLOGY Page 6

3 EXISTING SEWER SYSTEM Page 6

4. IMPACT OF PROPOSED PROJECT TO THE EXISTING SEWER SYSTEM

   4.1 Sewer Generation based on the County of Los Angeles Standards Page 6

   4.2 Sewer Generation based on the City of Los Angeles Standards Page 7

   4.3 Manhole 65 to 66 Page 7

   4.4 Manhole 66 to 67 Page 7

   4.5 Manhole 68 to 69 Page 7

   4.6 Manhole 69 to Metering Structure Page 7

5. CONCLUSIONS AND RECOMENDATIONS Page 8

6. TABLES

   Table 6.1: Proposed Sewage Flow Calculation Summary by County of Los Angeles standards

   Table 6.2: Proposed Sewage Flow Calculation Summary by City of Los Angeles standards

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7. EXHIBITS

Exhibit 7.1: Woodfin Suite Hotel Site Plan

Exhibit 7.2: Woodfin Suite Hotel Ground Floor Plan

Exhibit 7.3: Woodfin Suite Hotel 2nd Floor Plan

Exhibit 7.4: Woodfin Suite Hotel 3rd Floor Plan

Exhibit 7.5: Woodfin Suite Hotel 4th Floor Plan

Exhibit 7.6: Woodfin Suite Hotel 5th Floor Plan

8. APPENDICES

A: Los Angeles County Estimated Average Daily Sewage Flows for Various Occupancies

B: City of Los Angeles Sewage Generation Factors for Residential and Commercial Categories

C: Los Angeles County Flow Diagram for the Design of Circular Sanitary Sewers

D: Private Contract No. 10063, Marina Del Rey

E: Private Contract No. 8183, Marina Del Rey

F. Cash Contract No. 8216, Marina Del Rey

G. Capital Project No. 8910.76, Marina Del Rey (Page 60)

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9.2 Design capacity of 15” V.C.P. from Manhole 66 to 67

9.3 Design capacity of 15” V.C.P. from Manhole 67 to 68

9.4 Design capacity of 15” V.C.P. from Manhole 68 to 69

9.5 Design capacity of 18” V.C.P. from Manhole 69 to Metering Structure

9.6 Proposed Sewer Pipe Design Capacity from Parcel 9U to Existing 15" Sewer Line

1. INTRODUCTION

1.1 Project Description

Woodfin Suite Hotel is proposing to construct a 19-story hotel development on Parcel 9U in the City of Marina Del Rey. The proposed hotel is in the City of Marina Del Rey, and the site is located between north of Tahiti Way and west of Basin B in Marina Del Rey. Via Marina runs along the west side of the project site and an existing residential development, Neptune Marina Apartments, is north of the site. The City of Los Angeles boundary lies west of Via Marina, approximately 29' from the center of the street.

The proposed hotel will occupy 3.66 acres of land and will have 288 rooms, of which 136 of them will be timeshare apartment dwellings and the remaining 152 will serve only as hotel guest rooms. In addition, a restaurant will also be included in the development.

1.2 Report Summary

This Sewer Area Study report will serve to investigate the cumulative impact of the proposed development to the existing sewer system. The report is divided into several sections, and is described as follows:

Section 1 presents the summary and description of the project

Section 2 presents the methodology used in the proposed sewer area study

Section 3 presents the analysis of the existing sewer system

Section 4 discusses the impact of the proposed development to the existing sewer system

Section 5 discusses the conclusions and its impact and offers recommendations to the existing sewer system and any improvements if necessary.

Section 6 presents the table of summary describing the proposed sewage flows

Section 7 presents architectural exhibits of the proposed development

Section 8 presents the reference tables and graphs used in the engineering design of the proposed development

Section 9 presents the calculation reports for the design capacity of the sewer system

2. METHODOLOGY

The proposed sewage flows were computed based on the Los Angeles County Estimated Average Daily Sewage Flows for Various Occupancies for Sewer Area Studies. Existing documents and sewer plans were also researched and collected in order to find out the location of the sewer pipes and their maximum design capacity (See Appendix).

The impact of the proposed development will be dependent on the increased sewage arising from the hotel's activities and the capacity of the existing sewer system. The increase between the existing and proposed sewage flows will later be used to determine whether an upgrade of the existing sewer system is required.

Sewage from the proposed hotel will be conveyed through a new proposed sewer line that will connect to the existing 15" V.C.P., located along Via Marina, before it meets the existing 18" V.C.P. at manhole 69, and finally to the Venice Pumping Station between Canal Court and Hurricane Street.

3. EXISTING SEWER SYSTEM

Along Via Marina, an existing 15" V.C.P. connects to from manhole 65 to manhole 69, between Marquesas Way and Via Dolce. From manhole 69, an 18" V.C.P. connects to manhole 195 through a Metering Structure and Gauging manhole (manhole 200) and continues to the City of Los Angeles Pumping Station (Sewer Area Study for Del Rey Shores Apartments, Los Angeles County, CA, PSOMAS, August 2, 2005).

4. IMPACT OF PROPOSED PROJECT TO THE EXISTING SEWER SYSTEM

The proposed development is located within the County of Los Angeles. Since sewage flows will be conveyed to the Venice Pumping Station (located in the City of Los Angeles) a comparison of the sewer flow generated based on the County of Los Angles' as well as the City of Los Angeles' standards is required.

4.1 Sewage Generation based on County of Los Angeles' standards

Sewage computations of the proposed development show a Peak Daily Flow of 0.240 ft^3/sec. Since no existing development currently resides on Parcel 9U and no additional sewage enters the existing sewer system on site, the net sewage increase from the development is only 0.240 ft^3/sec.

4.2 Sewage Generation based on City of Los Angeles' standards

Sewage computations of the proposed development show a Peak Daily Flow of 0.170 ft^3/sec. The results are much lower than the flows generated by the County's standards and should be considered when sizing the proposed new sewer line.

Details of the sewer line from the following manholes are based on Cash Contract No. 8216, and Capital Project No. 8910.76 (Kutter's Formula with n=0.013 was used to analyze the design capacity of the sewer pipe while flowing at ¾ full):

4.3 Manhole 65 to 66

The existing sewer line from manhole to 65 to 66 along Via Marina is in the County of Los Angeles and is a 253 feet long 15" V.C.P. It has a slope of 0.24 % and a design capacity of 2.59 ft^3/sec.

4.4 Manhole 66 to 67

The sewer line continues from manhole 66 to 67 along Via Marina as a 350 feet long 15" V.C.P. It's slope remains as 0.24 % and has a design capacity of 2.59 ft^3/sec.

4.4 Manhole 67 to 68

From manhole 67 to 68, the existing 15" V.C.P continues at a slope of 0.28 % for 350 feet. Analysis shows a design capacity of 2.80 ft^3/sec.

4.5 Manhole 68 to 69

The 15" V.C.P. sewer line from manhole 68 meets at a slope of 0.28 % to manhole 69 and has a design capacity of 2.85 ft^3/sec.

4.6 Manhole 69 to Metering Structure

The City of Los Angeles boundary is approximately 25 feet west of manhole 69. The existing sewer line from manhole 69 crosses the City's boundary and into the metering structure as a 364 feet long 18" V.C.P. with a slope of 0.4 %. Analysis of this pipe segment shows that the design capacity is 5.570 ft^3/sec

5. CONCLUSIONS AND RECOMMENDATIONS

A proposed sewer pipe from the new development will connect to the 15" V.C.P along Via Marina before finally discharging at the Venice Pumping Station.

Current analysis on the proposed development shows that if maintained at 0.24%, a 10" V.C.P. is sufficient to handle the discharge of 0.240 ft^3/sec arising from the proposed development. At 37 % full, the pipe will flow below maximum capacity before it connects to the existing 15" V.C.P. sewer line at Via Marina.

On the advice of Mr. Tony G. Khalkhali, P.E. from the Los Angeles County Department of Public Works' (LACDPW) Land Development Division, a detailed inspection and analysis of the existing flows in the sewer pipes and manholes, size and number of each facility, etc. are recommended to support the proposed new sewer system. However, such an analysis requires a significant effort, and the results would only be theoretical. It is highly recommended instead, to conduct flow measurements of the sewer pipes and manholes to prove that the increase in net sewage will not exceed the existing sewer system capacity.

Lastly, the LACDPW is preparing to perform a Master Sewer Area Study for the City of Marina Del Rey in the near future, and prior notice of this proposed project and the submittal of the sewer report would facilitate their plans.

TABLES

Table 6.1: Proposed Sewage Flow Calculation Summary by County of Los Angeles standards

Proposed Condition

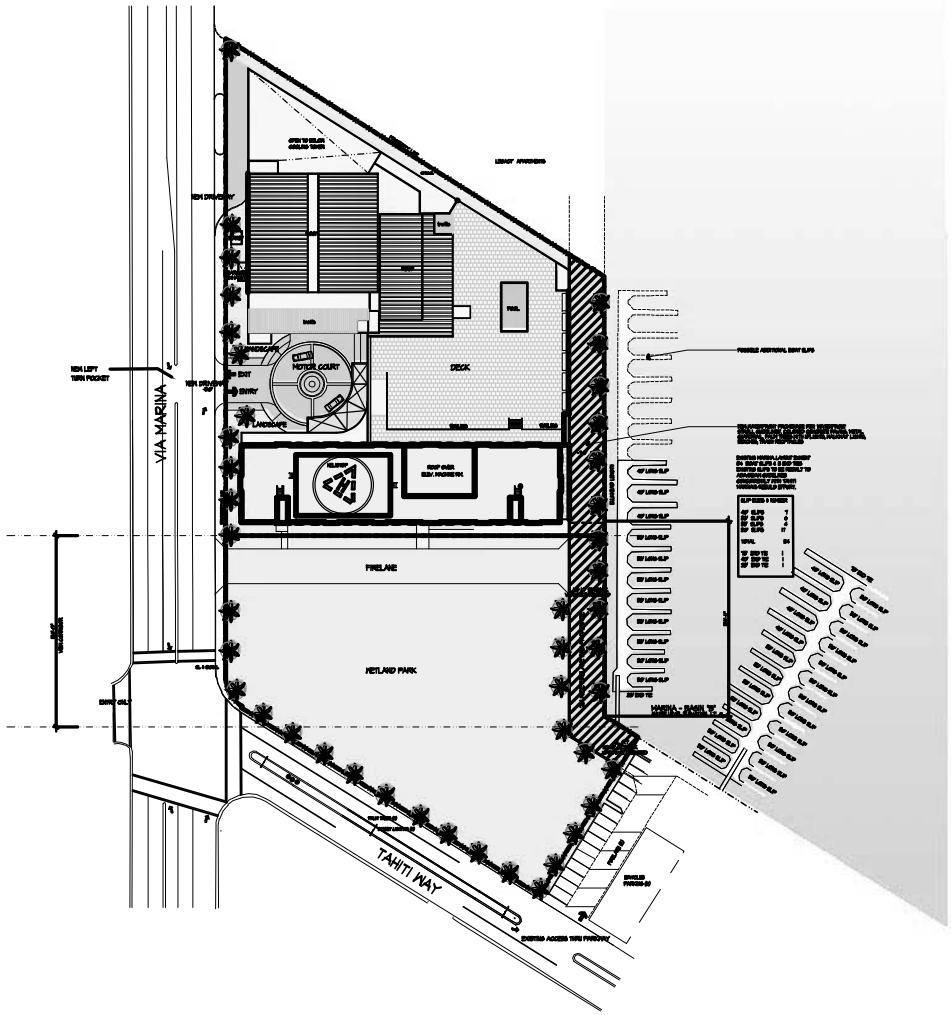
Woodfin Hotel							
UNIT TYPE COUNT	DESCRIPTION	NUMBER OF UNITS	GROSS AREA	AVERAGE DAILY FLOW (ADF)	PEAK DAILY FLOW (PDF=2.5 ADF)		
			(SF)	(GPD)	GPD	GPM	CFS
Hotel		152	N/A	22800	57000.00	39.58	0.09
1 Bedroom Apt		68	N/A	13600	34000.00	23.61	0.05
2 Bedroom Apt		68	N/A	17000	42500.00	29.51	0.07
Restaurant		180	3140	9000	22500.00	15.63	0.03
Total			3140	62400	156000.00	108.33	0.24
OCCUPANCY	AVERAGE DAILY FLOW	AVERAGE DAILY FLOW	AVERAGE DAILY FLOW				
	GALLONS / DWELLING UNIT	GALLONS / 1000 SF GROSS AREA	GALLONS / SEAT				
Hotel	150						
1 Bedroom Apt	200						
2 Bedroom Apt	250						
Restaurant			50				

Table 6.2: Proposed Sewage Flow Calculation Summary by City of Los Angeles standards

Proposed Condition

Woodfin Hotel							
UNIT TYPE COUNT	DESCRIPTION	NUMBER OF UNITS	GROSS AREA	AVERAGE DAILY FLOW (ADF)	PEAK DAILY FLOW (PDF=2.5 ADF)		
			(SF)	(GPD)	GPD	GPM	CFS
Hotel		152	N/A	19760	49400.00	34.31	0.08
1 Bedroom Apt		68	N/A	8160	20400.00	14.17	0.03
2 Bedroom Apt		68	N/A	10880	27200.00	18.89	0.04
Restaurant		180	3140	5400	13500.00	9.38	0.02
Total			3140	44200	110500.00	76.74	0.17
OCCUPANCY	AVERAGE DAILY FLOW	AVERAGE DAILY FLOW	AVERAGE DAILY FLOW				
	GALLONS / DWELLING UNIT	GALLONS / 1000 SF GROSS AREA	GALLONS / SEAT				
Hotel	130						
1 Bedroom Apt	120						
2 Bedroom Apt	160						
Restaurant			30				

EXHIBITS



0' 50' 100'

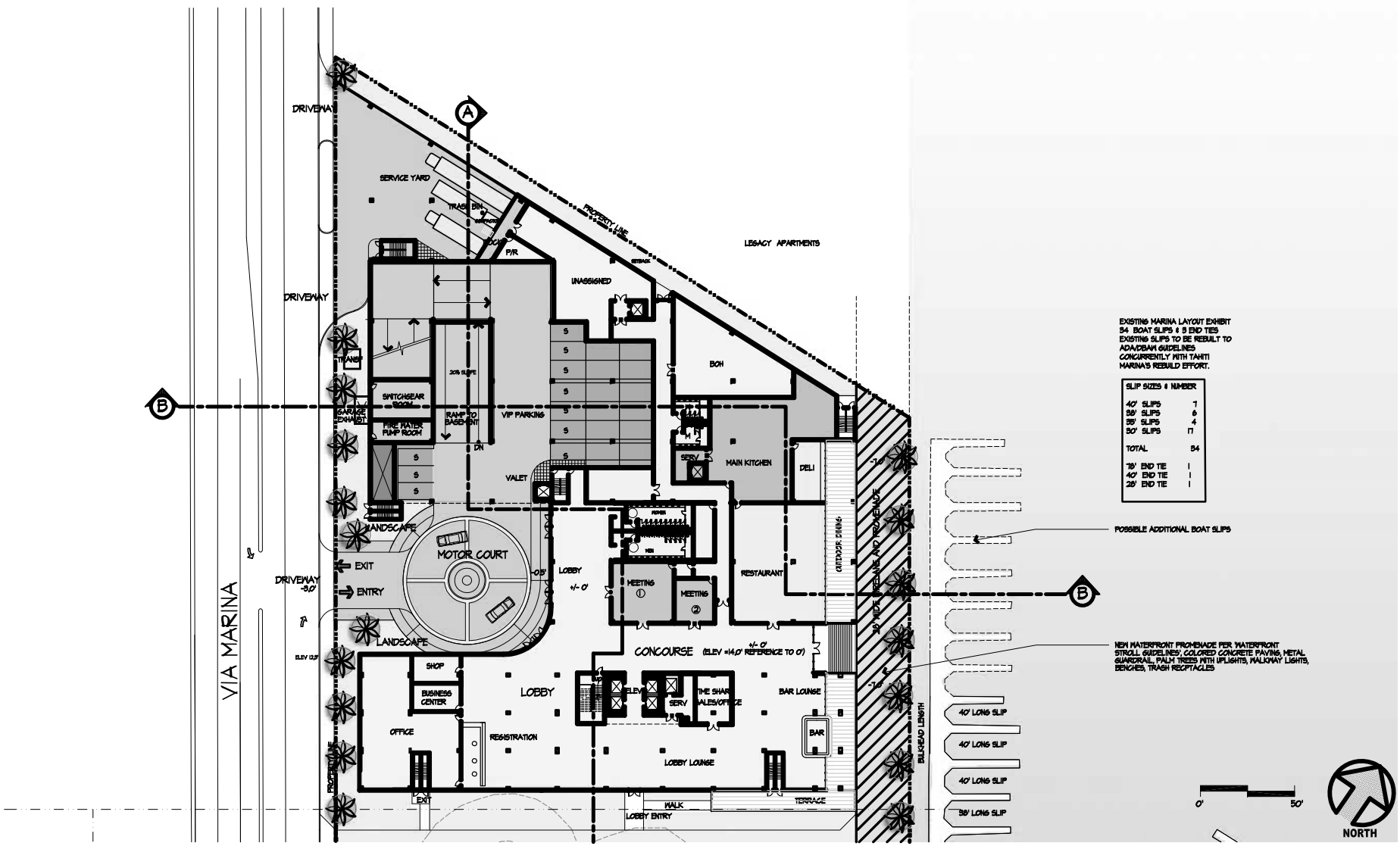
NORTH

WOODFIN SUITE HOTEL and
VACATION OWNERSHIP
MARINA DEL REY, CALIFORNIA

SITE PLAN
SCHEME "Y"
SCALE 1 : 100'

PROJECT NO. 20143.00

REVISED MAY 08, 2006



EXISTING MARINA LAYOUT EXHIBIT
34 BOAT SLIPS & 3 END TIES
EXISTING SLIPS TO BE REBUILT TO ADA/DBAM GUIDELINES CONCURRENTLY WITH TAHITI MARINA'S REBUILD EFFORT.

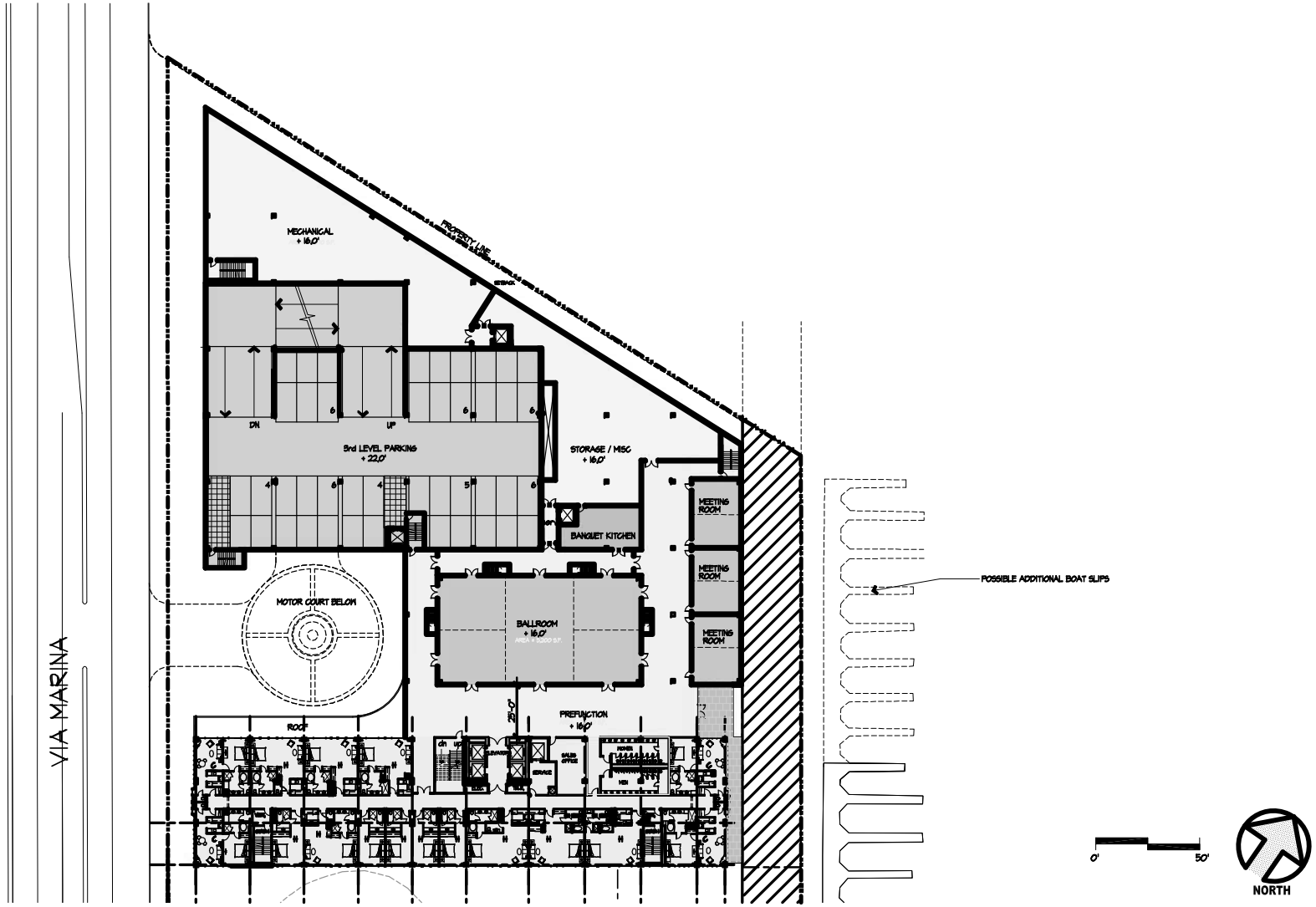
SLIP SIZES & NUMBER	
40' SLIPS	7
38' SLIPS	6
35' SLIPS	4
30' SLIPS	17
TOTAL	34
18' END TIE	1
40' END TIE	1
28' END TIE	1

WOODFIN SUITE HOTEL and
VACATION OWNERSHIP
MARINA DEL REY, CALIFORNIA

GROUND FLOOR PLAN
SCHEME "Y"
SCALE 1 : 50'

PROJECT NO. 20143.00

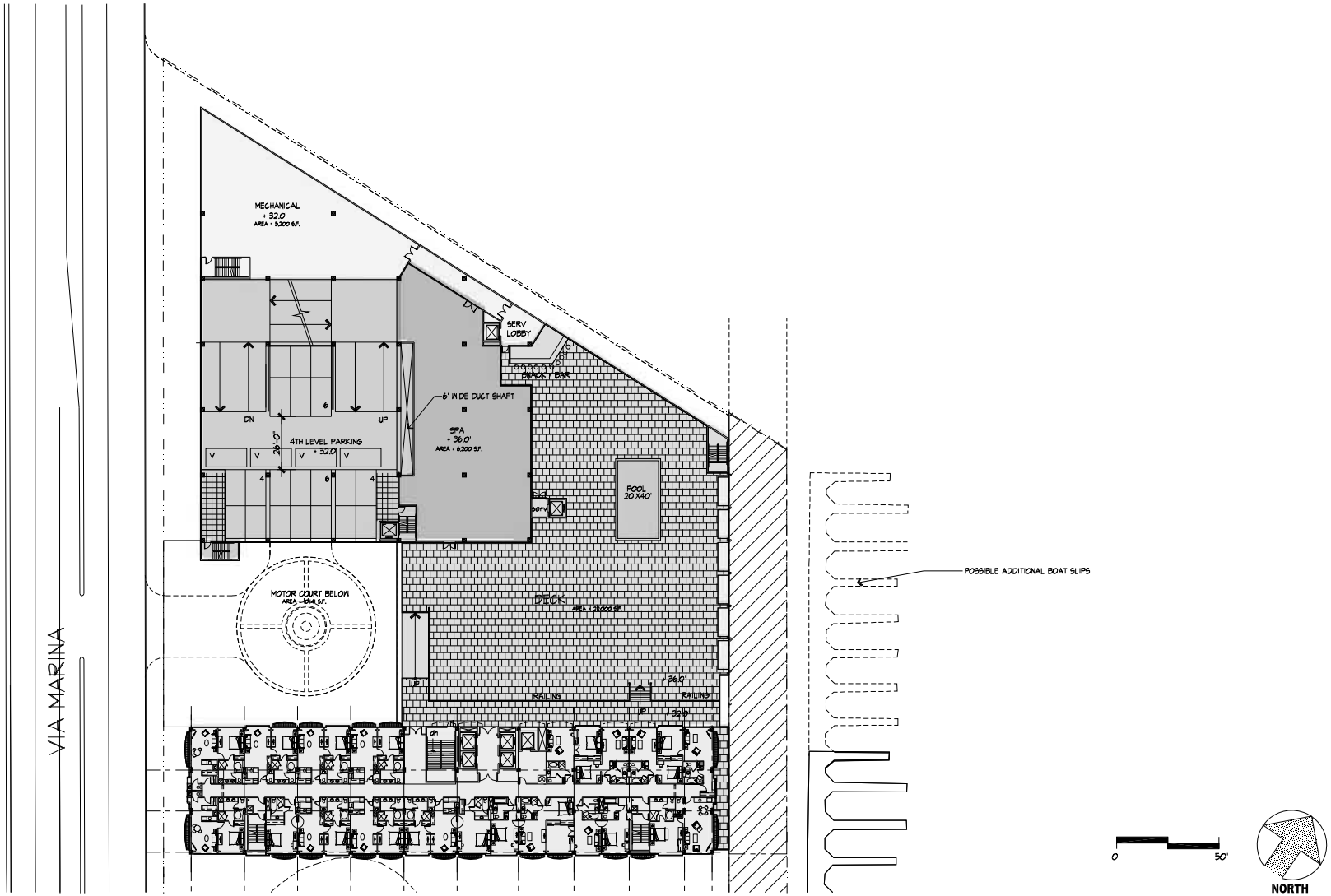
REVISED MAY 08, 2006



WOODFIN SUITE HOTEL and
VACATION OWNERSHIP
MARINA DEL REY, CALIFORNIA

2ND FLOOR PLAN
SCHEME "Y"
SCALE 1 : 50'

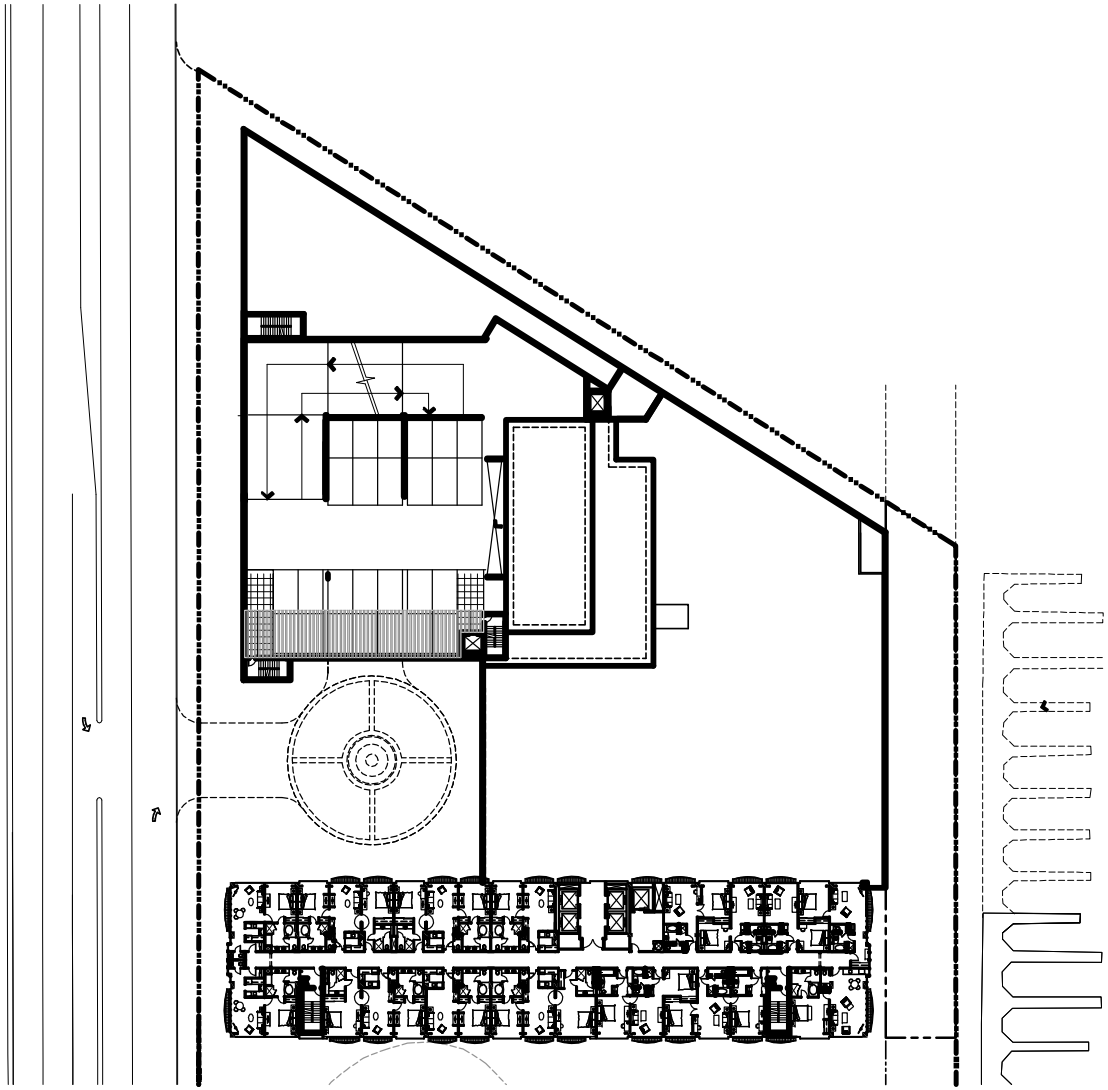
GIN WONG ASSOCIATES
PLANNING AND ARCHITECTURE
LOS ANGELES, CALIFORNIA USA
PROJECT NO. 20143.00

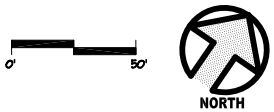


WOODFIN SUITE HOTEL and
VACATION OWNERSHIP
MARINA DEL REY, CALIFORNIA

3RD FLOOR PLAN
SCHEME "Y"
SCALE 1 : 50'

GIN WONG ASSOCIATES
PLANNING AND ARCHITECTURE
LOS ANGELES, CALIFORNIA USA
PROJECT NO. 2014.3.00

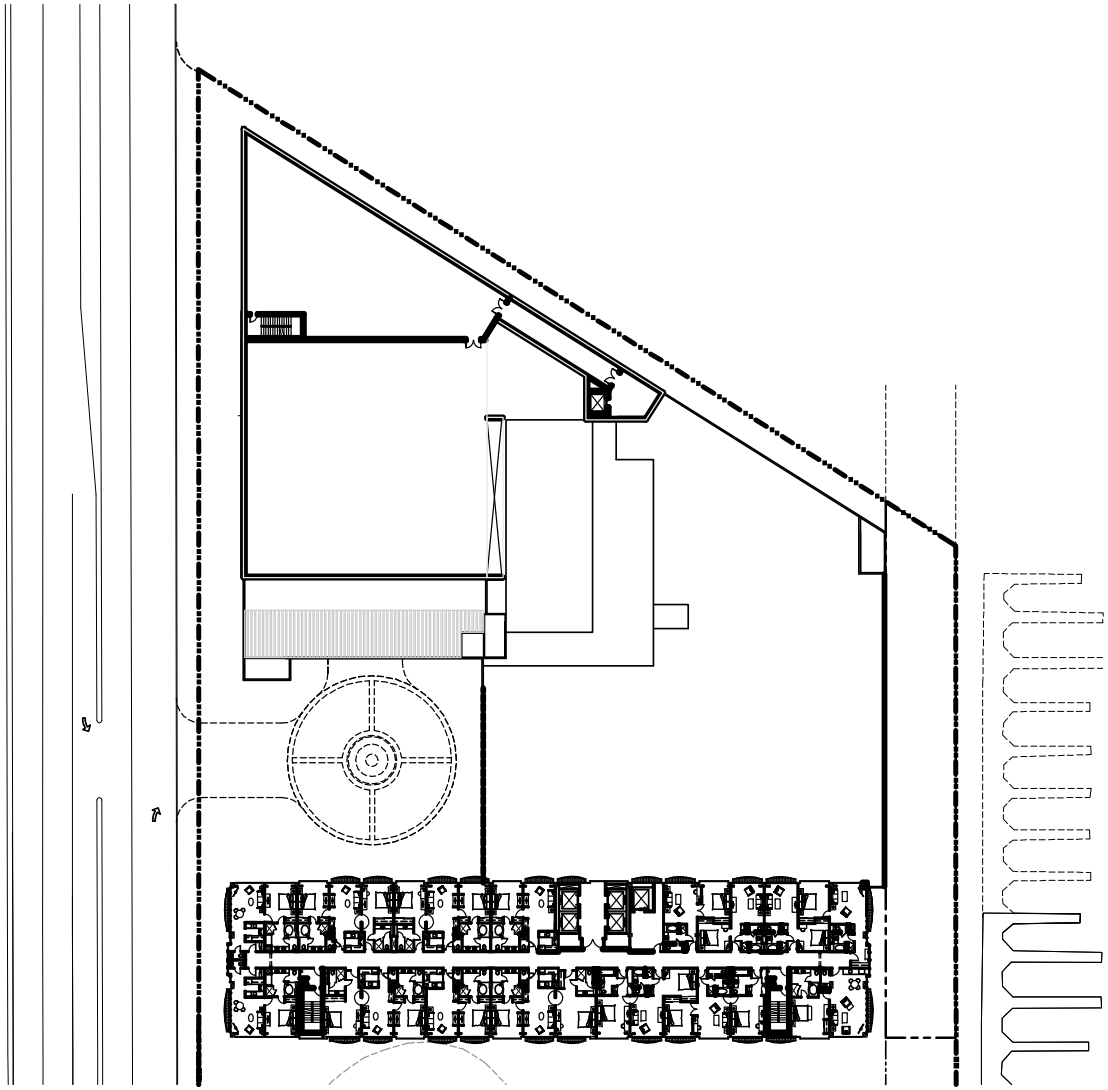




WOODFIN SUITE HOTEL and
VACATION OWNERSHIP
MARINA DEL REY, CALIFORNIA

4TH FLOOR PLAN
SCHEME "Y"
SCALE 1 : 50'

GIN WONG ASSOCIATES
PLANNING AND ARCHITECTURE
LOS ANGELES, CALIFORNIA USA
PROJECT NO. 20143.00



WOODFIN SUITE HOTEL and
VACATION OWNERSHIP
MARINA DEL REY, CALIFORNIA

5TH FLOOR PLAN
SCHEME "Y"
SCALE 1 : 50'

GIN WONG ASSOCIATES
PLANNING AND ARCHITECTURE
LOS ANGELES, CALIFORNIA USA
PROJECT NO. 20143.00

APPENDICES

Estimated Average Daily Sewage Flows for Various Occupancies

Occupancy	Abbreviation	*Average daily flow	
Apartment Buildings:			
Bachelor or Single dwelling units	Apt	100	gal/D.U. → 150
1 bedroom dwelling units	Apt	150	gal/D.U. → 200
2 bedroom dwelling units	Apt	200	gal/D.U. → 250
3 bedroom or more dwelling units	Apt	250	gal/D.U. → use 300 GPD per SMD
Auditoriums, churches, etc.	Aud	5	gal/seat
Automobile parking	P	25	gal/1000 sq ft gross floor area
Bars, cocktails lounges, etc.	Bar	20	gal/seat
Commercial Shops & Stores	CS	100	gal/1000 sq ft gross floor area
Hospitals (surgical)	HS	500	gal/bed
Hospitals (convalescent)	HC	85	gal/bed
Hotels	H	150	gal/room
Medical Buildings	MB	300	gal/1000 sq ft gross floor area
Motels	M	150	gal/unit
Office Buildings	Off	200	gal/1000 sq ft gross floor area
Restaurants, cafeterias, etc.	R	50	gal/seat
Schools:			
Elementary or Jr. High	S	10	gal/student
High Schools	HS	15	gal/student
Universities or Colleges	U	20	gal/student
College Dormitories	CD	85	gal/student

*Multiply the average daily flow by 2.5 to obtain the peak flow

Zoning Coefficients

Zone	Coefficient (cfs/Acre)
Agriculture	**0.001**
Residential+:	
R-1	**0.004**
R-2	**0.008**
R-3	**0.012**
R-4	**0.016***
Commercial:	
C-1 through C-4	**0.015***
Heavy Industrial:	
M1 through M-4	**0.021***

***Individual building, commercial or industrial plant capacities shall be the determining factor when they exceed the coefficients shown**

+ Use 0.001 (cfs/unit) for condominiums only

SEWERAGE FACILITIES CHARGE
SEWAGE GENERATION FACTORS FOR
RESIDENTIAL AND COMMERCIAL CATEGORIES

EFFECTIVE DATE: June 6, 1996

FACILITY DESCRIPTION	PROPOSED SGF IN GPD	BOD (mg/l)	SS (mg/l)
ACUPUNCTURE OFFICE/CLINIC	150/1000 GR.SQ.FT.	130	80
ARCADE - VIDEO GAMES	80/1000 GR.SQ.FT.	150	150
AUDITORIUM	4/SEAT	150	150
AUTO PARKING	20/1000 GR.SQ.FT.	150	150
AUTO BODY/MECH. REPAIR SHOP [7]	80/1000 GR.SQ.FT. (DOMESTIC) Avg. Process Flow (INDUSTRIAL)	180	280
BAKERY	280/1000 GR.SQ.FT.	1000	600
BANK: HEADQUARTERS	150/1000 GR.SQ.FT.	130	80
BANK: BRANCH	80/1000 GR.SQ.FT.	150	150
BANQUET ROOM/BALLROOM	800/1000 GR.SQ.FT.	1000	600
BAR: COCKTAIL, FIXED SEAT [4]	18/SEAT	200	200
BAR: JUICE, NO BAKING FACILITIES[15]	120/1000 GR.SQ.FT.	200	200
BAR: JUICE, WITH BAKING FACILITIES[15]	280/1000 GR.SQ.FT.	1000	600
BAR: COCKTAIL, PUBLIC TABLE AREA [4]	500/1000 GR.SQ.FT.	1000	600
BARBER SHOP	100/1000 GR.SQ.FT.	150	150
BEAUTY PARLOR	280/1000 GR.SQ.FT.	150	150
BLDG. CONST/FIELD OFFICE [3]	150/OFFICE	150	150
BOWLING ALLEY: ALLEY, LANES & LOBBY AREA	80/1000 GR.SQ.FT.	150	150
BOWLING FACILITY: ARCADE/BAR/RESTAURANT/DANCING	SFC = Sum of SFC's for all areas, based on individual SGF's		
CAFETERIA: FIXED SEAT	30/SEAT	1000	600
CAR WASH: AUTOMATIC [7]	Avg. Process Flow	20	150
CAR WASH: COIN OPERATED BAYS [7]	Avg. Process Flow	20	150
CAR WASH: HAND WASH [7]	Avg. Process Flow	20	150
CAR WASH: COUNTER & SALE AREA	80/1000 GR.SQ.FT.	20	150
CHAPEL: FIXED SEAT	4/SEAT	150	150

CHIROPRACTIC OFFICE	150/1000 GR.SQ.FT.	130	80
CHURCH: FIXED SEAT	4/SEAT	150	150
CHURCH SCHOOL: DAY CARE/ELEM	8/OCCUPANT	130	100
CHURCH SCHOOL: ONE DAY USE	200/1000 GR.SQ.FT.	130	100
COCKTAIL LOUNGE: FIXED SEAT [16]	18/SEAT	200	200
COFFEE HOUSE: NO PASTRY BAKING & NO FOOD PREPARATION [15]	120/1000 GR.SQ.FT.	200	200
COFFEE HOUSE: PASTRY BAKING ONLY [15]	280/1000 GR.SQ.FT.	1000	600
COFFEE HOUSE: SERVES PREPARED FOOD [15]	30/SEAT	1000	600
COLD STORAGE: NO SALES [2]	20/1000 GR.SQ.FT.	150	150
COLD STORAGE: RETAIL SALES [2]	80/1000 GR.SQ.FT.	150	150
COMFORT STATION: PUBLIC	100/FIXTURE	150	150
COMMERCIAL USE	80/1000 GR.SQ.FT.	150	150
COMMUNITY CENTER	4/OCCUPANT	150	150
CONFERENCE ROOM OF OFFICE BLDG.	Same as other areas in an office bldg.	130	80
COUNSELING CENTER [5]	150/1000 GR.SQ.FT.	130	80
CREDIT UNION	150/1000 GR.SQ.FT.	150	150
DAIRY [7]	Avg. Process Flow	2,369	922
DAIRY: BARN [7]	Avg. Process Flow	2,213	1,453
DAIRY: RETAIL AREA	80/1000 GR.SQ.FT.	150	150
DANCING AREA [4] (OF BARS OR NIGHTCLUB)	600/1000 GR.SQ.FT.	200	200
DANCE STUDIO [9]	80/1000 GR.SQ.FT.	150	150
DENTAL OFFICE/CLINIC	250/1000 GR.SQ.FT.	130	80
DOUGHNUT SHOP	280/1000 GR.SQ.FT.	1000	600
DRUG REHABILITATION CENTER [5]	150/1000 GR.SQ.FT.	130	80
EQUIPMENT BOOTH	20/1000 GR.SQ.FT.	150	150
FILM PROCESSING - 1 HOUR PHOTO, etc.	100/1000 GR.SQ.FT.	150	150
FILM PROCESSING - INDUSTRIAL	80/1000 GR.SQ.FT. (DOMESTIC) Avg. Process Flow (INDUSTRIAL)	150 160	150 60
FOOD PROCESSING PLANT [7]	80/1000 GR.SQ.FT. (DOMESTIC) Avg. Process Flow (INDUSTRIAL)	150 2,213	150 1,453
GAS STATION: SELF SERVICE	100/W.C.	180	280

GAS STATION: FOUR BAYS MAX	430/STATION	180	280
GOLF COURSE: 18-HOLE/9-HOLE GREEN AREA	0	150	150
GOLF COURSE: DRIVING RANGE	0	150	150
GOLF COURSE FACILITY: LOBBY/OFFICE/RESTAURANT/BAR	SFC = Sum of SFC's for all areas, based on individual SGF's		
GYMNASIUM - BASKETBALL, VOLLEYBALL [10]	250/1000 GR.SQ.FT.	150	150
HANGER (AIRCRAFT)	80/1000 GR.SQ.FT.	180	280
HEALTH CLUB/SPA [10]	800/1000 GR.SQ.FT.	150	150
HOMELESS SHELTER	75/BED	215	205
HOSPITAL	75/BED	250	100
HOSPITAL: CONVALESCENT	75/BED	250	100
HOSPITAL: ANIMAL	280/1000 GR.SQ.FT.	150	150
HOSPITAL: PSYCHIATRIC	75/BED	215	205
HOSPITAL: SURGICAL	450/BED	250	100
HOTEL: USE GUEST ROOMS ONLY	130/ROOM	310	120
JAIL	85/INMATE	310	120
KENNEL: DOG KENNEL/OPEN	100/1000 GR.SQ.FT.	150	150
LABORATORY: COMMERCIAL	250/1000 GR.SQ.FT.	339	151
LABORATORY: INDUSTRIAL [7]	Avg. Process Flow	339	151
LAUNDROMAT	170/MACHINE	150	110
LIBRARY: PUBLIC AREA	80/1000 GR.SQ.FT.	150	150
LIBRARY: STACKS, STORAGE	25/1000 GR.SQ.FT.	150	150
LOBBY OF RETAIL AREA [1]	80/1000 GR.SQ.FT.	150	150
LODGE HALL	4/SEAT	150	150
LOUNGE [1]	80/1000 GR.SQ.FT.	200	200
MACHINE SHOP [7]	80/1000 GR.SQ.FT. (DOMESTIC) Avg. Process Flow (INDUSTRIAL)	150 290	150 550
MANUFACTURING OR INDUSTRIAL FACILITY [7]	80/1000 GR.SQ.FT. (DOMESTIC) Avg. Process Flow (INDUSTRIAL)	150	150
MASSAGE PARLOR	275/1000 GR.SQ.FT.	150	150
MEDICAL BUILDING	250/1000 GR.SQ.FT.	130	80
MEDICAL: LAB IN HOSPITAL	250/1000 GR.SQ.FT.	331	151
MEDICAL OFFICE/CLINIC	250/1000 GR.SQ.FT	130	80

MINI-MALL	80/1000 GR.SQ.FT.	600	400
MORTUARY: EMBALMING	5/7 GR. SQ. FT.	800	800
MORTUARY: CHAPEL	4/SEAT	150	150
MORTUARY: LIVING AREA	80/1000 GR.SQ.FT.	215	205
MORTUARY:CHAPEL/LIVING AREA/EMBALMING	SFC=Sum of SFC's for all areas, based on individual SGF's		
MOTEL: USE GUEST ROOMS ONLY	130/ROOM	310	120
MUSEUM: ALL AREA	20/1000 GR.SQ.FT.	150	150
MUSEUM: OFFICE OVER 15%	150/1000 GR.SQ.FT	150	150
MUSEUM: SALES AREA	80/1000 GR.SQ.FT.	150	150
OFFICE BUILDING	150/1000 GR.SQ.FT.	130	80
OFFICE BLDG W/ COOLING TOWER	180/1000 GR.SQ.FT.	108	67
PLATING PLANT [7]	80/1000 GR.SQ.FT. (DOMESTIC) Avg. Process Flow (INDUSTRIAL)	150	150
POOL HALL (NO ALCOHOL)	80/1000 GR.SQ.FT.	150	150
POST OFFICE: FULL SERVICE [14]	150/1000 GR.SQ.FT.	150	150
POST OFFICE: PRIVATE MAIL BOX RENTAL	80/1000 GR.SQ.FT.	150	150
PRISONS	175/INMATE	310	120
RESIDENTIAL DORM: COLLEGE OR RESIDENTIAL [12]	75/STUDENT	215	205
RESIDENTIAL: BOARDING HOUSE	75/BED	215	205
RESIDENTIAL: APT - BACHELOR	80/DU	215	205
RESIDENTIAL: APT - 1 BDR [6]	120/DU	215	205
RESIDENTIAL: APT - 2 BDR [6]	160/DU	215	205
RESIDENTIAL: APT - 3 BDR [6]	200/DU	215	205
RESIDENTIAL: APT - >3 BDR [6]	40 PER ADDITIONAL BEDROOM	215	205
RESIDENTIAL: CONDO - 1 BDR [6]	120/DU	215	205
RESIDENTIAL: CONDO - 2 BDR [6]	160/DU	215	205
RESIDENTIAL: CONDO - 3 BDR [6]	200/DU	215	205
RESIDENTIAL: CONDO - >3 BDR [6]	40 PER ADDITIONAL BEDROOM	215	205
RESIDENTIAL: DUPLEX/TOWNHOUSE/SFD - 1 BDR [6]	130/DU	215	205
RESIDENTIAL: DUPLEX/TOWNHOUSE/SFD - 2 BDR [6]	180/DU	215	205

RESIDENTIAL: DUPLEX/TOWNHOUSE/SFD - 3 BDR [6]	230/DU	215	205
RESIDENTIAL: DUPLEX/TOWNHOUSE/SFD - >3 BDR [6]	50 PER ADDITIONAL BDR	215	205
RESIDENTIAL ROOM ADDITION: BEDROOM [6]	50/BDR	215	205
RESIDENTIAL ROOM ADDITION: OTHER THAN BEDROOM [6]	0	0	0
RESIDENTIAL ROOM CONVERSION: INTO A BEDROOM [6]	50/BDR	215	205
RESIDENTIAL ROOM CONVERSION: INTO A ROOM OTHER THAN BEDROOM [6]	0	0	0
RESIDENTIAL: MOBILE HOME	160/DU	215	205
RESIDENTIAL: ARTIST (2/3 AREA)	250/DU	215	205
RESIDENTIAL: ARTIST RESIDENCE	80/DU	215	205
RESIDENTIAL: GUEST HOME W/ KITCHEN	Same as Residential Apartment	215	205
RESIDENTIAL: GUEST HOME W/O KITCHEN	50 PER BDR	150	150
REST HOME	75/BED	250	100
RESTAURANT: DRIVE-IN	40/STALL	1000	600
RESTAURANT: DRIVE-IN	20/SEAT	1000	600
RESTAURANT: FAST FOOD INDOOR SEAT	20/SEAT	1000	600
RESTAURANT: FAST FOOD OUTDOOR SEAT	12/SEAT	1000	600
RESTAURANT: FULL SERVICE INDOOR SEAT	30/SEAT	1000	600
RESTAURANT: FULL SERVICE OUTDOOR SEAT	18/SEAT	1000	600
RESTAURANT: TAKE-OUT	300/1000 GR.SQ.FT.	1000	600
RETAIL AREA	80/1000 GR.SQ.FT.	150	150
RIFLE RANGE: SHOOTING STALLS, SHOOTING LANES, LOBBY AREA	80/1000 GR.SQ.FT.	150	150
RIFLE RANGE FACILITY: BAR/RESTAURANT	SFC = Sum of SFC's for all areas, based on individual SGF's		
SCHOOL: ARTS/DANCING/MUSIC [9]	80/1000 GR.SQ.FT.	130	100
SCHOOL: DAY CARE CENTER [8]	8/CHILD	130	100
SCHOOL: ELEMENTARY/JR. HIGH [8]	8/STUDENT	130	100

SCHOOL: HIGH SCHOOL [8]	12/STUDENT	130	100
SCHOOL: KINDERGARTEN	200/1000 GR.SQ.FT.	130	100
SCHOOL: MARTIAL ARTS [9]	80/1000 GR.SQ.FT.	130	100
SCHOOL: NURSERY-DAY CARE [8]	8/CHILD	130	100
SCHOOL: SPECIAL CLASS [8]	8/STUDENT	130	100
SCHOOL: TRADE OR VOCATIONAL [8]	12/STUDENT	130	100
SCHOOL: TRAINING [8]	12/STUDENT	130	100
SCHOOL: UNIVERSITY/COLLEGE [8]	18/STUDENT	130	100
SCHOOL: DORMITORY [12]	75/STUDENT	215	205
SCHOOL: STADIUM, PAVILION	4/SEAT	150	150
SPA/JACUZZI (Commercial, with backwash filters) [7]	Avg. Backwash Flow	150	150
SPA/JACUZZI (Residential, with replaceable filter cartridges)	0		
STORAGE: BUILDING/WAREHOUSE	20/1000 GR.SQ.FT.	150	150
STORAGE: SELF STORAGE BLDG.	20/1000 GR.SQ.FT.	150	150
STORE: ICE CREAM/YOGURT	80/1000 GR.SQ.FT.	1000	600
STORE: RETAIL [1]	80/1000 GR.SQ.FT.	150	150
STUDIO: FILM / TV - AUDIENCE VIEWING ROOM [13]	4/SEAT	150	150
STUDIO: FILM / TV - REGULAR USE [13] INDOOR FILMING AREA	80/1000 GR.SQ.FT.	150	150
STUDIO: FILM / TV - INDUSTRIAL USE [13] FILM PROCESS./MACHINE SHOP [7]	80/1000 GR.SQ.FT. (DOMESTIC) Avg. Process Flow (INDUSTRIAL)	150	150
STUDIO: RECORDING	80/1000 GR.SQ.FT.	150	150
SWIMMING POOL (Commercial, with backwash filters)	Avg. Backwash Flow		
SWIMMING POOL (Residential, with replaceable filter cartridges)	0	0	0
TANNING SALON: INDEPENDENT, NO SHOWER [11]	80/1000 GR.SQ.FT.	150	150
TANNING SALON: WITHIN A HEALTH SPA/CLUB	800/1000 GR.SQ.FT.	150	150
THEATER: DRIVE-IN	10/VEHICLE	150	150
THEATER: LIVE/MUSIC/OPERA	4/SEAT	150	150
THEATER: CINEMA	4/SEAT	150	150

TRACT: COMMERCIAL/RESIDENTIAL	1/ACRE	215	205
TRAILER - CONST/FIELD OFFICE [3]	150/OFFICE	150	150
VETERINARY CLINIC/OFFICE	280/1000 GR.SQ.FT.	130	80
WAREHOUSE	20/1000 GR.SQ.FT.	150	150
WAREHOUSE W/ OFFICE	CHARGE EACH FACILITY SEPARATELY		
WASTE DUMP: RECREATIONAL	430/STATION	150	150
WINE TASTING ROOM: KITCHEN	215/1000 GR.SQ.FT.	150	150
WINE TASTING ROOM: ALL AREA	80/1000 GR.SQ.FT.	150	150

FOOTNOTES

[1] Lobby of retail includes lounges, holding rooms, or waiting area, etc.

[2] Cold storage facilities are categorized as follow:

A. No Sales - the cold storage facility is used only for temporary storage, no selling is involved. For example, cold storage facilities at the harbor temporarily store seafood until it is distributed.

B. Cold storage w/ retail sales - the primary function of this facility is to support the wholesale/retail operation of a store, such as supermarket freezers, refrigerators, etc.

[3] Building construction includes trailers, field offices, etc.

[4] The SFC for a bar shall be the sum of SFC's for all areas based on the SGF for each area (ex. fixed seat area, public table area, dancing area).

[5] Counseling centers include marriage counseling centers, alcohol/drug rehabilitation /dependency centers, nutrition centers, diet centers, etc.

[6] A bedroom is defined as an enclosed subdivision with 50 sq.ft. or more floor area in a residential building commonly used for sleeping purpose, and is partitioned off to form a habitable room.

[7] Bureau of Sanitation will determine the flow base on the information given by applicants for facilities with industrial discharge. The flow will be redetermined by Sanitation inspectors annually base on water bills. If the actual flow exceeds the previous year determined flow, the applicants will be charged for the difference.

Please refer to the Sewerage Facilities Charge for industrial customers.

If this type of facility is exempt from an industrial discharge permit, only the domestic SFC will be assessed.

[8] The SGF for schools based on the student capacity, covers the following facilities:

A. classrooms and lecture halls
B. professors' offices
C. administration offices
D. laboratories for classes or research
E. libraries
F. bookstores
G. student/professor lounges
H. school cafeterias

I. warehouses and storage areas
J. auditoriums
K. gymnasiums

When a school files an application for addition of any of the foregoing facilities, the student population will be reassessed and the total gpd for the new facility will be based on the number of students increased since the last SFC was paid or when the City implemented the SFC for the first time. The SFC for any school facility (ex. stadium, dormitory, etc.) not listed above, will be based on the designated SGF for that category.

9 Part-time basis schools or dance studios should be charged as retail area - 80 gpd /1000 gr.sq.ft. Full-time basis schools should be charged by the number of students.

10 Bureau of Sanitation will determine if an industrial permit is needed for health spas. The first year flow is based on 800 gpd/1000 gr.sq.ft., and the Sanitation inspectors will redetermine the flow annually base on water bill from the previous year. The applicants are responsible for paying the difference of SFC.

Health club/spa includes lobby area, workout floors, aerobic rooms, swimming pools, Jacuzzi, sauna, locker rooms, showers, and restrooms. If a health club/spa has a gymnasium type of facility, this portion should be charged separately at the gymnasium SFC rate.

Gymnasiums include basketball court, volleyball court, and any other large open space with low occupancy density.

11 No independent tanning salons with shower was encountered during survey.

12 The SGF for a college dormitory based on student capacity also includes the SGF for the dormitory cafeterias.

13 The SFC for a TV or motion picture studio shall be the sum of SFC's for different facilities in the studio, based on the SGF for each facility. A studio may include one or more of the following facilities: audience viewing room, filming room, film processing, storage area, etc.

14 Full service post offices include U.S. Postal Service, UPS, Federal Express, DHL, and etc.

15 The determination of SGF for juice bars and coffee houses depends on the extent of the actual food preparation in house, <u>not</u> by the types of food provided.

1) SGF for <u>no</u> pastry baking and <u>no</u> food preparation is 120 gpd/1000 gr.sq.ft.
2) SGF for pastry baking <u>only</u> and <u>no</u> food preparation is 280 gpd/1000 gr.sq.ft.
3) SGF for complete food preparation is 30 gpd/seat.

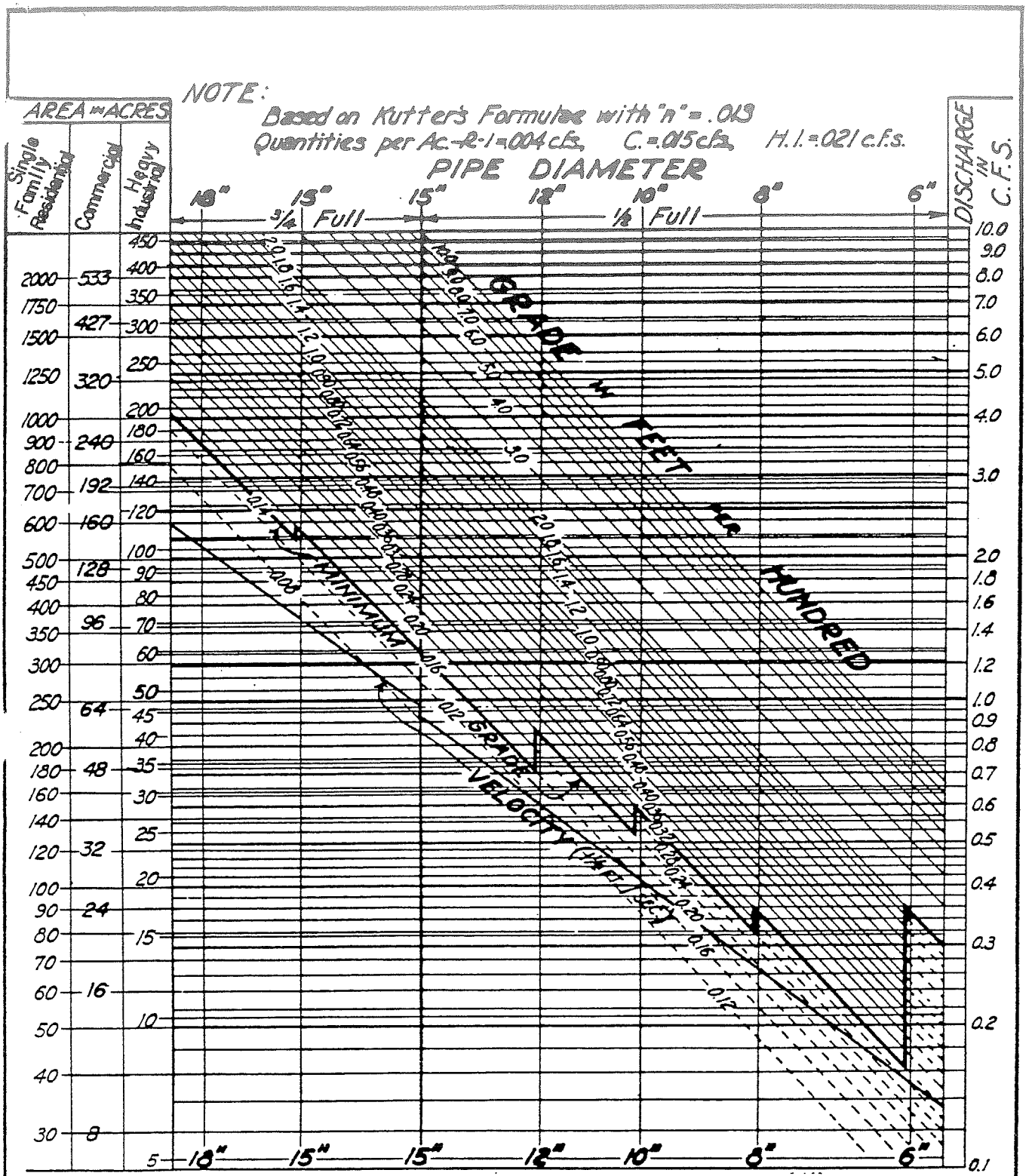
For example, a juice bar that offers doughnuts or pastries purchased from food wholesale dealers,

should be considered as a facility with no pastry baking.

Juice bars and coffee houses do not serve any alcoholic drinks.

16 Cocktail lounge usually does not serve prepared food.

SGFRE&CO.WPD
Revised 06/25/96
Disk no.3D



NOTE: USE 15"-1/2 FULL FOR COMPUTING DESIGN CAPACITY OF A NEW SEWER SYSTEM. USE 15"-3/4" FULL FOR CHECKING CAPACITY OF EXIST. SEWER SYSTEM.

FLOW DIAGRAM FOR THE DESIGN OF CIRCULAR SANITARY SEWERS

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

ASSISTANT DEPUTY

COUNTY ENGINEER

COUNTY ENGINEER STANDARD S-C4

DATE: 3/80

DESIGN RCE 10443

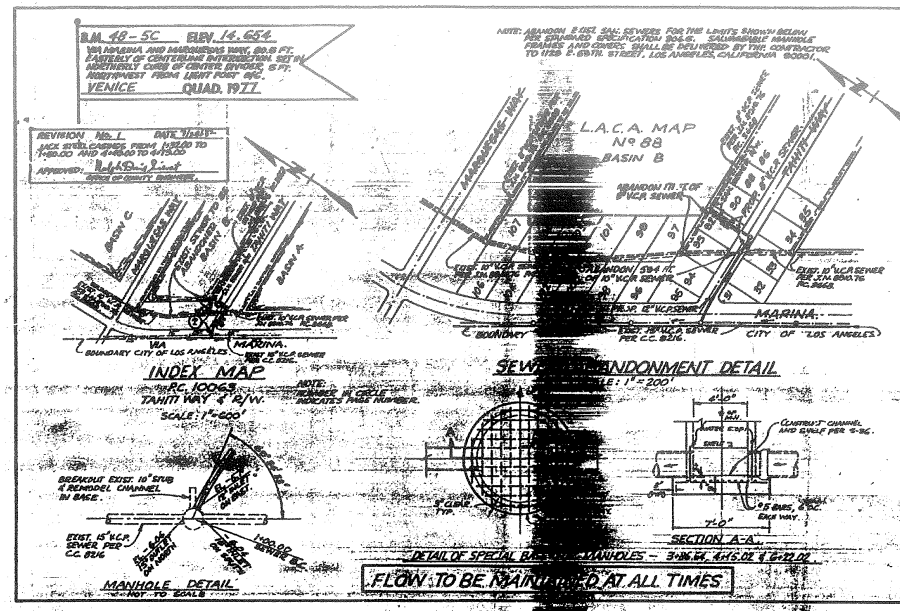
B.M. 48-5C ELEV. 14.654

VIA MARINA AND MARINAMEDA WAY, 80.0 FT. EASTERLY OF CENTERLINE INTERSECTION, SET IN NORTHERLY CURB OF CENTER BYPASS, 57 FT. NORTHWEST FROM LIGHT POST 642.

VENICE QUAD. 1977

REVISION NO. 1 DATE 7/14/82
JACK STEEL CHANGES FROM 1+50.00 TO 1+80.00 AND 4+40.00 TO 4+75.00
APPROVED: Ralph D. Mirelli
CHIEF COUNTY ENGINEER

NOTE: ABANDON 2 EXIST. SAN. SEWERS FOR THE LIMITS SHOWN BELOW. THE STANDARD SPECIFICATION SCALE, SALVAGEABLE MANHOLE FRAMES AND COVERS, SHALL BE DELIVERED BY THE CONTRACTOR TO 1128 S. GRAND STREET, LOS ANGELES, CALIFORNIA 90001.



GENERAL NOTES:

1. DIMENSIONS ARE IN FEET UNLESS N.A.C. & O.A. SIX DIVE DIGITS OF TRUE.
2. NO DEVIATION SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
3. THE REPRESENTATIVE OF THE COUNTY ENGINEER HAS RIGHT OF LAY OUT AND PORTION OF THE WORK.
4. CHANGES TO VARIOUS THE REQUIREMENTS AS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURB, CENTER LINE OF SEWERS, OR OTHER LINE OF ASSIST ARE SHOWN BY CROSSES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE DETERMINED BY AS TO CONFORM TO A STRAIGHT LINE BETWEEN BEFORE AND DESIGNATED POINTS.
5. THE PERFECT ENGINEER SHALL PROVIDE THE COUNTY ENGINEER WITH GRADE SHEETS AND REFERENCES FOR ALL AND ALL LATERALS AND "T" OR "Y" CONNECTIONS AND AS ALL POINTS SHOWN FOR THOSE AT THOSE POINTS INCLUDING THOSE DESIGNATED PLANNED AHEAD. ALL SEWER LATERALS SHALL BE CONNECTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE WITH SEWER AS SHOWN ON THE PLANS. SEWER LATERALS FROM CONTROLS SHALL NOT GIVE AN ANGLE OF MORE THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE DETERMINED BY INSPECTION OF THE PERFECT ENGINEER.
6. THE PERFECT ENGINEER SHALL PROVIDE THE ABOVE LATERAL DATA AS THE PROPERTY THAT SHOW THE TOP OF CUR REFERENCE FOR EACH SEWER LATERAL ON THE GRADE SHEET.
7. BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L.A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 2 AND PAY A FEE TO THE COUNTY ENGINEER, 1128 S. GRAND AVE., LOS ANGELES, CALIFORNIA, 90015, TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.
8. AT WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 1120 SOUTH GRAND STREET, LOS ANGELES, CALIFORNIA.
9. APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE DESIGNATION OF THE PROPERTY ON NON-ALIGNMENT OF ANY ENCROACHMENT RIGHT FOR, OR OBSTACLES WITHIN THE BOUND OF THIS PROJECT, THIS NOTE APPLIES TO ALL PARTIES.
10. REFER TO SECTION 7-10.1.3 OF THE SEWER AND STORM DRAINAGE SAFETY CHECKS.
11. PRIOR TO THE ENCHANCE OF THE ABOVE-NAMED SEWER CONSTRUCTION PROJECT, THE CONTRACTOR SHALL OBTAIN AND FILE WITH THE COUNTY ENGINEER COPIES OF A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE LOS ANGELES COUNTY ROAD DEPARTMENT, A PERMIT TO EXCAVATE AND TRENCHES FROM THE DIVISION OF CALIFORNIA, DIVISION OF INDUSTRIAL SAFETY AND A CERTIFICATE OF WORKER'S COMPENSATION INSURANCE WITH THE DEPARTMENT OF COUNTY ENGINEERS, 2220 S. HIGHWAY AVE., LOS ANGELES, CALIFORNIA 90023, 8:00-4:00, NAMED AS THE CERTIFICATE HOLDER TO BE NOTIFIED 30 DAYS PRIOR TO CANCELLATION OF POLICY.

CONSTRUCTION NOTES:

1. WORK SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (1970 EDITION WITH ADDENDA) DEPARTMENTS AND COUNTY ENGINEER SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWER DATED SEPT. 21, 1976 AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.
2. THE CONTRACTOR SHALL NOTIFY THE ENVIRONMENTAL DEVELOPMENT DIVISION AT (213) 735-2215 AT LEAST TWENTY-FOUR HOURS BEFORE BEGINNING ANY WORK UNDER THIS CONTRACT.
3. HOUSE LATERALS TO BE CONSTRUCTED WITH SEWERS AT PROPERTY LINE 6 FEET BELOW CURB GRADE UNLESS OTHERWISE NOTED.
4. TYPE ON THE SERVICES MAY BE USED FOR CONNECTIONS TO MAINLINE SEWERS EXCEPT AS NOTED.
5. ALL STRUCTURES SHALL BE SEWER BRICK MANHOLES PER S-2 OR PRECAST CONCRETE MANHOLES PER S-36, EXCEPT AS NOTED.
6. PROPERTY CLEANOUTS ON THE PROPERTY LINE OR PROPERTY LINES PROVIDED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
7. MANHOLE TOPS TO BE SEWERED BODIES OF WATER TO BE LEVEL WITH FINISHED GRADE.
8. VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE "S", OR "O" PER STANDARD SPECIFICATIONS SECTION 300-2.
9. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-22, CASE II, TWO FEET ON EACH SIDE FROM THE POLE OF REFERENCE.
10. IF BEFORE THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A SEWER LINE OR WITHIN THREE FEET OF A V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-22, CASE II WITHOUT CHANGE APPROVED BY THE COUNTY ENGINEER.
11. ALL SEWER SERVICE LINE PIPE TO BE VITRIFIED CLAY PIPE SHALL BE MADE WITH A SEWER SERVICE WYE, TYPE "O", PER STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SECTION 300-2.
12. REFER TO S-1 WORK FOR SEWERS PER SECTION 300-1.4 OF THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
13. SEWERS AS SHOWN WITHIN DAVED AREA TO MEET LA COUNTY ROAD DEPT. OR CALIFORNIA STATE HIGHWAY STANDARDS IN ACCORDANCE WITH PERMITS.
14. PER COMPLIANCE WITH SECTION 300-1.5.2.0 OF THE SPECIAL PROVISIONS WILL BE REQUIRED FOR BACKFILL IN STREETS. CERTIFICATION OF BACKFILL COMPACTION AND SAND REQUIREMENT IN A GRADING, MOISTURE TESTING LABORATORY SHALL BE PROVIDED BY THE CONTRACTOR PRIOR TO THE ISSUANCE OF A CERTIFICATE OF PARTIAL ACCEPTANCE.
15. SPECIAL BACKFILL IN BOREPIPE CONSTRUCTION: (A) BACKFILL TREATED AND REPLACE OTHER EARTH SO AS TO MAINTAIN THE HISTORICAL OR PROPOSED GRADES AND SLOPES SHOWN ON THE GRADING PLAN APPROVED FOR THE DEVELOPMENT BY THE ENGINEER AND SAFETY DIVISION. (B) ALL BACKFILL AND EARTH REPLACED SHALL BE COMPACTED TO A MINIMUM OF 90% OF MAXIMUM DENSITY PER ASTM STANDARD METHOD OF TEST D-698-57T AS AMENDED. ACCEPTABLE CERTIFICATION OF EACH COMPACTION SHALL BE SUBMITTED TO THE ENVIRONMENTAL DEVELOPMENT DIVISION.

PROFILE, ALIGNMENT AND GRADE OF

PAGE 1

SANITARY SEWERS

TO BE CONSTRUCTED IN

TAHITI WAY & R/W

PRIVATE CONTRACT NO. 10063

MARINA DEL REY
W.S. 23

1 SHEET, 2 PAGES

SCALE: HORZ. 1"=40' VERT. 1"=4'

MAY, 1982

DESIGNED IN THE OFFICES OF
PSOMAS & ASSOCIATES
3420 OCEAN PARK BLVD., SANTA MONICA, CA. 90405

BY: Ralph D. Mirelli
RALPH D. MIRELLI
REG. C.E. No. 29614

THE FOLLOWING LISTED STANDARD PLANS ARE TO BE THE SAME AS THE COUNTY ENGINEER SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT.

INDEX	S-0
SEWER PUBLIC SAFETY REQUIREMENTS	S-2
INDEX MANHOLE	S-3
STANDARD MANHOLE TOP	S-4
SEWER AND DRAIN PIPE	S-22
CLEANOUTS AND BACKFILLS	S-25
TYPE OF PIPE SERVICE	S-26
CONCRETE PRECAST MANHOLE	S-36
SEWER BACKFILL PLAN AND CURVE	S-40
REINFORCED PRECAST CONCRETE MANHOLES	S-50
JACKING PIPE	S-51

COUNTY OF LOS ANGELES, CALIFORNIA

STEPHEN J. RODMICE COUNTY ENGINEER

VICTOR A. DORIANI, P.E.
DEPUTY CHIEF, PLANNING DIVISION

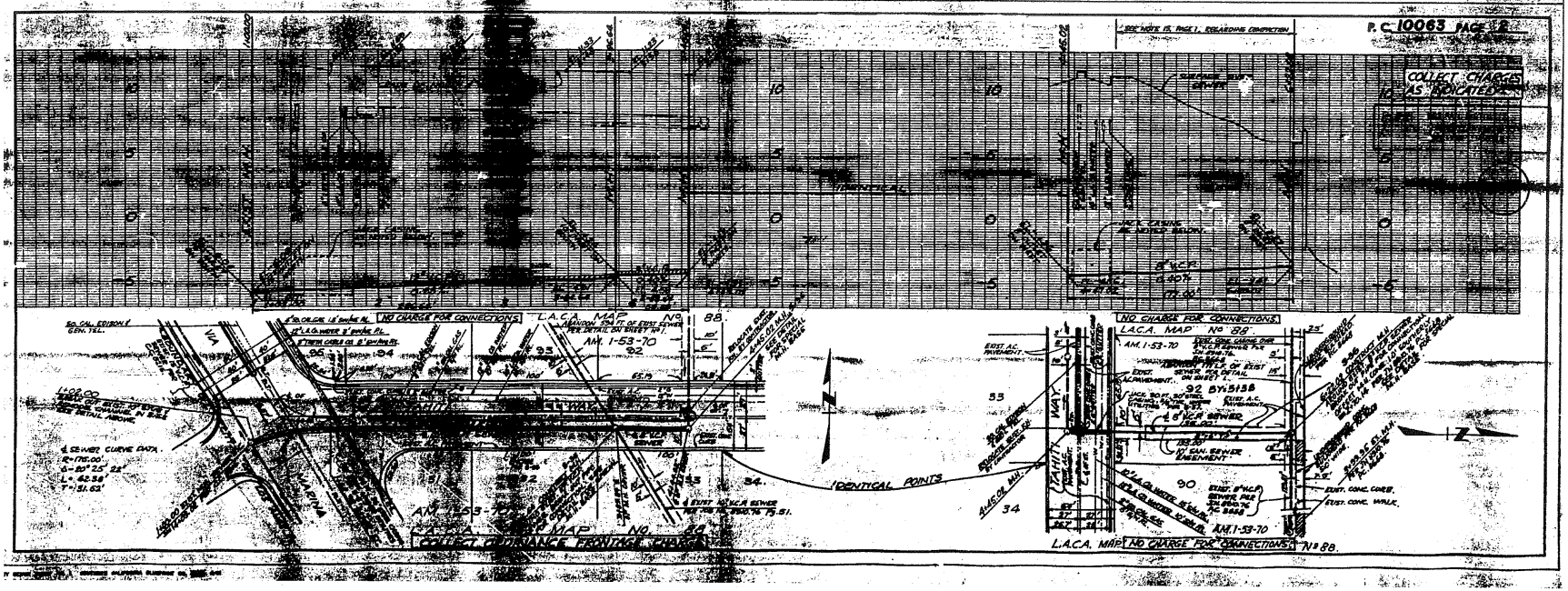
APPROVED: Victor A. Doriani 7/16/82

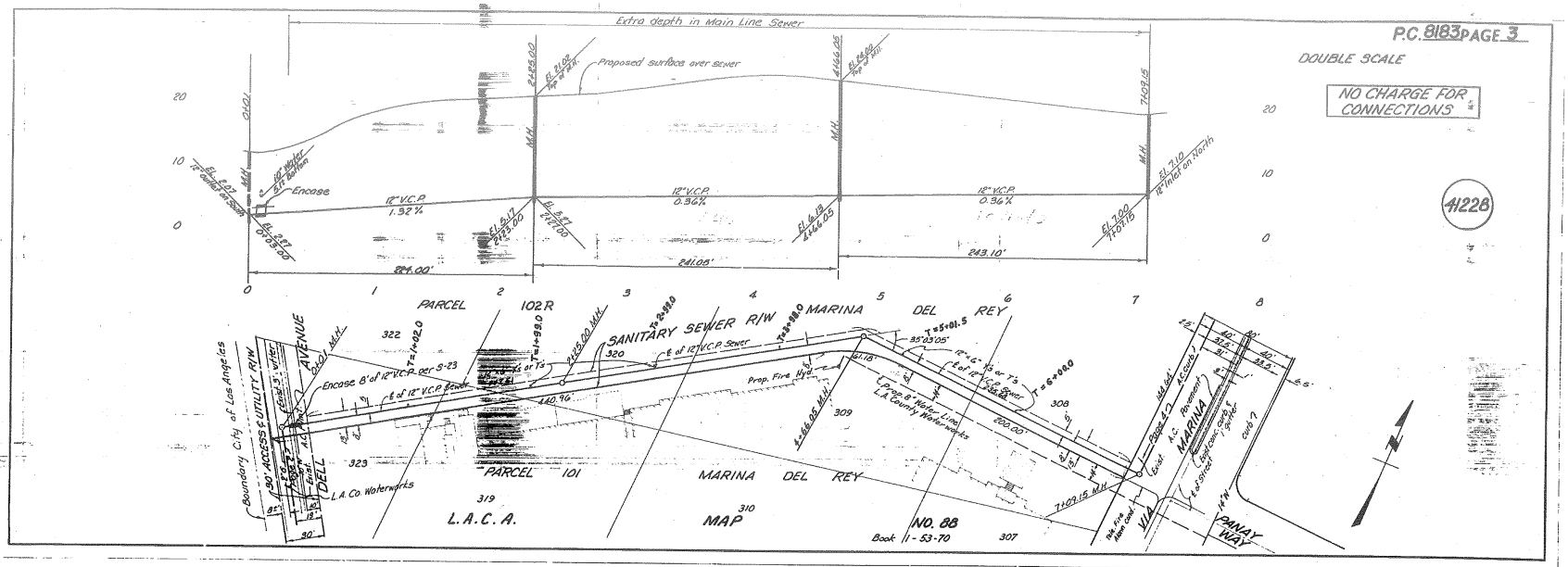
CHECKED: Ralph D. Mirelli 7/14/82

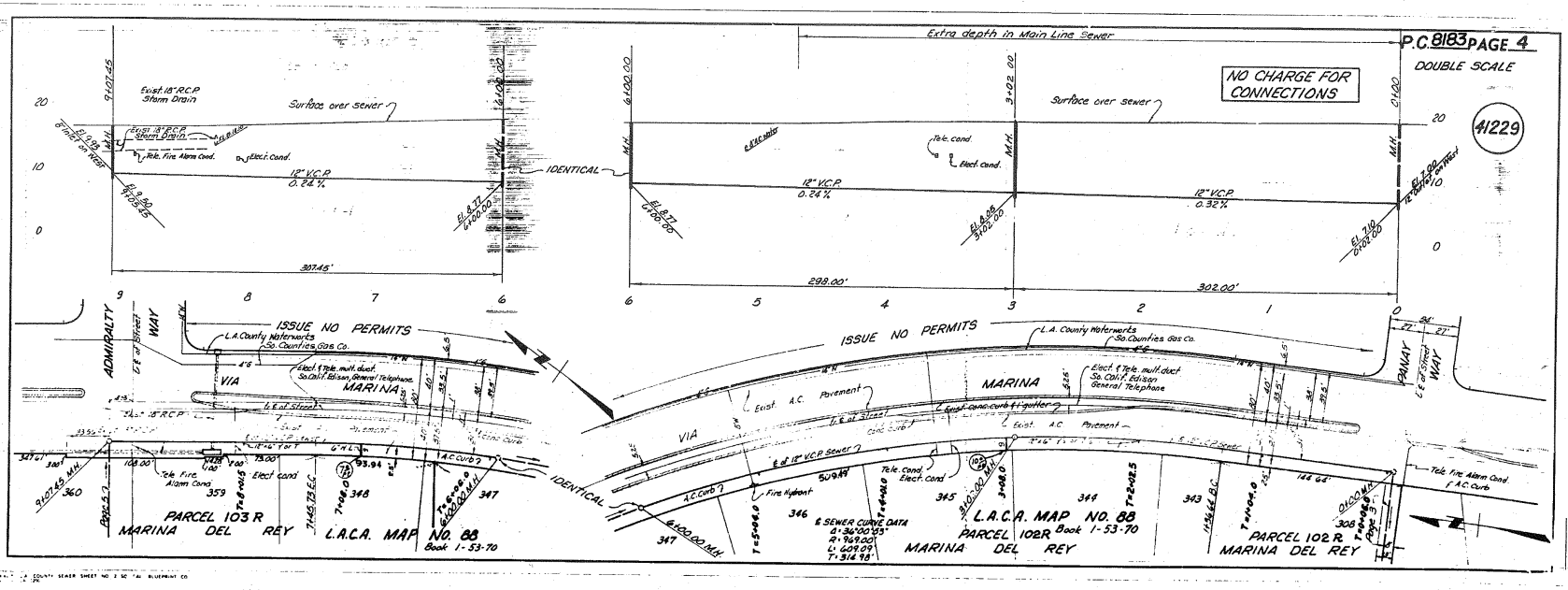
ENG. C.E. NO. 16883

LENNOX MDG. DIST. 7

P.C. 10063 PAGE 2




P.C. 8183 PAGE 3
DOUBLE SCALE
NO CHARGE FOR CONNECTIONS
41228
Extra depth in Main Line Sewer
Proposed surface over sewer
12" V.C.P. 1.92%
12" V.C.P. 0.96%
12" V.C.P. 0.96%
224.00'
241.08'
243.10'
PARCEL 102 R
MARINA DEL REY
SANITARY SEWER R/W
PARCEL 101
L.A.C.A.
MAP 310
NO. 88
Book 1-53-70
Boundary City of Los Angeles
L.A. Co. Waterworks
Prop. Fire Hyd.
Prop. 8" Water Line L.A. County Waterworks
PANAY WAY
VIA

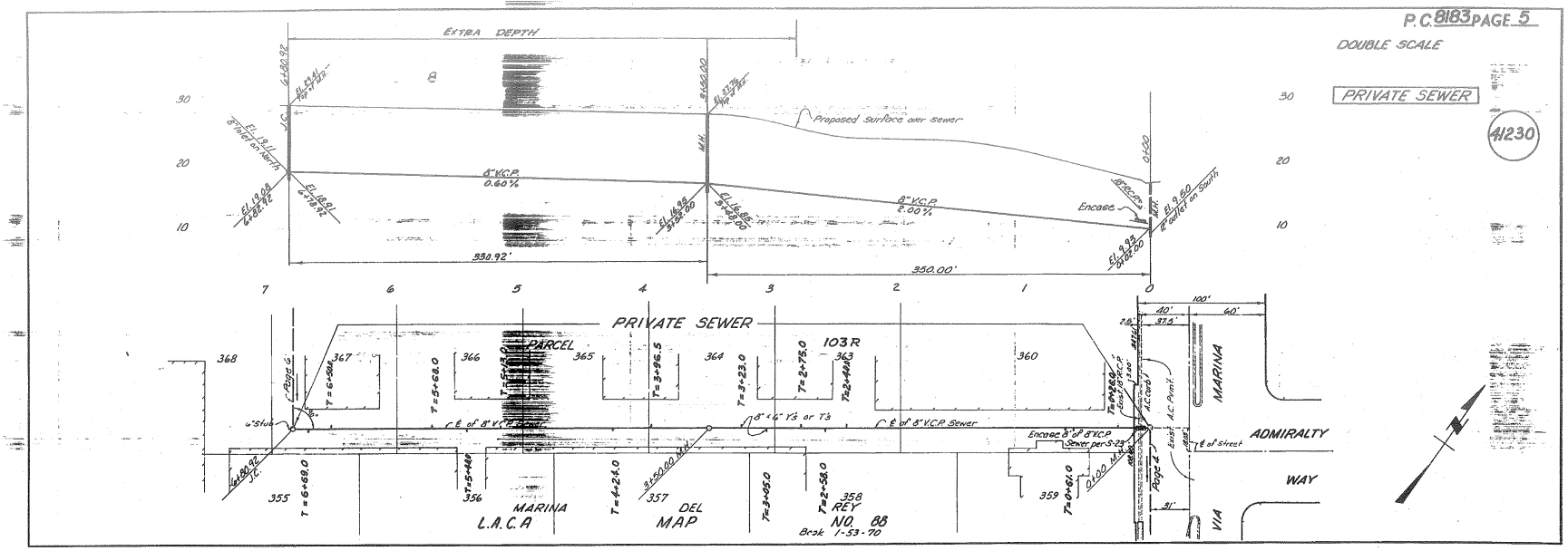

P.C. 8183 PAGE 4
DOUBLE SCALE
NO CHARGE FOR CONNECTIONS
41229
Extra depth in Main Line Sewer
Surface over sewer
Exist. 18" R.C.P. Storm Drain
12" V.C.P. 0.24%
12" V.C.P. 0.24%
12" V.C.P. 0.32%
IDENTICAL
307.45'
298.00'
302.00'
ISSUE NO PERMITS
L.A. County Waterworks
So. Counties Gas Co.
Elect. & Tele. mult. duct So. Calif. Edison, General Telephone
ADMIRALTY WAY
VIA MARINA
PANAY WAY
PARCEL 103 R MARINA DEL REY
L.A.C.A. MAP No. 88 Book 1-53-70
PARCEL 102 R MARINA DEL REY
SEWER CURVE DATA
Δ 36°00'03"
R 969.00'
L 609.09'
T 314.98'

P.C. 8183 PAGE 5

DOUBLE SCALE

PRIVATE SEWER

41230

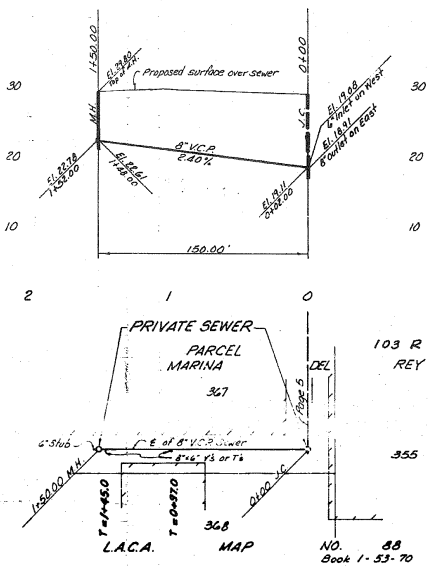


P.C. 8183 PAGE 6

DOUBLE SCALE

PRIVATE SEWER

41231



B.M. 5-29 ELEV. 10.005
F.B. 2679-94
S.W. Cor., Basin "B", Sta. 72+52.80
Bt. Spk. in Top Of Bulkhead Wall

DOUBLE SCALE
LENNOX BUILDING DISTRICT No. 7

PAGE 1
J.N. 0739.78

CASH CONTRACT NO. 8216

PROFILE, ALIGNMENT AND GRADE OF

SANITARY SEWERS

TO BE CONSTRUCTED IN

VIA MARINA

AND OTHER RIGHTS OF WAY

MARINA DEL REY

4 SHEETS, 7 PAGES

SCALE VERT. 1" = 8', HORIZ. 1" = 40' W.S. 23 MARCH 1969

COUNTY OF LOS ANGELES, CALIFORNIA

41685

JOHN A. LAMBIE COUNTY ENGINEER

APPROVED BY 3-18-69 ASS'T. DIVISION ENGINEER

REVIEWED BY SEWER MAINT. SUPT.

DESIGNED BY 3-18-69 REG. C. E. NO. 14160

ARTHUR G. WILL, DIRECTOR DEPARTMENT OF SMALL CRAFT HARBORS

APPROVED BY 7-18-69

WORK SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AND SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWERS DATE FEB. 28, 1964, AS REVISED, AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.

GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURB OR CENTER LINE OF STREET OR CENTER LINE OF ALLEY ARE SHOWN BY CIRCLES ON PROFILES AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED BY AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.

~~ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. MEAN LOWER LOW WATER OF 1929.~~

~~UNIT PRICES FOR ADDITIONAL WORK WHICH MAY BE ORDERED BY WHICH CANNOT BE ESTIMATED IN ADVANCE, SHALL BE SUBMITTED IN THE PROPOSAL.~~

THIS DRAWING AND THE DATA HEREON ARE HEREBY MADE A PART OF THE SPECIFICATIONS.

LAYOUT	Wireless		UNDERGROUND	SCOTT	
TRACED	Martinez		BENCH MARKS	BOWLEE	
CHECKED	GIBBS		MAINTENANCE	PEARSON	3/17/69
F. B. 2679, 2680			INSPECTOR		
A. B.	W. S. 23		RECORD PLANS		

USE EXTRA STRENGTH PIPE. ALL PIPE IS STANDARD BATTER EXCEPT AS NOTED.

~~USE MECHANICAL CONNECTION OF PIPE TO ALL STRUCTURE PLUS PIPE SEWERS.~~

ALL STRUCTURES SHALL BE BRICK MANHOLES, CHECKED-AS-NOTED.

USE STANDARD MANHOLE FRAMES AND COVERS, CHECKED-AS-NOTED.

AIR TEST SEWERS FOR LEAKAGE PER SECTION 7.209.6(B)OF THE STANDARD SPECIFICATIONS, AND SPECIAL PROVISIONS.

"Y" OR "T" BRANCHES MAY BE USED FOR CONNECTING TO MAINLINE SEWERS, CHECKED-AS-NOTED.

VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE "S", "P" OR "O" PER SECTION 206-2 OF THE STANDARD SPECIFICATIONS.

NO REVISIONS SHALL BE MADE IN THESE PLANS, UNLESS THE APPROVAL OF THE COUNTY ENGINEER.

(20) PROVIDE 20 CIRCLES AT SIDES OF HOUSE LATERALS INDICATE HOUSE LATERALS SHALL BE CONSTRUCTED WITH 16" MIN. FOR FOOT TO PROPERTY LINE.

~~(20) PROVIDE 20 CIRCLES AT SIDES OF HOUSE LATERALS INDICATE THE SHALL BE LAID HORIZONTALLY AND HOUSE LATERALS SHALL BE CONSTRUCTED WITH 16" MIN. FOR FOOT TO PROPERTY LINE.~~

ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AS SHOWN ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHANNELS SHALL NOT HAVE AN ANGLE OF LESS THAN 45 DEGREES WITH THE MAIN LINE SEWER.

THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE MADISON 9-4101, EXT. 51561 AT LEAST 24 HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.

THE DIRECTOR SHALL SERVE ALL APPLICABLE SPECIAL CONSTRUCTION REQUIREMENTS OF THE DEPARTMENT OF SMALL CRAFT HARBORS, MARINA DEL REY. REQUIREMENTS ARE AVAILABLE AT THE DEPARTMENT'S ADMINISTRATION BUILDING AT MARINA DEL REY.

REFER TO SECTION 7-10.4.1 OF THE STANDARD SPECIFICATIONS, REGARDING SAFETY ORDERS.

RESURFACING SCHEDULE: RESURFACE TRENCH WITHIN PAVED AREA WITH PLANT ASPHALTIC CONCRETE 3 INCHES IN THICKNESS OR 4 INCHES OF ACCEPTABLE BASE MATERIALS, EXCEPT AS NOTED BELOW.

REMOVEMENT OF ALL EXISTING SEWERS AND MANHOLES SHALL BE PER SEC. 206-5 OF STANDARD PROVISIONS.

USE CASE II BEDDING FOR ALL SEWER PIPES PER S-20.

A SOILS INVESTIGATION REPORT IS NOT AVAILABLE FOR THIS PROJECT.

PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SECURE A FEE-EXEMPT ROAD PERMIT, COUNTY ROAD DEPARTMENT, 5530 W. 63RD STREET, LOS ANGELES, 90046.

PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SECURE A FEE-EXEMPT CONSTRUCTION PERMIT, COUNTY ENGINEER SANITATION DIVISION, ROOM 310, 108 W. REGOND STR., LOS ANGELES, 90012.

ALL CONCRETE CROSS GUTTERS, CURBS, GUTTERS, SIDEWALKS, AND REPAIRING SHALL BE FURNISHED OR INCLUDED PER LOS ANGELES COUNTY ROAD DEPARTMENT STANDARDS.

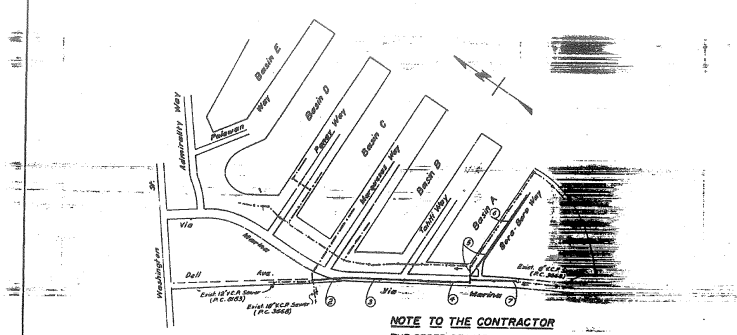
THE FOLLOWING LATEST REVISED STANDARD PLANS ON FILE IN THE OFFICE OF COUNTY ENGINEER SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT.

LEGEND	S-1
MINIMUM PUBLIC SAFETY REQUIREMENTS	S-2
BRICK MANHOLE	S-3
MANHOLE FRAME AND COVER	S-10
MANHOLE STEP	S-17
BEDDING FOR SEWER PIPE	S-31
SPECIAL SUPPORT AND PROTECTION	S-32
CRADLING AND ENCASEMENT	S-33
STANDARD WYE SUPPORT	S-36
ALLOWABLE TRENCH WIDTHS	S-39
STUMPS	S-66

THE UNDERGROUND UTILITY COMPANIES WITHIN THE LIMITS OF THIS PROJECT ARE AS FOLLOWS:

(1) L. A. County Water Works
(2) So. Counties Gas Co.
(3) So. Calif. Edison Co. & General Telephone.
(4)

NO CHARGE FOR CONNECTIONS



INDEX MAP
NO SCALE

C.C. 8216
J.N. 0739.78

NOTE TO THE CONTRACTOR

THE ORDER OF WORK ON THIS PROJECT SHALL BE AS FOLLOWS:

1. Construct all main line sewer and appurtenances complete in place, including backfill, as shown on pages 5B and 6.
2. Construct all main line sewer and appurtenances complete in place, including backfill, as shown on pages 5A and 7.
3. Construct all main line sewer and appurtenances complete in place, including backfill, as shown on pages 2, 3 and 4.
4. Reconstruct channel in base at junction chamber as shown in detail on pg. 7.

No subsequent order of work is to commence until the previous order is completed.

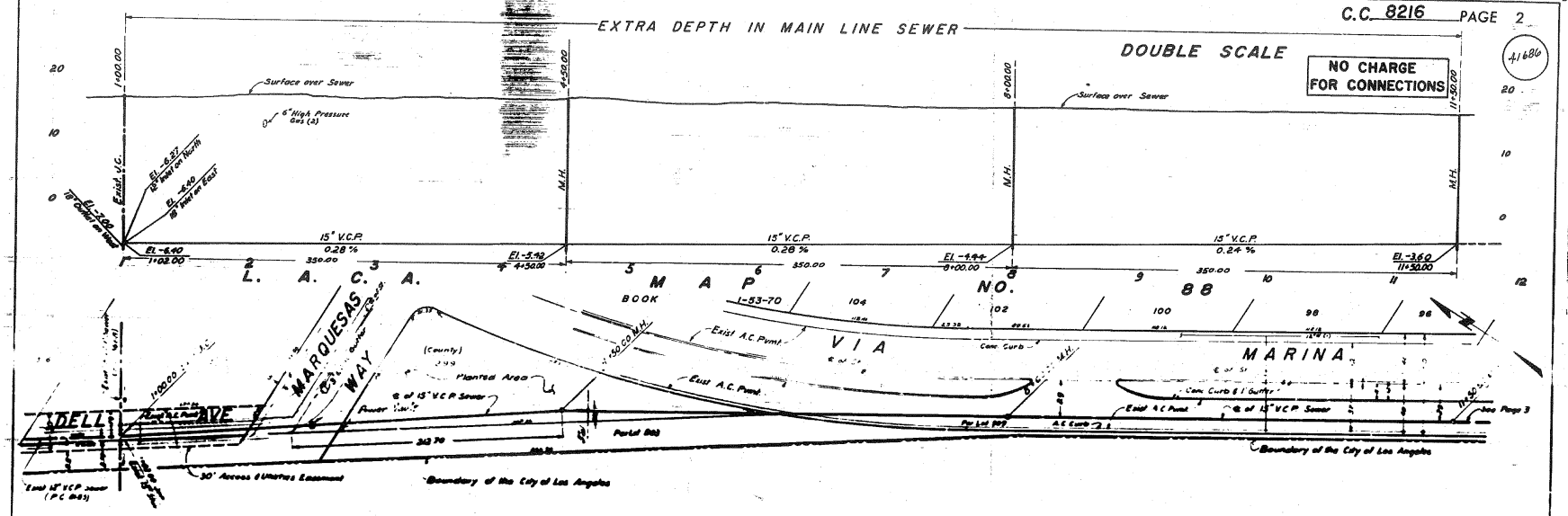
C.C. 8216 PAGE 2

41686

EXTRA DEPTH IN MAIN LINE SEWER

DOUBLE SCALE

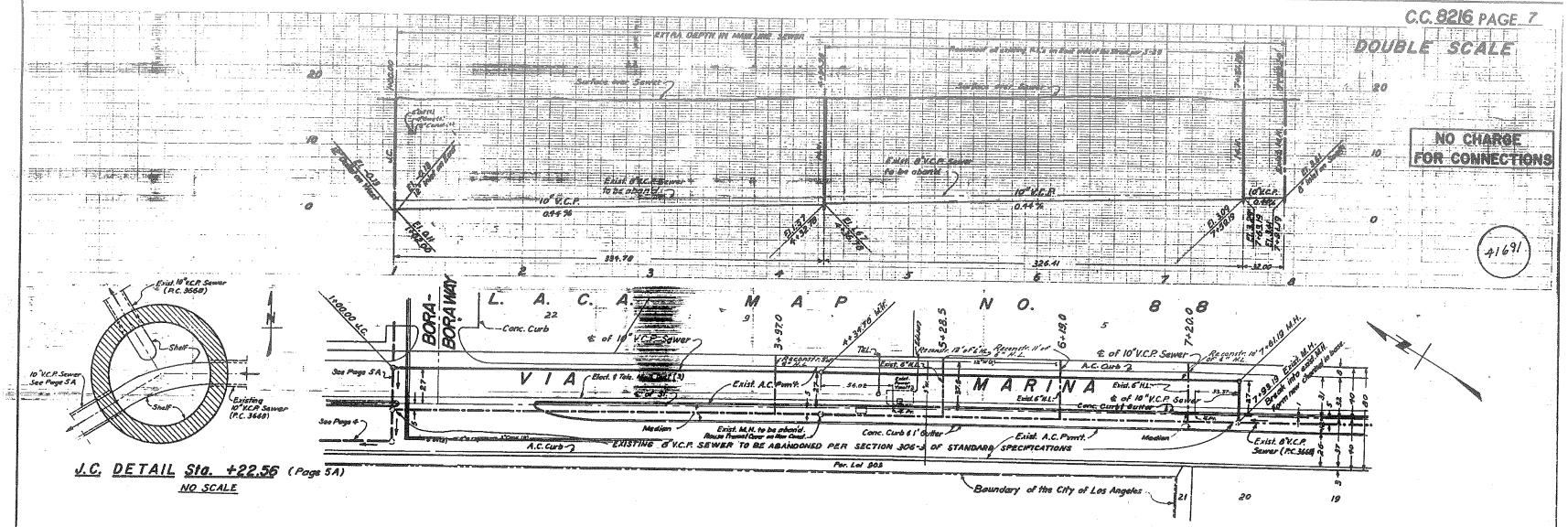
NO CHARGE FOR CONNECTIONS



DOUBLE SCALE

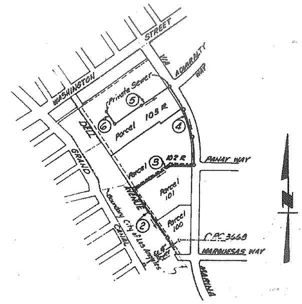
NO CHARGE FOR CONNECTIONS

41691



PAGE

B.M. "O" ELEV. 20.658 M.L.L.W
VIA MARINA & ADMIRALTY WAY 80'S & 6'W & INT. (CONST. ℄) TOP
NVY VENT FD. CONC. NAIL 57 07 PER L.A.C. Rd. DEPT. L.B 1014
PAGE 4



INDEX MAP
Scale: 1"=600'
P.C. 8183

The following latest revised Standard Plans on file in the office of County Engineer shall apply in the construction of this project:

Legend	S-1
Minimum Public Safety Requirements	S-2
Brick Manhole	S-3
Non-reinforced Precast Concrete Manhole	S-5
Reinforced Precast Concrete Manhole	S-6
Manhole Frame and Cover	S-15
Standard Manhole Step	S-17
Bedding for Sewer Pipe	S-21
Cradling and Encasement	S-23
Wye or Tee Support	S-26
Allowable Trench Widths	S-33

REVISION NO. 3 - March 27, 1969
Revised grade of sewer bet. Sta. 0+00 and Sta. 7+09 on Page 2 and bet. Sta. 0+01 and Sta. 2+25 on Page 3 due to interference with water line on Page 3.
APPROVED [signature] R.C.E. 10653
Office of County Engineer

REVISION NO. 2 - MARCH 12, 1969
Revised alignment of Sewer on Page 2 between Sta. 0+00.00 and Sta. 7+09.06 due to interference with gas line.
APPROVED [signature] 10653
Office of County Engineer R.C.E. No.

REVISION NO. 1 - Feb. 18, 1969
Revised grade of Private Sewer between Sta. 0+00 and Sta. 6+81 on Page 5 and between Sta. 0+00 and Sta. 1+50 on Page 6.
APPROVED [signature] 10653
Office of County Engineer R.C.E. No.

DOUBLE SCALE
LENNOX BLDG. DIST. NO. 7

NOTES:
1. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
2. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
3. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND "T" OR "Y" BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
4. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
5. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
6. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE, MADISON 9-4747, EXT. 81181, AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
7. ALL STRUCTURES SHALL BE EITHER BRICK MANHOLES PER S-3 OR PRECAST CONCRETE MANHOLES PER S-5 OR S-6, EXCEPT AS NOTED.
8. "T"OR"Y" BRANCH MAY BE USED FOR CONNECTIONS TO MAINLINE SEWERS EXCEPT AS NOTED.
9. MANHOLE TOPS IN UNIMPROVED RIGHTS-OF-WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
10. USE EXTRA STRENGTH PIPE. ALL PIPE IS STANDARD DEPTH EXCEPT AS NOTED.
11. VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE "D," "F", OR "G" PER STANDARD SPECIFICATIONS SECTION 208-2.
12. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-23, TWO FEET ON EACH SIDE FROM THE POINT OF INTERFERENCE.
13. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-23, UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.
14. ~~HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 6 FEET BELOW CURB GRADE EXCEPT AS NOTED.~~
15. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY ROAD DEPT. OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
16. SEWERS TO BE TESTED FOR LEAKAGE PER SECTION 306-2.3.7 OF THE STANDARD SPECIFICATIONS.
17. REFER TO SECTION 7-10.4.1 OF THE STANDARD SPECIFICATIONS, REGARDING SAFETY ORDERS.
18. SPECIAL BACKFILL IN DESIGNATED AREAS:
(a) BACKFILL TRENCH AND REPLACE OTHER EARTH REMOVED SO AS TO ACHIEVE THE NATURAL OR FINISHED GRADES AND SLOPES SHOWN ON THE GRADING PLAN APPROVED FOR THIS TRACT BY THE BUILDING AND SAFETY DIVISION.
(b) ALL BACKFILL AND EARTH REPLACED SHALL BE COMPACTED TO A MINIMUM OF 90% OF MAXIMUM DENSITY PER A.S.T.M. STANDARD METHOD OF TEST D698-57T AS MODIFIED, ACCEPTABLE CERTIFICATION OF SUCH COMPACTION SHALL BE SUBMITTED TO THE CONSTRUCTION DIVISION.
19. ALL JOINTS BETWEEN CAST IRON PIPE AND VITRIFIED CLAY PIPE SHALL BE MADE WITH A RUBBER SLEEVE JOINT, TYPE "C" OR "D", (WITH BUSHING IF NECESSARY) PER STANDARD SPECIFICATIONS, SECTION 208-2
20. THE CONTRACTOR SHALL MEET ALL APPLICABLE SPECIAL CONSTRUCTION REQUIREMENTS OF THE DEPARTMENTS OF SMALL CRAFT HARBORS, MARINA DEL REY, REQUIREMENTS ARE AVAILABLE AT THE DEPARTMENTS ADMINISTRATION BUILDING, MARINA DEL REY.

COLLECT CHARGES AS INDICATED
[signature]

PROFILE ALIGNMENT AND GRADE OF
SANITARY SEWERS
TO BE CONSTRUCTED IN
PARCELS NO. 23S, 24, and 101 MARINA DEL REY
PRIVATE CONTRACT NO. 8183

P.C. 8183
PAGE 1

W.S. 23
3 SHEETS; 9 PAGES
SCALE: VERT. 1"=4' HORIZ. 1"=40' October 25, 1968

(41226)

PREPARED IN THE OFFICES OF
JENNINGS ENGINEERING COMPANY
4419 VAN NUYS BOULEVARD, SUITE 200
SHERMAN OAKS, CALIFORNIA 91403
By: E. J. Jennings
REG. C. E. NO. 7852

FOR LEGEND SEE PLAN NO. S-1

NOTE:
GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.
ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.
THIS DRAWING AND THE DATA HEREON ARE HEREBY MADE A PART OF THE SPECIFICATIONS.
WORK SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AND SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWERS DATE FEB. 15, 1966, AS REVISED, AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.
BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L.A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 3, AND PAY A FEE TO THE COUNTY ENGINEER, ROOM 130, COUNTY ENGINEERING BUILDING, 108 WEST SECOND STREET LOS ANGELES, CALIFORNIA 90012 SUFFICIENT TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.
APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.
IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.

COUNTY OF LOS ANGELES, CALIFORNIA
JOHN A. LAMBIE, COUNTY ENGINEER
ARTHUR G WILL, DIRECTOR
DEPARTMENT OF SMALL CRAFT HARBORS

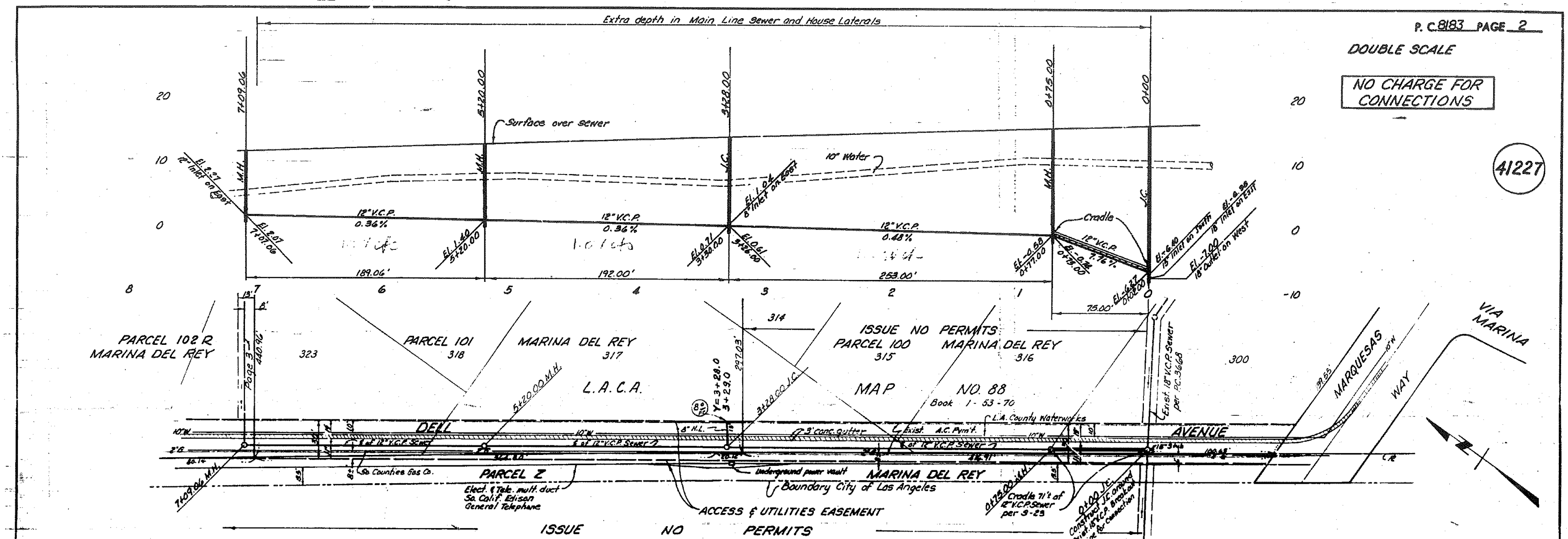
APPROVED BY [signature] 1-8-69
ASSISTANT SANITATION ENGINEER
APPROVED BY [signature]
REVIEWED BY [signature]
SEWER MAINT. SUPT.
CHECKED BY [signature] 1-8-69
REG. C.E. NO. 14390

J. N. 0369.42

P. C. 8183 PAGE 2
DOUBLE SCALE

NO CHARGE FOR CONNECTIONS

(41227)



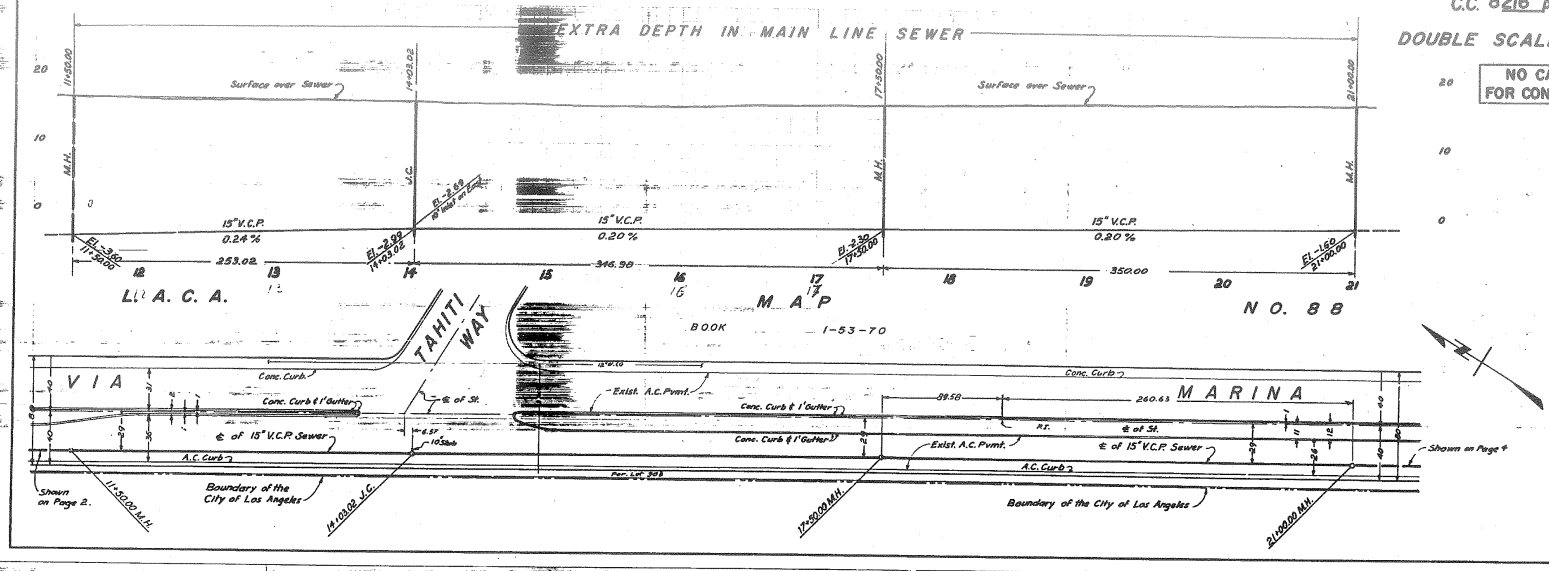
SEWER SHEET NO. 1 SOUTHERN CALIFORNIA BLUEPRINT CO.

C.C. 8216 PAGE 3

DOUBLE SCALE

NO CARGE FOR CONNECTIONS

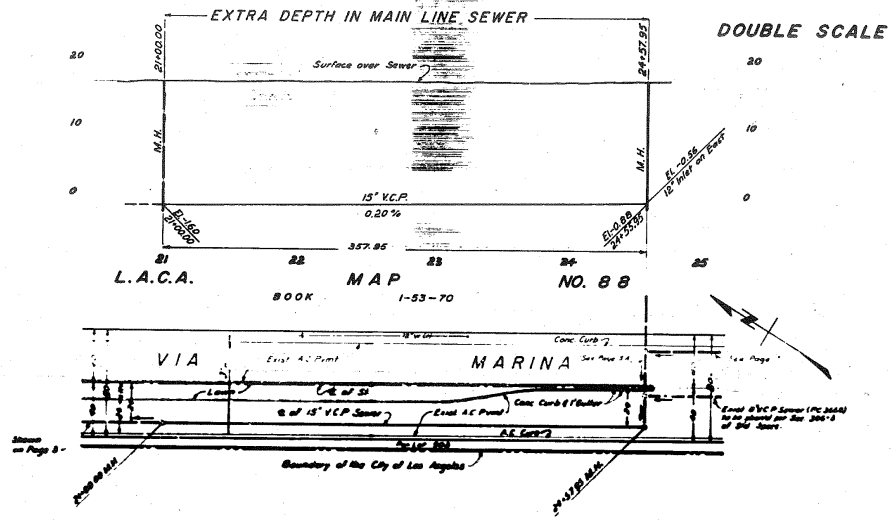
41687

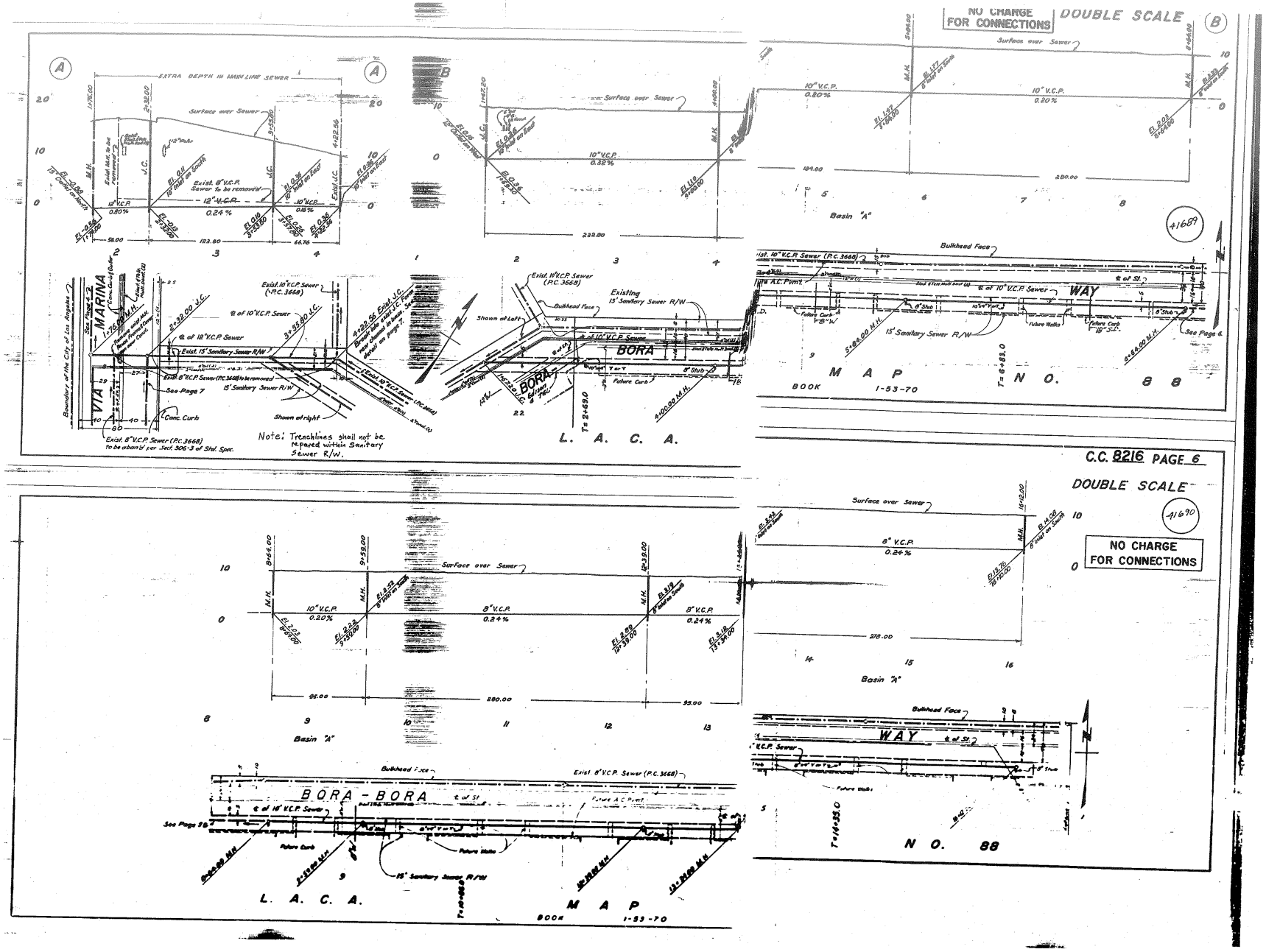


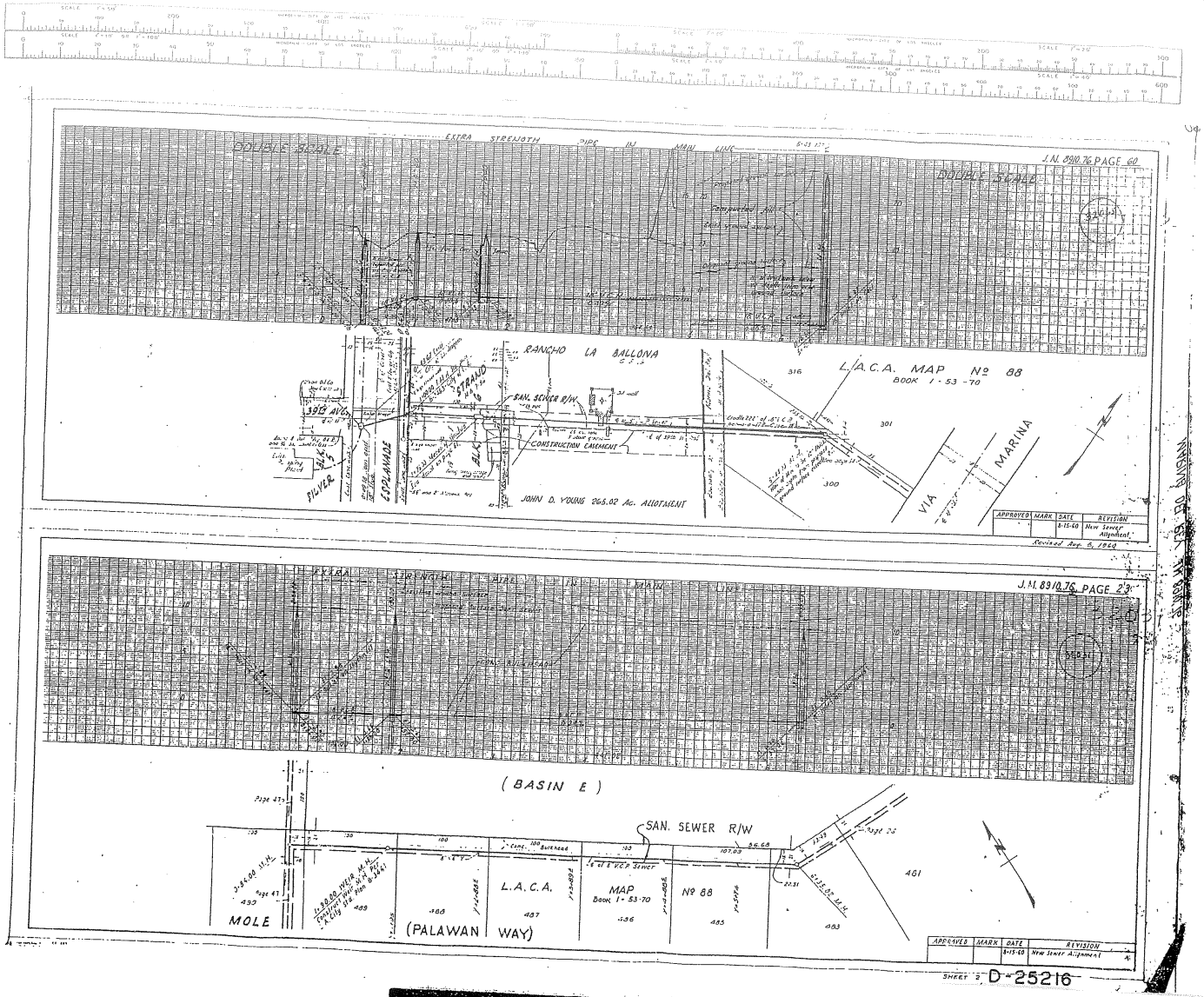
C.C. 8216 PAGE 4

41688

NO CHARGE FOR CONNECTIONS




NO CHARGE FOR CONNECTIONS
DOUBLE SCALE
C.C. 8216 PAGE 6
DOUBLE SCALE
NO CHARGE FOR CONNECTIONS
EXTRA DEPTH IN MAIN LINE SEWER
Surface over Sewer
Exist. 8" V.C.P. Sewer To be removed
12" V.C.P.
10" V.C.P.
8" V.C.P.
0.20%
0.24%
0.18%
0.32%
Basin "A"
VIA MARINA
BORA BORA
WAY
Bulkhead Face
Exist. 10" V.C.P. Sewer (P.C. 3668)
Exist. 8" V.C.P. Sewer (P.C. 3668)
Existing 15' Sanitary Sewer R/W
15' Sanitary Sewer R/W
Future Walks
Future Curb
Note: Trenchlines shall not be repaved within Sanitary Sewer R/W.
L. A. C. A.
MAP NO. 88
BOOK 1-53-70
See Page 6
See Page 7



D-25216

Capital Project No. 8910.76, Marina Del Rey (Page 60)

REPORTS

15" Sewer Pipe from Manhole 65 to 66
Worksheet for Circular Channel

Project Description	
Worksheet	15" Sewer Pipe from Manhole
Flow Element	Circular Channel
Method	Kutter's Formula
Solve For	Discharge

Input Data		
Kutter's n Coefficie	0.013	
Channel Slope	002400	ft/ft
Depth	0.91	ft
Diameter	14.5	in

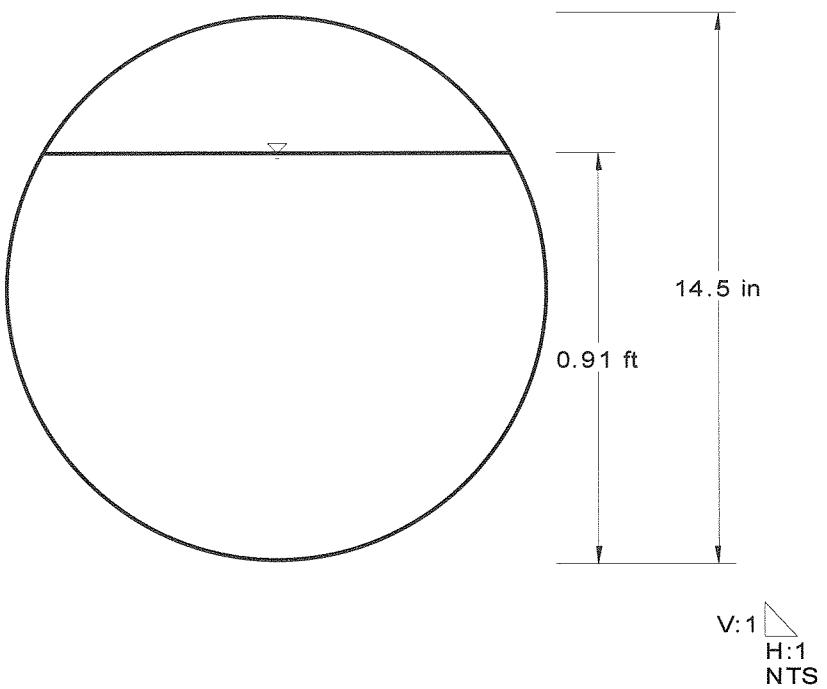
Results		
Discharge	2.59	cfs
Flow Area	0.9	ft²
Wetted Perime	2.53	ft
Top Width	0.00	ft
Critical Depth	0.65	ft
Percent Full	75.0	%
Critical Slope	0.006297	ft/ft
Velocity	2.80	ft/s
Velocity Head	0.12	ft
Specific Energ:	1.03	ft
Froude Numbe	0.53	
Maximum Disc	3.04	cfs
Discharge Full	2.79	cfs
Slope Full	0.002061	ft/ft
Flow Type	Subcritical	

Notes: VIA MARINA

15" Sewer Pipe from Manhole 65 to 66
Cross Section for Circular Channel

Project Description	
Worksheet	15" Sewer Pipe from Manhole
Flow Element	Circular Channel
Method	Kutter's Formula
Solve For	Discharge

Section Data		
Kutter's n Coefficie	0.013	
Channel Slope	002400	ft/ft
Depth	0.91	ft
Diameter	14.5	in
Discharge	2.59	cfs



15" Sewer Pipe from Manhole 66 to 67
Worksheet for Circular Channel

Project Description	
Worksheet	15" Sewer Pipe from Manhole
Flow Element	Circular Channel
Method	Kutter's Formula
Solve For	Discharge

Input Data		
Kutter's n Coefficie	0.013	
Channel Slope	002400	ft/ft
Depth	0.91	ft
Diameter	14.5	in

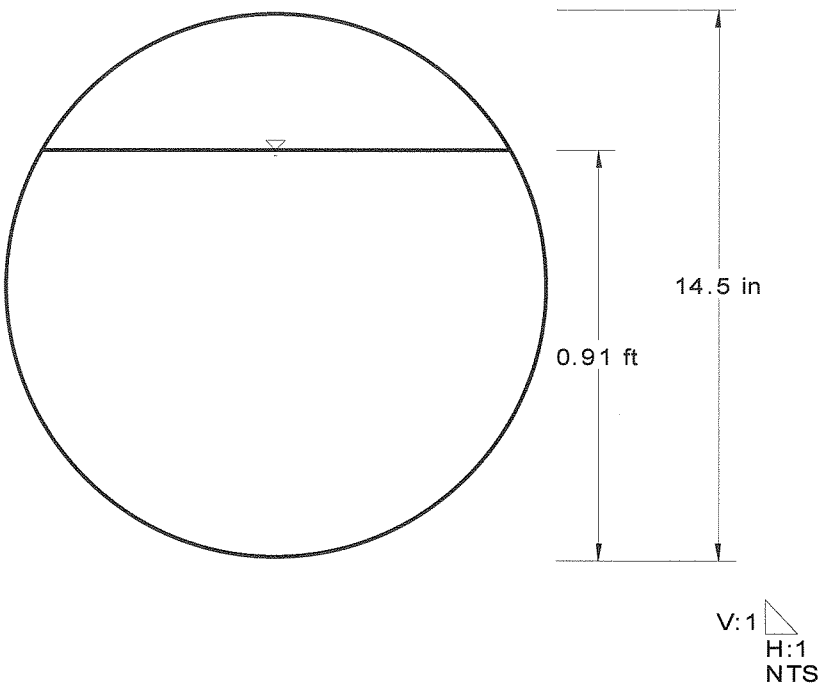
Results		
Discharge	2.59	cfs
Flow Area	0.9	ft²
Wetted Perime	2.53	ft
Top Width	0.00	ft
Critical Depth	0.65	ft
Percent Full	75.0	%
Critical Slope	0.006297	ft/ft
Velocity	2.80	ft/s
Velocity Head	0.12	ft
Specific Energ	1.03	ft
Froude Numbe	0.53	
Maximum Disc	3.04	cfs
Discharge Full	2.79	cfs
Slope Full	0.002061	ft/ft
Flow Type	Subcritical	

Notes: VIA MARINA

15" Sewer Pipe from Manhole 66 to 67
Cross Section for Circular Channel

Project Description	
Worksheet	15" Sewer Pipe from Manhole
Flow Element	Circular Channel
Method	Kutter's Formula
Solve For	Discharge

Section Data		
Kutter's n Coefficie	0.013	
Channel Slope	002400	ft/ft
Depth	0.91	ft
Diameter	14.5	in
Discharge	2.59	cfs



15" Sewer Pipe from Manhole 67 to 68
Worksheet for Circular Channel

Project Description	
Worksheet	15" Sewer Pipe from Manhole
Flow Element	Circular Channel
Method	Kutter's Formula
Solve For	Discharge

Input Data		
Kutter's n Coefficie	0.013	
Channel Slope	002800	ft/ft
Depth	0.91	ft
Diameter	14.5	in

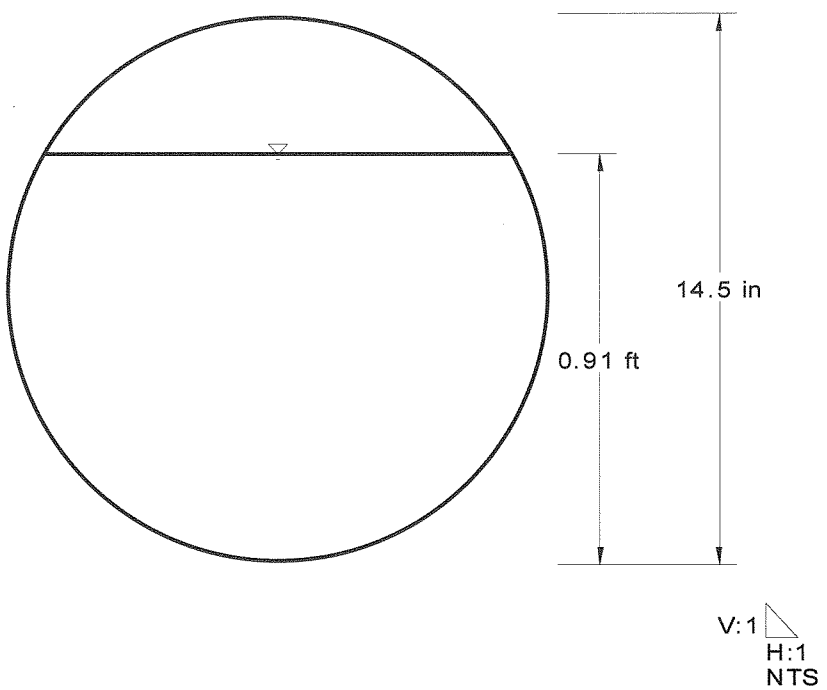
Results		
Discharge	2.80	cfs
Flow Area	0.9	ft²
Wetted Perime	2.53	ft
Top Width	0.00	ft
Critical Depth	0.68	ft
Percent Full	75.0	%
Critical Slope	0.006425	ft/ft
Velocity	3.03	ft/s
Velocity Head	0.14	ft
Specific Energ	1.05	ft
Froude Numbe	0.57	
Maximum Disc	3.29	cfs
Discharge Full	3.02	cfs
Slope Full	0.002404	ft/ft
Flow Type	Subcritical	

Notes: VIA MARINA

15" Sewer Pipe from Manhole 67 to 68
Cross Section for Circular Channel

Project Description	
Worksheet	15" Sewer Pipe from Manhole
Flow Element	Circular Channel
Method	Kutter's Formula
Solve For	Discharge

Section Data		
Kutter's n Coefficie	0.013	
Channel Slope	002800	ft/ft
Depth	0.91	ft
Diameter	14.5	in
Discharge	2.80	cfs



15" Sewer Pipe from Manhole 68 to 69
Worksheet for Circular Channel

Project Description	
Worksheet	15" Sewer Pipe from Manhole
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Mannings Coeffic	0.013	
Channel Slope	002800	ft/ft
Depth	0.91	ft
Diameter	14.5	in

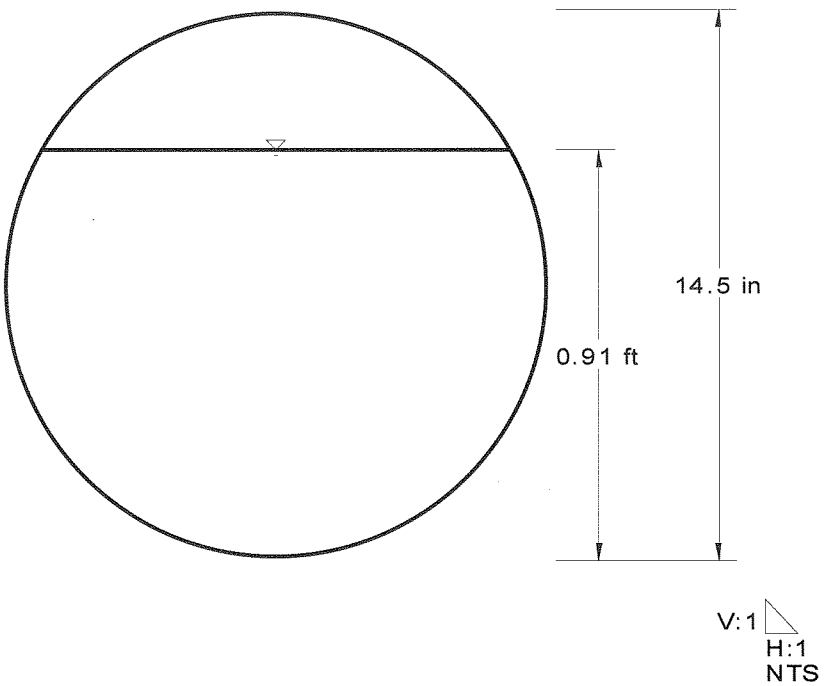
Results		
Discharge	2.85	cfs
Flow Area	0.9	ft²
Wetted Perime	2.53	ft
Top Width	0.00	ft
Critical Depth	0.68	ft
Percent Full	75.0	%
Critical Slope	0.006161	ft/ft
Velocity	3.09	ft/s
Velocity Head	0.15	ft
Specific Energ	1.05	ft
Froude Numbe	0.58	
Maximum Disc	3.36	cfs
Discharge Full	3.12	cfs
Slope Full	0.002328	ft/ft
Flow Type	Subcritical	

Notes: VIA MARINA

15" Sewer Pipe from Manhole 68 to 69
Cross Section for Circular Channel

Project Description	
Worksheet	15" Sewer Pipe from Manhole
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Mannings Coeffic	0.013	
Channel Slope	002800	ft/ft
Depth	0.91	ft
Diameter	14.5	in
Discharge	2.85	cfs



18" Sewer Pipe from Manhole 69 to Metering Structure
Worksheet for Circular Channel

Project Description	
Worksheet	18" Sewer Pipe from Manhole 69 to Mete
Flow Element	Circular Channel
Method	Kutter's Formula
Solve For	Discharge

Input Data		
Kutter's n Coefficie	0.013	
Channel Slope	004000	ft/ft
Depth	1.09	ft
Diameter	17.5	in

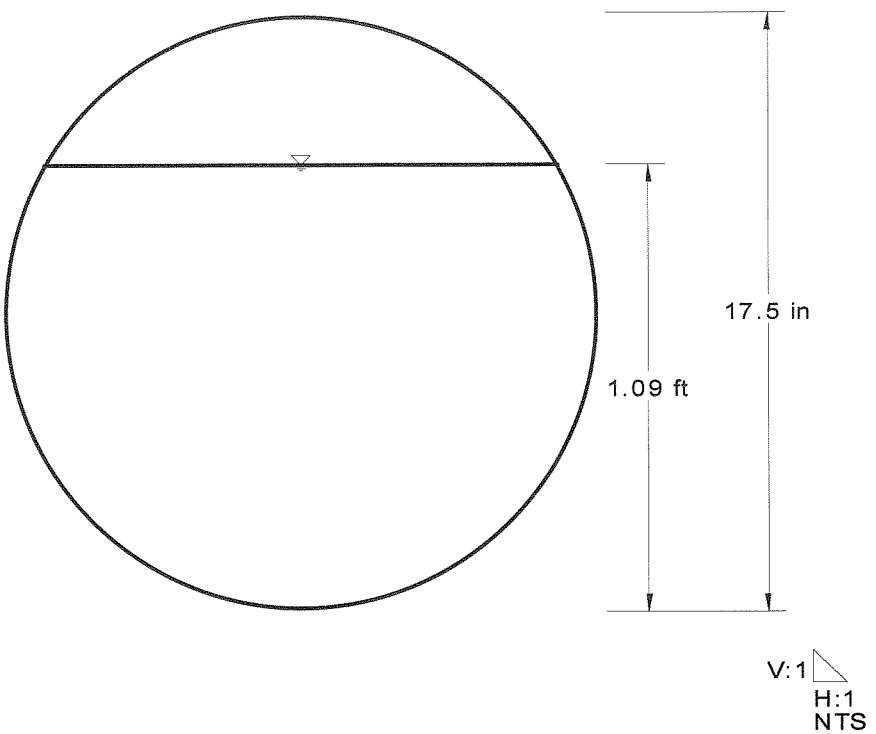
Results		
Discharge	5.57	cfs
Flow Area	1.3	ft²
Wetted Perime	3.05	ft
Top Width	0.00	ft
Critical Depth	0.92	ft
Percent Full	74.7	%
Critical Slope	0.006356	ft/ft
Velocity	4.16	ft/s
Velocity Head	0.27	ft
Specific Energ	1.36	ft
Froude Numbe	0.71	
Maximum Disc	6.59	cfs
Discharge Full	6.06	cfs
Slope Full	0.003387	ft/ft
Flow Type	Subcritical	

Notes: MARQUESAS WAY TO DELL VIA DOLCE

18" Sewer Pipe from Manhole 69 to Metering Structure
Cross Section for Circular Channel

Project Description	
Worksheet	18" Sewer Pipe from Manhole 69 to Mete
Flow Element	Circular Channel
Method	Kutter's Formula
Solve For	Discharge

Section Data		
Kutter's n Coefficie	0.013	
Channel Slope	004000	ft/ft
Depth	1.09	ft
Diameter	17.5	in
Discharge	5.57	cfs



Proposed Sewer Pipe from Parcel 9U to Existing 15" Sewer Line
Worksheet for Circular Channel

Project Description	
Worksheet	Proposed Sewer Pipe from Parcel 9U to Existing 1
Flow Element	Circular Channel
Method	Kutter's Formula
Solve For	Channel Depth

Input Data		
Kutter's n Coefficie	0.013	
Channel Slope	002400	ft/ft
Diameter	9.5	in
Discharge	0.24	cfs

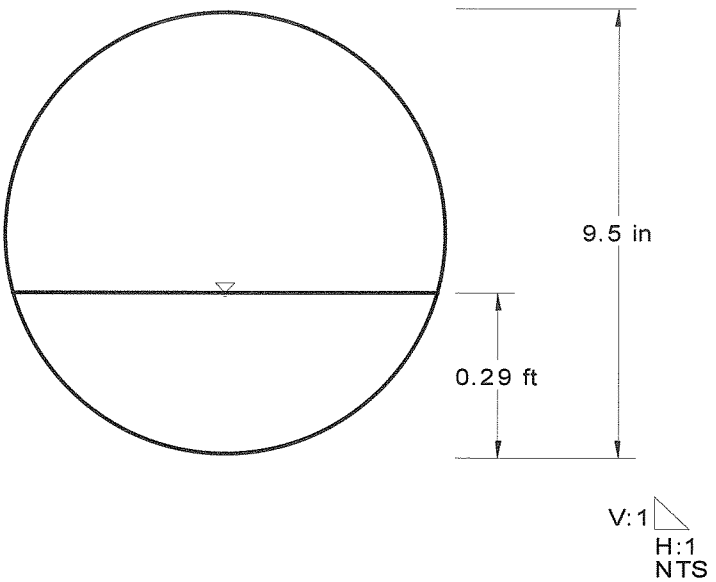
Results		
Depth	0.29	ft
Flow Area	0.2	ft²
Wetted Perime	1.03	ft
Top Width	0.00	ft
Critical Depth	0.21	ft
Percent Full	36.5	%
Critical Slope	0.007834	ft/ft
Velocity	1.48	ft/s
Velocity Head	0.03	ft
Specific Energ	0.32	ft
Froude Numbe	0.56	
Maximum Disc	0.95	cfs
Discharge Full	0.87	cfs
Slope Full	0.000216	ft/ft
Flow Type	Subcritical	

Notes: WOODFIN HOTEL TO EXISTING LINE ON VIA MARINA

Proposed Sewer Pipe from Parcel 9U to Existing 15" Sewer Line
Cross Section for Circular Channel

Project Description	
Worksheet	Proposed Sewer Pipe from Parcel 9U to Existing 1
Flow Element	Circular Channel
Method	Kutter's Formula
Solve For	Channel Depth

Section Data		
Kutter's n Coefficie	0.013	
Channel Slope	002400	ft/ft
Depth	0.29	ft
Diameter	9.5	in
Discharge	0.24	cfs



Wastewater Generation for Pacels 10R and FF

Neptune Marina Apartments and Anchorage Project
Existing Wastewater Generation

Land Use	Quantity	Units	Generation Rate (1)		Total Waste Water Generated	
			(acre-feet/year)	(gal./day/unit)	(acre-feet/year)	(gal./day)
Residential Units						
Multi-Family	136	du	0.1700	150.00	23	20,400
Boat Slips	198	slips				
				Totals	**23**	**20,400**

du = dwelling unit

Prepared by Impact Sciences, Inc.
5/2/05

Neptune Marina Apartments and Anchorage Project
Project Wastewater Generation

Land Use	Quantity	Units	Generation Rate (1)		Total Wastewater Generated	
			(acre-feet/year)	(gal./day/unit)	(acre-feet/year)	(gal./day)
Neptune Marina						
Proposed						
1-Bedroom	216	du	0.1700	150.00	37	32,400
2-Bedroom	156		0.2240	200.00	35	31,200
3-Bedroom	28		0.2800	250.00	8	7,000
Boat Slips	161	slips				
Subtotal					80	70,600
Existing						
Apartments	-136	du	0.1700	150.00	-23	-20,400
Boat Slips	-198	slips				
Subtotal						
Net						
1-Bedroom	80	du	0.1700	150.00	14	12,000
2-Bedroom	156		0.2240	200.00	35	31,200
3-Bedroom	28		0.2800	250.00	8	7,000
Boat Slips	-37	slips				
				Totals	**8**	**50,200**

du = dwelling unit
(1) The generation factor is from the Marina del Rey Apartment Community Draft EIR, Impact Sciences, May, 2000, unless other wise noted.

Prepared by Impact Sciences, Inc.
5/2/05

Neptune Marina Phase II
Project Wastewater Generation

Land Use	Quantity	Units	Generation Rate (1)		Total Wastewater Generated	
			(acre-feet/year)	(gal./day/unit)	(acre-feet/year)	(gal./day)
Neptune Marina Phase II						
Proposed						
1-Bedroom	94	du	0.1700	150.00	16	14,100
2-Bedroom	8		0.2240	200.00	2	1,600
3-Bedroom	24		0.2800	250.00	7	6,000
Subtotal					24	21,700
				Totals	**24**	**21,700**

du = dwelling unit
(1) The generation factor is from the Marina del Rey Apartment Community Draft EIR, Impact Sciences, May, 2000, unless other wise noted.

Prepared by Impact Sciences, Inc.
5/2/05

Neptune Marina Apartments and Anchorage and Neptune Marina Phase II
Cumulative and Project Wastewater Generation

Land Use	Quantity	Units	Generation Rate (1)		Total Wastewater Generated	
			(acre-feet/year)	(gal./day/unit)	(acre-feet/year)	(gal./day)
Neptune Marina (net)						
1-Bedroom	80	du	0.1700	150.00	14	12,000
2-Bedroom	156	du	0.2240	200.00	35	31,200
3-Bedroom	28	du	0.2800	250.00	8	7,000
Boat Slips	-37	slips				
Subtotal					56	50,200
Neptune Marina Phase II						
1-Bedroom	94	du	0.1700	150.00	16	14,100
2-Bedroom	8	du	0.2240	200.00	2	1,600
3-Bedroom	24	du	0.2800	250.00	7	6,000
Subtotal					24	21,700
Proposed						
Residential Units:						
Multi-Family or Attached (2)	4,122	du	0.1700	150.00	701	618,300
Hotel/Motel	421	room	0.1400	125.00	59	52,625
Commercial/Industrial						
Commercial	146,068	sq. ft.	0.0001	0.10	15	14,607
Restaurant (3)	11,063	sq. ft.	0.0011	1.00	12	11,063
Office	197,058	sq. ft.	0.0002	0.20	39	39,412
Boat Slips	439	slips				
Subtotal					826	736,006
				Totals	**830**	**829,606**

Note: Numbers may not total exactly due to rounding.
du = dwelling unit; sq.ft. - square feet
(1) The generation factor is from the Marina del Rey Apartment Community Draft EIR, Impact Sciences, May, 2000, unless other wise noted.
(2) Includes senior care facilities.
(3) The generation factor is from the Los Angeles County Sanitation Districts, Loadings for Each Class of Land Use (1998-99).

Prepared by Impact Sciences, Inc.
5/2/05

APPENDIX 5.9

Water Service

Water Supply Assessment

County of Los Angeles Department of Public Works

Waterworks District 29 and Marina Del Rey Water System

DRAFT

Water Supply Assessment

Legacy Woodfin Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project

Prepared by Impact Sciences, Inc.

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Camarillo, California 93012

(805) 523-8692

February 2008

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1.0 INTRODUCTION

This report is a Water Supply Assessment (WSA) prepared at the request of the County of Los Angeles for the proposed Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project (Project). The report has been drafted pursuant to requirements of Senate Bill 610 (Costa, Chapter 3, Stats. 2001) (SB 610) which requires public water systems which may supply water to certain proposed development projects to prepare a water supply assessment for use by the planning agency in compliance with the California Environmental Quality Act (CEQA).

1.1 Background

The proposed project consists of development on Marina del Rey Parcels 10R, FF, and 9U, located in an unincorporated portion of Los Angeles County along the Pacific coast in the western portion of the Los Angeles basin. Marina del Rey is an approximately 800-acre area that includes residential, recreational, and commercial uses on land, and in the water a small-watercraft harbor. Marina del Rey is owned by the County of Los Angeles.

Implementation of the proposed Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project (proposed project) would result in the development of 526 residential dwelling units, a 19-story building with 288 hotel and timeshare suites, 174 private and between 7 and 11 public/transient boat spaces and a 1.46-acre public park inclusive of a 0.47-acre restored wetland and 0.99-acre upland buffer. There are 136 existing apartments and 198 boat spaces presently on site. Therefore, completion of the proposed project would result in a net increase of 390 apartment units, 288 hotel and timeshare suites, a net decrease of up to 17 boat spaces, and creation of a 1.46-acre public park.

Once it is determined that a project is subject to CEQA and triggers the requirements of SB 610, a lead agency must identify any public water system that may supply water for the project and request that public water systems prepare a specified water supply assessment to be included in an environmental document prepared for the project. The assessment should identify water supply for the proposed project and water received in prior years pursuant to those entitlements, rights, and contracts.

Los Angeles County Waterworks District 29, Malibu and the Marina Del Rey Water System (District), has been identified as the retail water purveyor for the proposed project.

1.2 Purpose

The purpose of this WSA, pursuant to the requirements under SB 610, is to provide and answer to the following question:

> *Will the water supplier's total projected supply for the next 20 years – based on normal, single dry, and multiple dry years – meet the demand projected for the project plus existing and planned future uses, including agricultural and manufacturing uses?*

1.3 Los Angeles County Waterworks District 29, Malibu and the Marina Del Rey Water System

The District was formed in accordance with Division 16 Sections 55000 – 55991 of the State Water Code and is governed by the Los Angeles County Board of Supervisors. Waterworks and Sewer Maintenance Division of the County of Los Angeles Department of Public Works (DPW) provides administration, operation, and maintenance of the District's facilities and infrastructure.

The District is a retail agency under the service area of West Basin Municipal Water District (West Basin MWD) and provides services to the City of Malibu, Pepperdine University, the Marina Del Rey Water System, and the unincorporated Topanga Canyon area.

The 2005 Urban Water Management Plan (2005 UWMP) prepared for the District was adopted by the Board of Supervisors on November 15, 2005, and appropriately filed with the California Department of Water Resources (DWR). A copy of the 2005 UWMP and referenced documents are herein incorporated by reference and are available for review upon request at DPW offices in Alhambra, CA.

1.4 District's 2005 Urban Water Management Plan

Preparation of the 2005 UWMP was a regional planning effort by the District, West Basin MWD, and the Southern California Association of Governments (SCAG). SCAG developed population projections by census tract within the County of Los Angeles service areas. Based on these projections, the District expects the population in its service areas to increase 5 to 12 percent every five years. However, since the census tracts include areas outside of the District that are expected to have greater growth than areas within the District's service area, the 2005 UWMP estimated that its population will increase 2 to 5 percent every five years.

SB 610 provides that if the projected water demand for a proposed project is accounted for in the current urban water management plan adopted by the retail purveyor, then relevant information from that document may be incorporated into the SB 610 WSA (California Water Code Section 10910(c)(2). The

population associated with the land uses for the proposed project was accounted for in the population projections developed by SCAG. Therefore, the projected water demand associated with the proposed project was accounted for in the 2005 UWMP. The timing of the project places it within the timeframe for calculating "planned future uses" within the 2030 water supply projection included in the 2005 UWMP. Accordingly, this document uses relevant information from the 2005 UWMP in order to account for the water demands associated with the project.

1.5 Information Relied Upon in Preparation of this WSA

The following is a list of documentation relied upon to prepare this WSA:

- Department of Water Resources. 2007. Draft State Water Project Delivery Reliability Report, 2007. December.
- Los Angeles County Department of Public Works. 2005. 2005 Urban Water Management Plan, District No. 29 and Marina Del Rey Water System.
- Metropolitan Water District of Southern California. 2005. 2005 Draft Regional Urban Water Management Plan.
- West Basin Municipal Water District. 2005. 2005 Urban Water Management Plan.
- West Basin Municipal Water District. 2007. Water Use Report Fiscal Year 2005 to 2006.

2.0 WATER SUPPLY AND RELIABILITY

The first substantive requirement of the SB 610 WSA is the identification and description of the existing water supply sources in the public water system that will serve the proposed project. Water Code Section 10910(d) requires the WSA to include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system.

The District purchases water supplies from West Basin MWD and has emergency-only interconnections with City of Los Angeles Department of Water and Power and Las Virgenes Municipal Water District.

The following information is taken from the 2005 UWMP except as noted.

Table 2-1 displays the current and projected water supply available to the District from West Basin MWD. Because the District's distribution to the system does not have long term water supply storage, the reliability of the District supply is completely dependent on the availability of water from West Basin MWD.

Table 2-1
Current and Projected Water Supply

Projected Wholesale Water Supply							
	Purchases from wholesaler (Acre-feet per year)						
Water Supply Sources	2000	2005	2010	2015	2020	2025	2030
West Basin MWD	9,450	10,300	11,867	12,803	13,765	14,697	15,557
Recycled Water	140	140	140	140	140	140	140
City of Los Angeles DWP	Emergency Interconnections Only						
Las Virgenes MWD	Emergency Interconnections Only						

Source: Los Angeles County Waterworks District 29, Malibu and the Marina Del Rey Water System 2005 UWMP

2.1 Water Supply

The following information is from the 2005 UWMP. Since the project is accounted for in the 2005 UWMP, the following discussion of water supply would apply to the proposed project.

2.1.1 Imported Water

The project site is located in the Marina Del Rey Water System service area. The Marina system is an extension of the District and accounts for 17 percent of the water demand from West Basin MWD. This smaller system is served directly off the transmission main delivering water to the Malibu system. There are no pump stations or storage tanks within the Marina Del Rey Water System, but it has a connection to one million gallons of storage at the Sunset Mesa tank site in the Malibu area for emergency purposes. The Marina system also has two emergency interconnections with LADWP.

The District receives 100 percent of its water supply from West Basin MWD. West Basin MWD, as a member agency of the Metropolitan Water District of Southern California, relies on imported water from the Colorado River and State Water Project (SWP), to supplement its groundwater supplies and recycled water in the areas within West Basin. West Basin MWD currently relies on 150,000 acre-feet per year of imported water from the Colorado River and the SWP delivered through the Metropolitan Water District to meet the District's retail and replenishment demands. Under a contract with the Federal Government, the Metropolitan Water District has a basic entitlement of 550,000 AFY of Colorado River Water. In addition, the Maximum Annual SWP Table A Amount for the Metropolitan Water District is 1,911,500 AFY. A description of the reliability of supplies to the District is included below.

Litigation Challenges to SWP Operations

Recent litigation has had an effect upon the availability and reliability of imported SWP supplies. For example, in October 2006, plaintiff, Watershed Enforcers, a project of the California Sportfishing Protection Alliance, filed a lawsuit in Alameda County Superior Court alleging that DWR was not in compliance with the CESA and did not have the required state incidental take permit to protect the Delta smelt as part of DWR's pumping operations at the Harvey O. Banks Pumping Plant located near the town of Tracy (Watershed Enforcers, et al. v. California Department of Water Resources, et al. Alameda County Superior Court No. RG06292124 [Watershed decision]). In April 2007, the court agreed with the plaintiff and ordered a shutdown of pumping from the Delta if appropriate permits could not be obtained in 60 days. In May 2007, DWR filed an appeal of the trial court's decision, which automatically stayed the decision pending the outcome of the appeal. At the same time, DWR entered into a Memorandum of Understanding with CDFG to jointly work with the appropriate federal agencies to develop a federal Biological Opinion that complies with CESA. During preparation of the new Biological Opinion, DWR committed itself to actions related to protecting the Delta smelt and other species through adaptive management provisions. Upon completion of this effort, DWR plans to submit a request to CDFG for a consistency determination under CESA that would allow for incidental take based on the new federal Biological Opinion.

In addition, on May 25, 2007, the U.S. District Court for the Eastern District, the Honorable Oliver W. Wanger, presiding, found that the 2005 USFWS Biological Opinion for Delta smelt was not consistent with the requirements of the federal Endangered Species Act and must be rewritten. On August 31, 2007, Judge Wanger established interim operating rules to protect Delta smelt until the USFWS rewrites the Biological Opinion. The interim operating rules set in-Delta flow targets in Old and Middle Rivers from late December through June that will restrict CVP and SWP pumping in 2008 and until the Biological Opinion is rewritten. Judge Wanger's restrictions on CVP/SWP operations will last until September 15, 2008, while the new Biological Opinion for Delta smelt is completed. The new Biological Opinion is expected to impose restrictions that may continue reduced pumping operations in the SWP/CVP until broader solutions are implemented for the Bay-Delta. Other implications are described below based on the best available current information.

In terms of short-term water supply availability, there have been short-term effects related to issues presented in the *Watershed* and Wanger decisions. For example, pumping operations were shut down for approximately nine days in June 2007 due to concerns over the declining number of Delta smelt. DWR then operated the pumps at limited levels for several weeks while waiting for the smelt to migrate to cooler waters. DWR then resumed normal operations in July 2007. There is also concern that the remedy adopted by the District Court could ultimately become part of the conditions in the new Biological

Opinion and incidental take permit expected to be issued in the fall of 2008. These concerns, if they materialize, could limit the percentage of SWP water that can be delivered to SWP Contractors, including Metropolitan Water District.

However, precisely because of these concerns, Governor Schwarzenegger directed DWR to take immediate action to improve conditions in the Delta.[1] According to the Office of the Governor, the Governor is building on his Strategic Growth Plan from last year, which consists of approximately $6 billion to upgrade California's water systems. The Governor's plan invests $4.5 billion to develop additional surface and groundwater storage. The plan also includes $1 billion toward restoration of the Delta, including development of a new conveyance system, $250 million to support restoration projects on the Kalamath, San Joaquin, and Sacramento rivers, and the Salton Sea project, and $200 million for grants to California communities to help conserve water. Using existing resources, DWR will implement numerous actions, including screening Delta agriculture intake pumps to protect smelt, restoring the North Delta's natural habitat, improving the Central Delta water flow patterns, and improving DWR's ability to respond to Delta emergencies, such as levee failures.

The Governor has also directed the Delta Vision Blue Ribbon Task Force to develop a delta management plan. The Task Force has presented its findings and recommendations, and its strategic plan is due by October 31, 2008. The Bay-Delta Conservation Plan is also underway. This plan is intended to ensure compliance with federal and state Endangered Species Act requirements in the Delta. The $1 billion proposed in the Governor's comprehensive plan will be used to fund recommendations from both the Delta Vision Task Force and the Conservation Plan.

Over the long-term, water supply availability and reliability will continue to be assessed by DWR in DWR's biennial SWP delivery reliability reports. These reports necessarily take into account a myriad of factors in evaluating long-term water supply availability and reliability. These factors include multiple sources of water, a range of water demands, timing of water uses, hydrology, available facilities, and regulatory restraints, including pumping constraints due to impacts on listed fish species, water conservation strategies, and future weather patterns. The *Watershed* and *Wanger* decisions highlight the regulatory restraints applicable to SWP supplies, which have impacted DWR deliveries of SWP supplies in the past, and could curtail such deliveries in the future.

DWR has issued its *State Water Project Delivery Reliability Report, 2007*, which is intended "to ultimately assist local agencies, cities, and counties using SWP water in planning integrated water resources management to allow them to develop adequate and affordable water supplies for their communities."

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1 For the Governor's release issued July 17, 2007, please refer to http://gov.ca.gov/ index.php?/print-version/press-release/6972/, which is included in Appendix 4.3 of the Final EIR.

(2007 Draft Reliability Report, p. 2.) The 2007 Draft Reliability Report assesses the current state of water reliability, which depends on "the availability of water at the source, the ability to convey water from the source to the desired point of delivery, and the magnitude of demand for the water." (Id. at p. 6.) In comparison to the *State Water Project Delivery Reliability Report, 2005*, the total annual SWP deliveries is expected to decrease for normal, single-dry, and multiple-dry water years.

2.1.2 Recycled Water

The District is within the service area of West Basin MWD's Recycled Water Program. Under this program, West Basin MWD produces recycled water for 13 southern California cities in its service area. Although the program does not service the District with recycled water because of its location, it does provide an indirect benefit. The Recycled Program reduces demand on potable water by other water districts and ensures a strong reliable source for the District. According to West Basin MWD's 2005 Urban Water Management Plan, West Basin expects to increase recycled water production from 14,000 AF/year to nearly 43,750 AF/year by year 2030.

A description of imported water to the Malibu and Topanga areas, also served by the District, is located in Section 2.1 of the 2005 UWMP. Section 2.2, Recycled Water, in the 2005 UWMP includes a description of the publicly-owned wastewater treatment plants that produce and use recycled water, including the West Basin MWD Recycled Water Program. These wastewater treatment plants, in addition to other water recycling programs, are located in the Malibu and Topanga areas and in the West Basin MWD service area outside of the District boundaries.

2.1.3 Groundwater

The geology below the District's service area lacks groundwater basins capable of producing an adequate supply of groundwater. Therefore, no supply from ground water sources will be used for future water supply within the District.

2.2 Water Reliability

The following information is from the 2005 UWMP, unless otherwise noted. Since the project is accounted for in the 2005 UWMP, the following discussion of water reliability would apply to the proposed project.

2.2.1 Reliability

Reliability is a measure of a water system's expected success in managing water shortages. Reliability planning requires information about the following: (1) expected frequency and severity of shortages; (2)

how additional water management is likely to effect the frequency and severity of shortages; and (3) how available contingency measures can reduce the impact of shortages when they occur.

2.2.2 Frequency and Magnitude of Supply Deficiencies

The District experienced a drought between 1987 and 1991. During this period, supply in southern California decreased and MWD called for water use reductions throughout its service area. To meet these reductions, the County of Los Angeles adopted three ordinances in 1991 that included measures to limit wastewater, reduce water use through a conservation surcharge, and through amending the plumbing code to require low flow toilets and urinals. These ordinances are described in further detail in Section 4.2 of the 2005 UWMP.

2.2.3 Reliability Comparison

Table 2-2 shows the anticipated water demand in the District's service area for an average or "normal" water year, a single dry water year, and multiple dry water years. The Normal Water Year Demand is based on data from 2000 to 01 which was a year of normal rainfall. According to the National Weather Service, the recorded rainfall in 2000 to 01 was 17.94 inches. This was one of the closest years to the historical 100 year averages (16.42 inches). The Single Dry Year demand is based on the lowest rainfall year of 2001 to 02. The recorded rainfall in 2001 to 02 was 4.42 inches – the lowest recorded year in over 100 years. The three Multiple Dry-Water Year demands are based on the most recent multiple dry year period of 2001 to 2004.

Table 2-2
Supply Reliability in Acre-Feet per Year

			Multiple Dry-Water Years		
Supplies	Normal Water Year	Single Dry Water Year	Year 1	Year 2	Year 3
Imported Water	9,360	10,418	10,418	10,303	10,690

Source: Los Angeles County Waterworks District 29, Malibu and the Marina Del Rey Water System 2005 UWMP

The primary reason for an increase in water demand during single dry and multiple dry years is the increased landscape irrigation that occurs to compensate for reduced rainfall.

2.2.4 Plans to Assure a Reliable Water Supply

The District purchases all of its water supply from West Basin MWD. While emergency connections do exist with Las Virgenes MWD and LADWP, they do not supply an adequate or reliable source. Therefore, a reliable water supply is completely dependent on the availability of water from the District's wholesaler, West Basin MWD.

In order to meet the challenges of supply shortages on these sources, the Metropolitan Water District designed an Integrated Resource Plan (IRP) to decrease the region's reliance on Colorado River and SWP supplies. According to West Basin MWD's 2005 Urban Water Management Plan, as part of the IRP, West Basin MWD and Metropolitan Water District have taken important steps such as wastewater recycling and groundwater recharge to reduce the vulnerability of supplies to extended droughts or other potential threats to reliability. The West Basin MWD Reliability Plan and the Metropolitan Water District's Water Surplus and Drought Management Plan are described in further detail under Section 4.4 in the 2005 UWMP. Based on information from the *Draft State Water Project Delivery Reliability Report, 2007,* Metropolitan Water District has determined that there are sufficient water supplies available for pending and future development within the West Basin MWD's service area for the foreseeable future through 2030 as set forth in the 2005 UWMP.

Table 4-2 depicts the wholesale supply reliability for West Basin MWD for a Normal Water Year, Single Dry-Water Year, and Multiple Dry-Water Years, as defined above. West Basin MWD relies on groundwater for 20 percent of its retail demand. However, the District does not have any adjudicated pumping rights in West Basin, and therefore relies solely on the imported supplies.

Table 4-2
Supply Reliability West Basin MWD (Acre-feet)

Supplies	Normal Water Year	Single Dry-Water Year	Multiple Dry-Years		
			Year 1	Year 2	Year 3
Imported Water	126,000	129,936	129,936	130,940	135,334
Groundwater[1]	56,797	56,797	56,797	56,797	56,797
Recycled Water[2]	14,000	14,000	14,000	14,000	14,000
Total Supply	196,797	200,733	200,733	201,737	206,131

Source: West Basin Municipal Water District; 2005 UWMP

[1] *Based on the total water rights for each customer agency within West Basin's service area, according to the 2004 DWR West Coast Basin Watermaster Report. Also includes groundwater rights (2,000 AFY) from the Central Coast Groundwater Basin, which are imported in West Basin*

[2] *Includes Recycled Water sales from Best Basin's service area; does not include recycled water sales to LADWP or replenishment sales.*

3.0 WATER USE

3.1 Past, Current and Projected Water Use

The following information is from the 2005 UWMP, unless otherwise noted. Since the project is accounted for in the 2005 UWMP, the project is included in the following water use projections. **Table 3-**1 depicts past, current, and projected water use for each water use sector in the District. Based on SCAG projections, water use within the District will increase 45 percent over the next 25 years. **Table 3-2** depicts past, current and projected service connections by customer type within the District. As shown in the table, connections are expected to increase by approximately 46 percent by the year 2030.

Table 3-1
Past, Current and Projected Water Use (Acre-Feet)

Connection Type	2000	2001	2004	FY '04–'05	2010	2015	2020	2025	2030
Single Family Residential	-	6,381	7,293	6,827	7,569	8,195	8,811	9,407	9,958
Multi-Family Residential	-	681	667	667	742	800	860	919	972
Commercial	-	443	443	445	495	534	574	613	649
Private Fire Protection	-	20	25	27	30	32	34	37	39
Landscape/Irrigation	-	294	338	306	341	368	395	422	447
Other[1]	-	592	954	963	1071	1156	1243	1327	1404
Water Sold	8,228	8,411	9,719	9,235	10,274	11,085	11,918	12,724	13,469
Water Purchased	9,450	9,733	10,715	9,941	11,302	12,194	13,110	13,997	14,816

Source: County Waterworks Division; Los Angeles County Waterworks District 29, Malibu and the Marina Del Rey Water System 2005 UWMP

[1] *Landscape/Irrigation includes potable and recycled water*

[2] *Other Connections includes: Private Fire Protection, Temporary Construction, Public/Government Agencies, Combined Domestic and Private and Other Sectors*

[3] *10 percent water loss is assumed for projections of Wholesale Water use due to the condition of the District's Distribution System*

Table 3-2
Number of Connections by Customer Type

Connection Type	2000	2005	2010	2015	2020	2025	2030
Single Family Residential	6,793	7,080	7,899	8,512	9,152	9,771	10,343
Multi-Family Residential	86	91	101	109	118	126	133
Commercial	123	116	129	140	150	160	170
Private Fire Protection	79	111	124	133	143	153	162
Landscape / Irrigation	108	109	121	131	141	150	159
Other[1]	142	107	119	129	138	148	156
Total No. of Meters	7,331	7,614	8,484	9,154	9,842	10,508	11,123

Source: County Waterworks Division; Los Angeles County Waterworks District 29, Malibu and the Marina Del Rey Water System 2005 UWMP

[1] *Other Connections includes: Private Fire Protection, Temporary Construction, Public/Government Agencies, Combined Domestic and Private and Other*

3.2 *Water Use of Project*

In 2005, the District's demands were approximately 9,600 acre-feet. The existing residences on the project site currently use 18 acre-feet per year (afy). The proposed project will require approximately 120 afy at buildout, for a net increase requirement of 102 afy.

Table 3-3
Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project Water Demand

Land Use	Units	Demand Factor[1] (gal./day/unit)	Daily Demand (gal./day)	Annual Demand (acre-feet/year)
Proposed Residential	526 du	120	63,120	71
Woodfin Suite Hotel Project	152 hotel units	130	19,760	22
	68 One-bedroom Timeshare Unit	120	8,160	9
	68 Two-bedroom Timeshare Unit	160	10,880	12
	Restaurant		5,400	6
Subtotal			**107,320**	**120**
Less Existing Residential	-136 du	120	-16,320	-18
Net Project Total:	**390 du**		**91,000**	**102**

Source: Impact Sciences, Inc., March 2005.
Note: Numbers may not total exactly due to rounding.
du = dwelling unit.

[1] *The water consumption rate is from the Marina del Rey Apartment Community Draft EIR, Impact Sciences, May 2000.*

4.0 NORMAL, SINGLE-DRY, AND MULTIPLE-DRY YEAR PLANNING

The following is a summary of the existing and planned supplies and how they will be utilized during Normal, Single-Dry and Multiple Dry Years. Historic data from West MWD and Metropolitan Water District were used to determine the projected single and multiple dry water year water demands. Since the project is accounted for in the 2005 UWMP, the following discussion of water supply would apply to the proposed project.

4.1 Normal Water Year

Since the District receives 100 percent of its water supply from West Basin MWD, it is therefore necessary to analyze the reliability of the West Basin MWD water supply. Available supply from the West Basin MWD must be greater than or equal to the projected water demands for the District in order for the District's supply to be reliable for its customers.

Table 4-1 displays a sufficient supply to meet water supply demands of the District. West Basin MWD's Urban Water Management Plan projects a 100 percent reliable supply of water for all retail agencies served by West Basin MWD for the next 25 years. This assumption is assured through Metropolitan Water District's WSDM Plan and the Diamond Valley Reservoir. The proposed project would utilize 102 afy at buildout. This is within the total normal year supplies for the District, shown in **Table 4-1** below.

Table 4-1
Projected Average/Normal Year Supplies and Demands

Connection Type	2005	2010	2015	2020	2025	2030
Total Supply from West Basin MWD (acre-feet)	10,300	11,867	12,803	13,765	14,697	15,557
Total Demand for the District[1] (acre-feet)	9,941	11,302	12,194	13,110	13,997	14,816
Difference (Surplus)	**359**	**565**	**610**	**655**	**700**	**741**

Source: County Waterworks Division; Los Angeles County Waterworks District 29, Malibu and the Marina Del Rey Water System 2005 UWMP

[1] *These values do not include recycled water.*

4.2 Current, Single and Multiple Dry Water Year Demands

Table 4-2 presents a comparison of the projected water supply to the potential single and multiple dry water year demands. The projected single and multiple dry water year demands were determined from historic data analyzed by West MWD and Metropolitan Water District that shows a 4 to 8 percent increase in water demands in their service areas during drought years. The proposed project would

utilize 102 afy at buildout. This is within the total demand projected for normal, single-dry year and multiple dry-year demands for the Districts shown below.

In the event of consecutive dry years and reductions in the available water from West Basin MWD, the County of Los Angeles Board of Supervisors has adopted a water shortage contingency plan known as the *Phased Water Conservation Plan* (PWCP). The purpose of the PWCP is to reduce overall water demands throughout the District in the event of limited water supplies. Under the PWCP, reductions are made in phases to reduce water uses in percentages.

As described in Section 7.0 of the UWMP, the PWCP imposes phases of mandatory water reductions in water use of up to 50 percent throughout the District. Implementation of the PWCP involves setting conservation targets in phases to reduce water usage and financially discouraging wasteful or unreasonable water use and encouraging water conservation. It is through implementation of the PWCP that the District will meet water demands during times of drought or when sources of water are otherwise constrained.

As of April 11, 1996, the District is a signatory to the Memorandum of Understanding regarding the California Urban Water Conservation Council, and according to the Urban Water Management Plan Act, may submit an annual report identifying water demand management measures, also known as best management practices (BMPs), currently being implemented, or scheduled for implementation, to satisfy the requirements of Section 1063.1.f. of the UWMPS.

Table 4-2
Current, Single, and Multiple Dry Water Year Demands

Projected Normal Water Year Supply	Projected Single Dry Water Year Demand	Multiple Dry-Year Demands		
		Year 1	Year 2	Year 3
Fiscal Year 00–01	***Fiscal Year 01–02***	***FY 01–02***	***FY 02–03***	***FY 03–04***
9,931 afy	10,418 afy	10,418 afy	10,303 afy	10,690 afy
2005	***2006***	***2006***	***2008***	***2009***
10,440 afy	10,962 afy	10,962 afy	10,858 afy	11,275 afy
2010	***2011***	***2011***	***2012***	***2013***
11,302 afy	11,867 afy	11,867 afy	11,754 afy	12,206 afy
2015	***2016***	***2016***	***2017***	***2018***
12,194 afy	12,803 afy	12,803 afy	12,681 afy	13,169 afy
2020	***2021***	***2021***	***2022***	***2023***
13,110 afy	13,765 afy	13,765 afy	13,634 afy	14,159 afy
2025	***2026***	***2026***	***2027***	***2028***
13,997 afy	14,697 afy	14,697 afy	14,557 afy	15,117 afy
Percent of Normal	**105%**	**105%**	**104%**	**108%**

Source: County Waterworks Division; 2005 UWMP

5.0 CONCLUSION

Based on this analysis set forth within this WSA, the District's total projected water supplies available during the next twenty years will meet the projected water demands associated with the Neptune Marina Apartments and Anchorage/Woodfin Suite Hotel and Timeshare Resort Project, in addition to existing and other planned uses within the District's service area. This determination is consistent with the findings provided with the District's 2005 UWMP.

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
Waterworks District 29 and
Marina Del Rey Water System

2005
URBAN WATER MANAGEMENT PLAN

December 2005

Prepared For:

County of Los Angeles
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Water Resources Unit

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
WATERWORKS DISTRICT 29 AND THE MARINA DEL REY WATER SYSTEM
2005 URBAN WATER MANAGEMENT PLAN

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1.0 INTRODUCTION

The 2005 Urban Water Management Plan (UWMP) for Los Angeles County Waterworks District 29, Malibu and the Marina Del Rey Water System (District) was prepared in accordance with the California Urban Water Management Planning Act of 1984. (Appendix A presents a copy of the Act and its provisions). The Act has been amended several times since its passage, with the most recent amendment in 2004. The Act requires every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000/AF (acre-feet) of water annually to prepare and adopt, in accordance with prescribed requirements, an Urban Water Management Plan. Pursuant to section 10621.a. of the Act, each urban water supplier shall update its plan at least once every five years on or before December 31, in calendar years ending in five and zero.

1.1 Formation of Waterworks District 29 and Marina Del Rey Water System

The District was formed in accordance with Division 16 Sections 55000-55991 of the State Water Code. The District is governed by the Los Angeles County Board of Supervisors with the Waterworks and Sewer Maintenance Division of the County of Los Angeles Department of Public Works (DPW) providing administration, operation, and maintenance of the District's facilities and infrastructure.

1.2 Public Participation

The 2005 UWMP was adopted by the Board of Supervisors on **November 15, 2005** and submitted to the California Department of Water Resources within 30 days of the Boards adoption. A public hearing was held during the meeting to include public review and comments on the 2005 UWMP. Notice of the preparation of the plan and the public hearing was made in_____ and a copy of the plan was distributed to interested parties and placed in the local libraries throughout the District.

1.3 Coordination within the County

DPW staff of the Waterworks and Sewer Maintenance Division have coordinated with the County of Los Angeles Department of Regional Planning to develop the population projections for this plan.

1.4 Interagency Coordination

The District is a retail agency under the service area of West Basin Municipal Water District (West Basin MWD). Coordination with West Basin MWD's staff to project the supply reliability and coordinate various water conservation programs has assured consistency between the two agency plans. The District also worked with the Southern California Association of Governments (SCAG) to determine population growth in the service areas.

1.5 Purpose of the Urban Water Management Plan

The purpose of Urban Water Management Plans is to help water agencies plan for future water supply and demand within their service areas. Water in the State of California is a limited resource. The District recognizes that conservation and efficient use of water are critical, and has prepared this UWMP to ensure an appropriate level of reliability in its water service to meet the needs of its customers during normal, dry and multiple dry years.

1.6 Climate

The District's service areas lie along the Pacific Coast. The climate is Mediterranean, characterized by warm, dry summers and wet, cool winters with average precipitation of 13 inches per year. The steady climate and low rainfall makes the area a popular vacation location for tourists. In Table 1.1 the average monthly temperature, rainfall and evapo-transportation rates (ETo) are displayed. The temperature and precipitation data was collected via the Western Regional Climate Center's website at the Los Angeles WSO Airport weather station. The period of record for the temperature and precipitation is from the year 1914 to 2005. The ETo data was obtained from the California Irrigation Management Information System (CIMIS) at the Santa Monica station for the Los Angeles Region.

Table 1.1 Temperature, Precipitation, and ETo

	Jan	Feb	Mar	Apr	May	Jun
Average Max. Temperature (F)	65.1	65.6	66.4	68.2	70.1	73.3
Average Min. Temperature (F)	47.9	49.1	50.6	52.8	55.9	59
Average Total Precipitation (in.)	2.9	3.15	2.08	0.91	0.21	0.06
Average ETo	1.79	2.12	3.3	4.49	4.73	5.03

	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	77.2	78.3	77.5	74.6	71.4	66.5	71.2
Average Min. Temperature (F)	62.3	63.2	61.9	58.2	52.9	48.7	55.2
Average Total Precipitation (in.)	0.01	0.06	0.22	0.43	1.22	2.21	13.47
Average ETo	5.4	5.38	3.94	3.4	2.42	2.22	3.69

[1] Data taken from the Western Regional Climate Center's website at the Los Angeles WSO Airport Station: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?calosa.
[2] ETo data taken from the California Irrigation Management Information System (CIMIS) at the Santa Monica Station for Calendar Year 2004: http://www.cimis.water.ca.gov/cimis/welcome.jsp.

1.7 Other Demographic Factors

The District provides water service to the City of Malibu, Pepperdine University, Marina Del Rey Water System, and the unincorporated Topanga Canyon area. The District's service area includes an estimated population of 24,973 served through approximately 7,761 active meters. The majority of these connections serve residential communities with some services to commercial, landscape, fire protection, and other public agencies.

Malibu area

The Malibu water service area is a narrow strip along the coastline, with numerous canyons running northwards. As shown on the following two pages it is bounded on the north by the steep and rugged Santa Monica Mountains, on the east by Topanga Canyon, on the west by Ventura County and on the south by the Pacific Ocean. The District occupies an area of about 47.50 square miles (30,400 acres). Incorporation of the City of Malibu occurred in 1991, and the District has been supplying water to customers in Malibu area since 1973. The major projects that were constructed during the previous five years have been provided in the following paragraphs.

Due to a growing population, natural disasters and outdated water systems in the Malibu area, improvement projects have been integrated in the development of the City to increase water service reliability. Between Rock Drive and Tuna Canyon Rd. along Pacific Coast Highway, a known landslide area, a bypass system was installed consisting of three 10-inch diameter pipelines to temporarily replace a 30-inch pipeline in emergencies. After the 1993 fire in Malibu the 200,000 gallon reinforced concrete La Costa water tank was heavily damaged. The County replaced the damaged tank with a larger 400,000 gallon welded steel water storage tank located across from the old site.

To meet increasing water demands, the Topanga Fernwood water mainline was upgraded. It was replaced with approximately 450 feet of 12-inch water main. A new pump house was constructed. The pump house and water main were designed to pump water directly to the Topanga Forks and Topanga Beach Tanks for storage. The new pump station houses six new vertical turbine pumps. Four existing pumps are to be phased out once all six pumps at the new pump station are operational. Another similar project was completed at Sumacridge reservoir. A 300,000 gallon tank was constructed along with a new pump station with three new pumps and appurtenances at the Sumacridge reservoir site. The District also replaced a 4,000-ft water main in Encinal Canyon to meet water demand in that area.

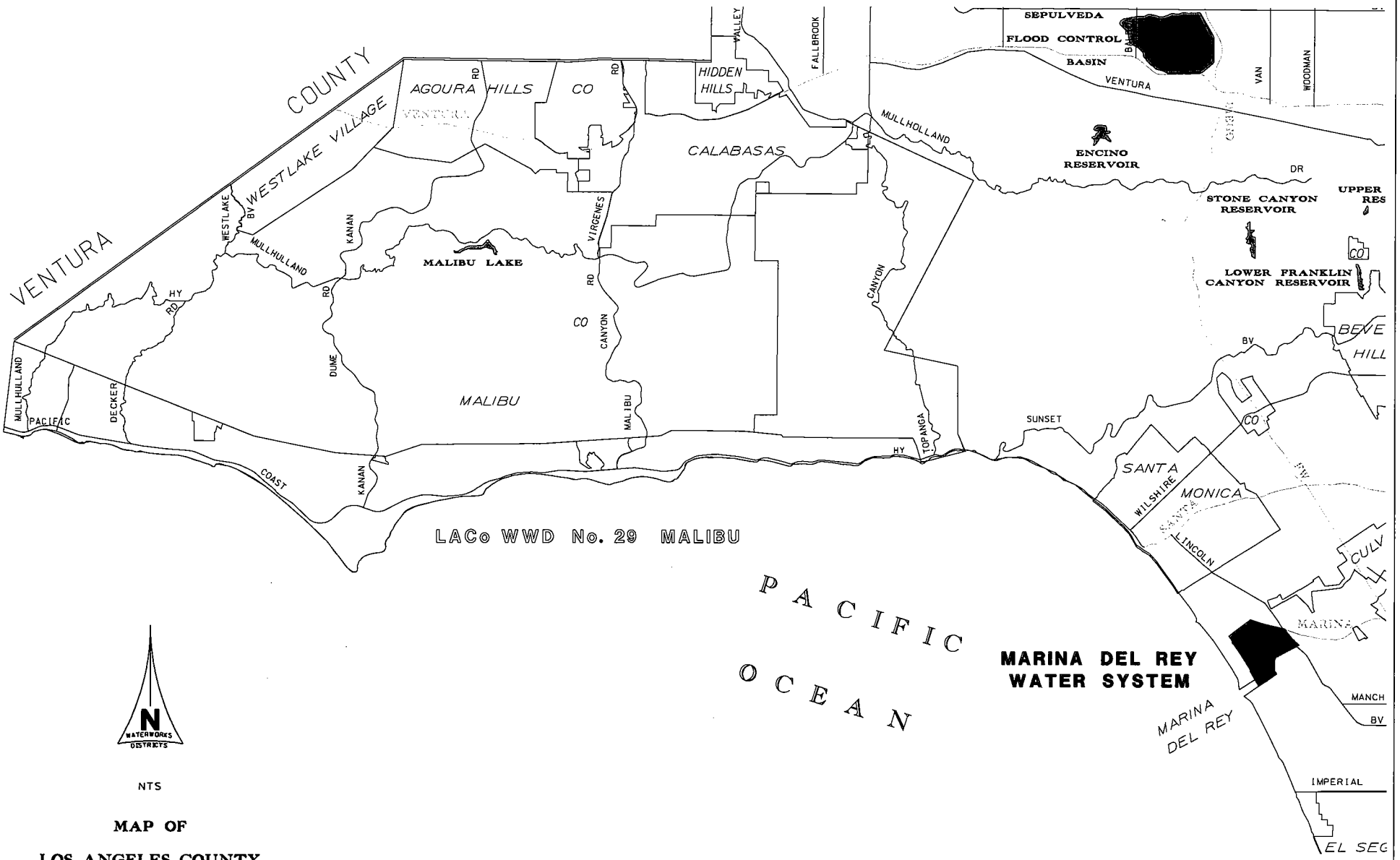
Marina Del Rey area

The Marina Del Rey Water System (Marina Del Rey) is a smaller system served directly off the transmission main delivering water to the Malibu System. As shown in Figure 1-1, at the end of Section 1.7, Marina Del Rey's service area encircles the Marina Del Rey Harbor, providing service to businesses, as well as apartment and condominium complexes in the Marina Del Rey area through 300 service connections.

An Adequacy Study for Marina Del Rey, conducted by the County of Los Angeles Department of Beaches and Harbors, found the existing water system facilities were designed and constructed in 1961/62 to accommodate low density, two story structure land use. Subsequently, the land use has changed to high density, high rise structures, and the existing water system has not been upgraded to meet the increased demands.

Twelve million dollars of system improvements for the Marina Del Rey area have been recommended to support existing and future growth. These water system improvements were broken into five phases and scheduled for construction over a 13-year period from 1997 to 2010. They include replacement of transmission mains, metering stations, upgrades, and the construction of a 3.6 million-gallon reservoir storage tank. Phases I and IA have were completed over the last five years. Phase II is scheduled to be constructed before 2010 and Phase IV has been eliminated due to changes in the system design. The remaining phases of construction will be completed as funds in the District's Accumulative Capital Outlay Fund become available.

FIGURE 1-1



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MAP OF

LOS ANGELES COUNTY WATERWORKS DISTRICTS

1.8 Population

The Southern California Association of Governments (SCAG) has developed population projections by census tract within the County of Los Angeles. Based on these projections, the population within the census tracts containing the District is estimated to increase 5 to 12 percent every five years. However, these census tracts include areas outside of the District that are expected to have greater growth than the areas within the service area of the District. For this report it is estimated that population will increase by 2 to 5 percent every five years. This estimate is consistent with the past growth in water demand over the last several years.

Table 1.2 below displays the population growth projections over the various regions in the District from the year 2000. Projections have been shown through 2030. This table provides two projection estimates; one is based on SCAG projections and the other is based on the observed growth in the number of new connections per year.

Table 1.2 Population Projections

Southern California Association of Gov't (SCAG) Based Projections							
	2000	2005	2010	2015	2020	2025	2030
City of Malibu	12,656	13,471	13,721	14,546	15,370	16,196	17,000
Northern Topanga	3,276	3,548	4,714	5,294	5,925	6,453	6,896
Southern Topanga	3,207	3,623	4,283	4,770	5,293	5,772	6,185
Marina Del Rey	8,334	10,143	11,587	12,402	13,205	14,065	14,891
Dist. 29 (Exclude Marina del Rey)	19,139	20,642	22,718	24,610	26,588	28,421	30,081
Total District 29 Population	27,473	30,785	34,305	37,012	39,793	42,486	44,972
Percent (%) Growth over 5 Year Period	12%	11%	8%	8%	7%	6%	5%
Population Estimates Based on the anticipated number of New Connections Multiplied by Average Person Per Household (APPH)							
	2000	2005	2010	2015	2020	2025	2030
Number of Connections	7,331	7,614	7,842	8,078	8,320	8,570	8,827
Projected Population	24,430	29,918	31,977	33,430	34,886	36,421	37,941
Percent (%) Growth over 5 Year Period	22%	7%	5%	4%	4%	4%	4%

1.9 Past Drought, Water Demand, and Conservation Information

The District experienced a drought from 1989 to 1992 and the County of Los Angeles took several efforts to reduce water usage and promote water conservation. One effort

was the "Phased Water Conservation Plan," where the County Supervisors adopted a nine stage (phased) approach to reduce water usage. The Plan set up nine conservation targets for the District to meet the anticipated shortage in water supply. (See Appendix B for LA County Ordinance No. 91-0075M)

In addition, there was a voluntary conservation effort in 1990 requested by Metropolitan Water District of Southern California (MWD) for the District to reduce its water consumption by 10 percent. During the four-month duration of the request (June through September of 1990), the District reduced its monthly water consumption by 12 percent. The District's wholesaler, West Basin MWD, reported that during the four-month conservation effort the District saved more than 273 acre-feet (AF) of water.

The District has a water supply composed entirely of imported water. On April 11, 1996, the District became signatory to the Urban Water Conservation Council's (CUWCC) Memorandum of Understandings (MOU) in order to increase the District's commitment to implement water conservation and prepare the service area for potential water shortages in the future.

2.0 WATER SUPPLY

The District receives all of its water supply from imported sources. The District purchases the majority of its water from West Basin MWD, and the remainder through emergency interconnections with the City of Los Angeles Department of Water and Power and Las Virgenes Municipal Water District.

Table 2-1 displays the current and projected water supply available to the District from West Basin MWD. Because the District's distribution system does not have long term water supply storage, the reliability of the District supply is completely dependent on the availability of water from West Basin MWD.

Table 2.1 Current and Projected Water Supply

Projected Wholesale Water Supply							
Purchases from wholesaler (Acre-feet per year)							
Water Supply Sources	2000	2005	2010	2015	2020	2025	2030
West Basin MWD	9,450	10,300	11,867	12,803	13,765	14,697	15,557
City of Los Angeles DWP	Emergency Interconnections Only						
Las Virgenes MWD	Emergency Interconnections Only						
Recycled Water	140	140	140	140	140	140	140
Total	9,590	10,440	12,607	13,590	14,601	15,579	16,481

2.1 Imported Water

Malibu & Topanga areas

West Basin MWD receives the water supply for the District from the Metropolitan Water District of Southern California (MWD). The water the District purchases from West Basin MWD is delivered from the District's interconnection with West Basin MWD in the City of Los Angeles to the District's easterly boundary through a 15-mile, 30-inch high-pressure transmission main. Because of the topography of the District, the water is then delivered 20 miles through a transmission main in Pacific Coast Highway (PCH) to the westerly boundary of the District. The water is pumped into the District's storage tanks to provide service to Topanga Canyon and the other canyon areas located along PCH.

The District has four emergency interconnections; two with the City of Los Angeles Department of Water and Power (LADWP) and two with the Las Virgenes Municipal Water District. Major system facilities include approximately 200 miles of water main of which approximately 5 percent (53,600 linear feet or 10.2 miles) are above ground. The major system also includes 32 pump stations and 52 storage tanks with approximately 20 million gallons of storage capacity.

Currently, the Malibu system has approximately one day of storage during periods of peak demand. Water received from the West Basin MWD is distributed via the 30-inch main through the 32 pump stations to 35 pressure zones. The water system is comprised of District constructed facilities built mostly in the 1960's, as well as facilities constructed by various small mutual water companies and neighborhood homeowners dating back to the 1930's and 1940's. Therefore, the overall water system is an amalgamation of old small systems joined to create the Malibu system. In this unique system, the combination of old facilities and difficult terrain causes maintenance and operation costs to be higher than other water districts.

In 1998, the District conducted an updated review of system deficiencies. Preliminarily recommending capital improvements of $108.5 million to upgrade the Malibu water system with storage and fire flow improvements being the main focus. However, repetitive failures in the aging system require funds to be targeted for immediate repairs without much progress on needed capital improvements.

Marina Del Rey

The Marina system is an extension of the District and accounts for 17 percent of the water demand from West Basin MWD. This smaller system is served directly off the transmission main delivering water to the Malibu system. There are no pump stations or storage tanks within the Marina water system, but it has a connection to one million gallons of storage at the Sunset Mesa tank site in the Malibu area for emergency purposes. The Marina system also has two emergency interconnections with LADWP.

2.2 Recycled Water

Production and use of recycled water is limited in the District because the community served is predominately on individual septic systems. A portion of the wastewater generated in the area is collected and treated by small private and publicly owned package wastewater treatment plants serving individual developments. DPW operates and maintains the collection and treatment systems of three publicly-owned treatment plants (Malibu Mesa Water Reclamation Plant, Malibu Water Pollution Control Plant and Trancas Water Pollution Control Plant) serving the area. The total treatment capacity of these publicly owned facilities is approximately 312,500 gallons per day (gpd). Of these plants, only the Malibu Mesa Plant generates recycled water for irrigation use.

The Malibu Mesa Plant serves an estimated population of 3,360 persons at Pepperdine University, in the unincorporated area, and the Malibu Country Estates, a residential subdivision in the City of Malibu. The wastewater from the plant is recycled to Title 22 standards for landscape irrigation. The facility provides preliminary, secondary and tertiary treatment, with disinfection by an ultraviolet system. Tertiary treatment is provided by coagulation, rapid mix, flocculation and sand filtration. The recycled water is then used by Pepperdine University for landscape irrigation of approximately 113 acres on the campus and approximately 1.6 acres on the plant site. Recycled water generation and use has varied over the past 5 years, due to variation in the volume of

wastewater produced and the demand for irrigation based on soil moisture content and climatic factors. In 2004, 100 percent of the effluent produced, approximately 45.5 million gallons (140 acre-feet) of wastewater treated at the Malibu Mesa Plant, was used for landscape irrigation. DPW does not expect the use of recycled water to increase in the future because significant growth is not projected for the plant's service area.

The District is within the service area of West Basin MWD's Recycled Water Program. Under this program, West Basin MWD produces recycled water for 13 Southern California cities in its service area. Although the program does not service the District with recycled water because of its location, it does provide an indirect benefit. The Recycled Program reduces demand on potable water by other water districts and ensures a strong reliable source for the District. According to West Basin MWD's 2005 Urban Water Management Plan, West Basin expects to increase recycled water production from 14,000 AF/year to nearly 43,750 AF/year by the year 2030.

2.3 Groundwater

The geology below the District's service area lacks groundwater basins capable of producing an adequate supply of groundwater. Therefore no supply from ground water sources will be used for future water supply within the District.

3.0 WATER USE

3.1 Past, Current and Projected Water Use

Table 3.1 displays the past, current and projected water use for each water use sector in the District. Based on SCAG projections, water use within the District will increase 45% over the next 25 years. This can be explained by overall build up within the District.

Table 3.1 Past, Current, and Projected Water Use (Acre-Feet)

Water Use Sectors	2000	2001	2004	FY '04-'05	2010	2015	2020	2025	2030
Single Family Residential	-	6,381	7,293	6,827	7,596	8,195	8,811	9,407	9,958
Multi-Family Residential	-	681	667	667	742	800	860	919	972
Commercial	-	443	443	445	495	534	574	613	649
Private Fire Protection	-	20	25	27	30	32	34	37	39
Landscape / Irrigation	-	294	338	306	341	368	395	422	447
Other	-	592	954	963	1,071	1,156	1,243	1,327	1,404
Water Sold	8,228	8,411	9,719	9,235	10,274	11,085	11,918	12,724	13,469
Water Purchased	9,450	9,733	10,715	9,941	11,302	12,194	13,110	13,997	14,816

(1) Landscape/Irrigation includes potable and recycled water
(2) Includes: Private Fire Protection, Temporary Construction, Combined Domestic & Private, Gov't/Public Agencies, and Other Sectors
(3) 10% water loss is assumed for projections of Wholesale Water use due to the condition of the District's Distribution System

The District began tracking water use by customer type in 2001. Previously, water use data was only available for the District as a whole. Projected water use through 2030 was estimated using the observed water use per person based on the District's historic billing records and the population projections made by SCAG. Current water use in the District was estimated at 97,600 gallons/year/person (0.2995 acre-feet/year/person) using data from 2000-2005.

Table 3.2 below displays the actual and projected number of connections by customer type for years 2000 to 2030. Based on these numbers, connections are estimated to increase by approximately 46 percent by the year 2030.

Table 3.2 Number of Connections by Customer Type

Connection Type	2000	2005	2010	2015	2020	2025	2030
Single Family Residential	6,793	7,080	7,889	8,512	9,152	9,771	10,343
Multi-Family Residential	86	91	101	109	118	126	133
Commercial	123	116	129	140	150	160	170
Private Fire Protection	79	111	124	133	143	153	162
Landscape / Irrigation	108	109	121	131	141	150	159
Other	142	107	119	129	138	148	156
Total No. of Meters	7,331	7,614	8,484	9,154	9,842	10,508	11,123

(1) Other Connections includes: Private Fire Protection, Temporary Construction, Public/Gov't Agencies, Combined Domestic & Private, and Other
Source: County Waterworks Division

3.2 Residential Sector

Single Family and Multi-Family Residential Customers account for the majority of water use within the District. For the City of Malibu, the average persons per household is 2.7 based on SCAG estimates from 2000.

Residential customer connections have increased 4 percent since 2000. Over the next 25 years, development in the residential sector will consist of infill growth and conversion of commercial facilities into multi-family residential units.

3.3 Commercial/Institutional Sector

The District's service area includes a commercial sector ranging from markets and restaurants to shopping centers. The commercial sector is predominately within the Marina Del Rey water system service area and along the coastline in the City of Malibu, due to the high tourist activity along the Pacific Coast Highway. The commercial connections are expected to have minimal growth over the next twenty years due to the built out commercial sector of the District.

The service area has a stable institutional sector within the District, which includes government buildings within the City of Malibu, schools, public facilities, and public hospitals. Growth in this sector is also expected to be minimal for the next 25 years.

3.4 Landscape/Irrigation Sector

Landscape irrigation includes golf courses, residential lawns, parks, and schools. All landscape irrigation uses potable water except for landscape within Pepperdine University. All irrigation water use in Pepperdine is recycled water from the Malibu Mesa Reclamation Plant. Growth in this sector is expected to be minimal for the next 25 years.

3.5 Other

The remainder of the water use in the District is for private fire protection, construction, and public/government facilities. Growth in this sector is expected to be minimal for the next 25 years.

4.0 WATER RELIABILITY

4.1 Reliability

Reliability is a measure of a water system's expected success in managing water shortages. Reliability planning requires information about the following: (1) expected frequency and severity of shortages; (2) how additional water management is likely to effect the frequency and severity of shortages; and (3) how available contingency measures can reduce the impact of shortages when they occur.

4.2 Frequency and Magnitude of Supply Deficiencies

The District experienced a drought between 1987 and 1991. During this period, supply in Southern California decreased and MWD called for water use reductions throughout it's service area. To meet these reductions, the County of Los Angeles adopted three ordinances in 1991.

The first was Ordinance No. 91-0046U, which called for a water waste prohibition for the unincorporated areas of the County. The water saving measures included limiting car washes, preventing excessive landscape watering, and prohibiting washing paved surfaces. Any failures to comply with these provision resulted in a fine.

The second and most significant measure adopted was Ordinance No. 91-0075M, which created the Phased Water Conservation Plan. Through nine phases, the Board of Supervisor can declare mandatory percentages of water use reductions in order to stretch water supplies. In 1991, the Board of Supervisors declared a "Phase Three" shortage with a goal to reduce water consumption in the District by 20 percent. Any customers that exceeded this target quantity were assessed a conservation surcharge on their bill.

On June 27, 1991, the County adopted Ordinance No. 91-0097U, which amended the plumbing code by requiring the installation of ultra low flow toilet and urinals in all new buildings.

All these measures, including efforts by the community to conserve water, resulted in a 21 percent reduction in the Malibu area and a 15 percent reduction in the Marina Del Rey area, between May 1991 and April 1992. This effort created an estimated combined savings of approximately 1,800 acre-feet of potable water.

4.3 Reliability Comparison

Table 4-1 shows the anticipated water demand in the District's service area for an average or "normal" water year, a single dry water year, and multiple dry water years. The Normal Water Year demand is based on data from 2000-01 which was a year of normal rainfall. According to the National Weather Service, the recorded rainfall in 2000-01 was 17.94 inches. This was one of the closest years to the historical 100 year average (16.42 inches). The Single Dry Year demand is based on the lowest rainfall year of 2001-02. The recorded rainfall in 2001-02 was 4.42 inches – the lowest recorded year in over 100 years. The three Multiple Dry-Water Year demands are based on the most recent multiple dry year period of 2001-2004.

Table 4.1 Supply Reliability

Supply Reliability in AF per Year					
			Multiple Dry-Water Years		
Supplies	**Normal Water Year**	**Single Dry Water Year**	**Year 1**	**Year 2**	**Year 3**
Imported Water	9360	10418	10418	10303	10690

The most significant reason for an increase in water demand during single dry and multiple dry years is the increased landscape irrigation that occurs to compensate for reduced rainfall.

4.4 Plans to Assure a Reliable Water Supply

The District purchases all of its water supply from West Basin MWD. While emergency connections do exist with Las Virgenes MWD and LADWP, they do not supply an adequate and reliable source. Therefore, a reliable water supply is completely dependent on the availability of water from the District's wholesaler, West Basin MWD.

West Basin MWD Reliability Plan

According to West Basin MWD's 2005 Urban Water Management Plan, West Basin MWD and Metropolitan Water District have taken important steps to reduce the vulnerability of supplies to extended droughts or other potential threats to reliability. These efforts have included using more recycled water for non-potable uses, expanding the use of local groundwater resources through conjunctive use programs, and searching for potential water transfers and exchanges with imported water supplies other than those already available to Metropolitan Water District.

Central to these efforts is the expanded use of recycled water in West Basin MWD's service area. A sharp increase in recycled water demand will result in a reduction in imported water demand beginning in 2005. According to the 2005 West Basin MWD

UWMP, imported water use in West Basin MWD's service area should decrease through 2030.

Metropolitan Water District's WSDM Plan

With the experience of the droughts of 1977-78 and 1989-92, Metropolitan Water District undertook a number of planning initiatives to ensure supply reliability. These efforts include the Integrated Resources Plan (IRP), the Water Surplus and Drought Management Plan (WSDM Plan) and other local resource investments. Together, these initiatives have provided the policy framework for Metropolitan Water District and its member agencies to manage their water resources in such a way to meet the needs of a growing population even under recurrences of the worst historical hydrologic conditions locally and in the key watersheds that supply water to southern California.

In April of 1999, Metropolitan Water District's Board of Directors adopted the WSDM Plan to guide the management of regional water supplies to achieve reliability goals of Southern California's Integrated Resources Plan (IRP). Through effective management of its water supply, Metropolitan Water District fully expects to be 100 percent reliable throughout the next 20 years.

The guiding principle of the WSDM Plan is to minimize adverse impacts of water shortage to retail customers. From this guiding principle come the following supporting principles:

- Encourage efficient water use and economical local resource programs.
- Coordinate operations with member agencies to make as much surplus water as possible available for use in dry years.
- Pursue innovative transfer and banking programs to secure more imported water for use in dry years.
- Increase public awareness about water supply issues.

The WSDM Plan further defines five surplus management stages and seven shortage management stages to guide resource management activities. Each year, Metropolitan Water District will consider the level of supplies available and existing levels of water in storage to determine the management actions designed to 1) avoid an Extreme Shortage to the maximum extent possible, and 2) minimize adverse impact to retail customers should an Extreme Shortage occur. The current sequencing outlined in the WSDM Plan reflects anticipated responses based on detailed modeling of Metropolitan Water District's existing and expected resource mix. This sequencing may change as the resource mix evolves.

The WSDM Plan also guides the operations of water resources (local resources, Colorado River, State Water Project, and regional storage) to ensure regional reliability. It identifies the expected sequence of resource management actions Metropolitan Water District will take during surpluses and shortages to minimize the probability of severe shortages that require curtailment of full-service demands.

West Basin MWD supports the WSDM plan, however, at this time the Plan does not include a detailed allocation plan. Metropolitan Water District is currently developing a plan to describe how imported water will be allocated in the event that demands exceed imported supply. Once completed, West Basin MWD will pass the allocation to it retailers. The District also has a water shortage contingency plan that is explained in Section 7 of this report.

4.5 Water Transfers or Exchanges

The District does not currently participate in any out of region water transfers. The District relies on West Basin MWD as their water supplier.

4.6 Increasing District Demands

The District's water demand is projected to increase at a steady rate. The wholesale supply of potable water available to the District from West Basin MWD is also projected to increase. The reason that West Basin is able to meet the water demands of the District is due to the increased use of recycled water by West Basin MWD's other customers. The use of recycled water reduces the demand on West Basin's imported supply which in turn increases the available imported water to the District.

5.0 SUPPLY AND DEMAND COMPARISON PROVISIONS

5.1 Supply and Demand Comparison during Normal/Average Years

The District receives 100 percent of its water supply from West Basin MWD. Therefore, the available supply from West Basin MWD must be equal to the projected water demands for the District in order for the District's supply to be 100% reliable for its customers.

Table 5-1 displays a sufficient supply to meet the demand of the District. West Basin MWD's Urban Water Management Plan projects a 100% reliable supply of water for all retail agencies served by West Basin MWD for the next 25 years. This assumption is assured through Metropolitan Water District's WSDM Plan and the Diamond Valley Reservoir.

Table 5.1 Projected Supply and Demand Comparison

Projected Supply and Demand Comparison (In Acre-Feet/Year)						
	2005	**2010**	**2015**	**2020**	**2025**	**2030**
Total supply from West Basin MWD	10,300	11,867	12,803	13,765	14,697	15,557
Total demand for the District*	9,941	11,302	12,194	13,110	13,997	14,816
Difference	**359**	**565**	**610**	**655**	**700**	**741**

*these values do not include recycled water

5.2 Supply and Demand Comparison during Dry Years

Table 5-2 presents the projected water supply compared with the potential single and multiple dry water year demands. The projected single and multiple dry water year demands were determined from historic data analyzed by West MWD and Metropolitan Water District that shows a 4 to 8 percent increase in water demands in their service areas during drought years.

Table 5.2 Current, Single and Multiple Dry Water Year Demands

		Multiple Dry-Water Year Demands		
Projected Normal Water Year Supply	Projected Single Dry Water Year Demand	Year 1	Year 2	Year 3
Fiscal Year 00-01	**Fiscal Year 01-02**	**FY 01-02**	**FY 02-03**	**FY 03-04**
9,931	10,418	10,418	10,303	10,690
2005	**2006**	**2006**	**2007**	**2008**
10,440	10,962	10,962	10,858	11,275
2010	**2011**	**2011**	**2012**	**2013**
11,302	11,867	11,867	11,754	12,206
2015	**2016**	**2016**	**2017**	**2018**
12,194	12,803	12,803	12,681	13,169
2020	**2021**	**2021**	**2022**	**2023**
13,110	13,765	13,765	13,634	14,159
2025	**2026**	**2026**	**2027**	**2028**
13,997	14,697	14,697	14,557	15,117
% of Normal	**105%**	**105%**	**104%**	**108%**

In the event of consecutive dry years and reductions in the available water from West Basin MWD, the County of Los Angeles Board of Supervisors has adopted a water shortage contingency plan known as the Phased Water Conservation Plan (PWCP). The purpose of the PWCP is to reduce overall water demands throughout the District in the event of limited water supplies. Under the PWCP reductions are made in phases to reduce water uses in percentages. Section 7 of this report gives further details of this plan.

6.0 WATER DEMAND MANAGEMENT MEASURES

On April 11, 1996, the District became signatory to the Memorandum of Understanding (MOU) regarding the California Urban Water Conservation Council (CUWCC) and is, therefore, a member of the CUWCC. Pursuant to Section 10631.h. of the Urban Water Management Plan Act (UWMPA), urban water suppliers that are members of the CUWCC may submit the annual reports identifying water demand management measures, also known as best management practices (BMPs), currently being implemented, or scheduled for implementation, to satisfy the requirements of Section 10631.f. of the UWMPA.

Please refer to Appendix C for the District's 2004 Best Management Practices Annual Report.

7.0 WATER SHORTAGE CONTINGENCY PLAN

7.1 Water Shortage Response

As a result of a significant drought that occurred in Los Angeles County between 1987 and 1991 and the associated water supply shortage, the County of Los Angeles Board of Supervisors (BOS) approved the Phased Water Conservation Plan (PWCP) on March 23, 1991. For a copy of the approved PWCP, see Appendix C. Depending upon the severity of the situation, the BOS can use the PWCP to impose phases of voluntary and mandatory water reduction of water use of up to 50% throughout the District. The objective of the PWCP is to minimize the effects of a water shortage on service area water users by encouraging customers to maximize beneficial uses of available water resources.

The PWCP is comprised of nine "Phases" that call for the reduction of water use in order to meet a conservation target. The PWCP has been implemented only once (in 1991) when the BOS determined that the District would suffer a severe water shortage unless water rationing was applied. The PWCP accomplishes this by: (1) Setting in place a conservation target in phases to reduce water usage; (2) Financially discouraging wasteful or unreasonable water use and encouraging water conservation.

Table 7-1 displays the rationing stages the BOS adopted to reduce water usage. The conservation target is a percentage of the quantity used by each customer during a baseline billing period set by the BOS.

Table 7-1 Rationing Stages

Phased Water Conservation Plan RATIONING STAGES									
	Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	**Phase 5**	**Phase 6**	**Phase 7**	**Phase 8**	**Phase 9**
Anticipated shortage in water supply	10%	15%	20%	25%	30%	35%	40%	45%	50%
Conservation Target as a Percent of Baseline Use	90%	85%	80%	75%	70%	65%	60%	55%	50%
Type of Rationing Program	Voluntary	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory

Source: Los Angeles County Ordinance No. 91-0075M

To discourage wasteful or unreasonable water use, a conservation surcharge is imposed for water use between the target goals and the baseline quantity. The conservation surcharge is $3.00 per hcf (hundred cubic feet), which is approximately double to triple the normal quantity charge for water in the District. The baseline quantity is calculated as a customer's actual water usage during the "baseline" billing period or the District average, whichever is higher. For water use in excess of the

baseline quantity, the surcharge is $6.00 per hcf, which is three to five times the normal water quantity charge in the District.

In 1991, the BOS declared a "Phased 3" water shortage for the District, which amounted to a 20 percent reduction in water usage. Therefore, a customer was charged the normal water rate for water usage up to 80 percent of the their baseline quantity. The $3.00 per hcf surcharge was applied for water usage between 80 percent and 100 percent of the baseline quantity and a $6.00 per hcf surcharge was assessed on water used in excess of 100 percent of the baseline quantity. These surcharges were in addition to the normal quantity charges for water use. In the event that a conservation phase is declared by the BOS, the Plan also calls for the water conservation measures shown in Table 7-2, as water shortage increases.

Table 7.2 Phased Water Conservation Plan

Phased Water Conservation Plan Water Conservation Measures in Phases				
Phase	**Cutback %**	**Landscape Watering Restrictions**	**Construction Meter Restrictions**	**Other Restrictions**
I	10	None	None	None
II	15	None	None	None
III	20	None	No New Construction Meters	Issuance Of "Will Serve" Letter Discontinued*
IV	25	Every Other Day	No New Construction Meters	Issuance Of "Will Serve" Letter Discontinued*
V	30	Every Other Day	No New Construction Meters	Issuance Of "Will Serve" Letter Discontinued*
VI	35	Every Third Day	No New Construction Meters	Issuance Of "Will Serve" Letter Discontinued*
VII	40	Trees and Shrubs only by Bucket	Remove All Construction Meters	Issuance Of "Will Serve" Letter and Installation of all New Permanent Meters Discontinued*
VIII	45	Trees and Shrubs only by Bucket	Remove All Construction Meters	Issuance Of "Will Serve" Letter and Installation of all New Permanent Meters Discontinued*
IX	50	Trees and Shrubs only by Bucket	Remove All Construction Meters	Issuance Of "Will Serve" Letter and Installation of all New Permanent Meters Discontinued*

"Will Serve" letters will be issued that will allow recordation of final maps; however, permanent metered service to the newly created lots will not be authorized until the current drought is over (mandatory rationing discontinued).

7.2 Catastrophic Water Supply Interruption

In the event of a catastrophe, the District will take the following measures to prevent water shortages: (1) Utilizing emergency interconnections with Las Virgenes Municipal Water District and Los Angeles Department of Water and Power, (2) Phased Water Conservation Plan, and (3) "No Waste" Ordinance.

The District has also prepared an Emergency Response Plan (ERP) that includes a response procedure for any foreseeable emergency in the District. A copy of the table of contents for the ERP is included in Appendix D.

7.3 Water Shortage Contingency Ordinances

The Board of Supervisors adopted Ordinances No. 91-0075M on May 23, 1991, which established the Phased Water Conservation Plan, and Water Wasting Prohibition Ordinance No. 91-0046U on March 21,1991. A copy of this ordinance and accompanying LA County Code is included in Appendix E.

7.4 Three Year Minimum Water Supply

The Urban Water Management Act states that an UWMP must consider the upcoming three years as dry years based on the driest three year historic sequence. Table 7-3 displays the current normal/average water year water supply for the District and the projected demands for a single dry water year and three driest water years for the District. The three driest water years for the District was from 1990 to 1992. Based on the water demand for those years the County sought, through its Phased Water Conservation Plan, a reduction in water usage from 5 percent to 3 percent.

Table 7-3 Minimum Water Supply

Minimum Water Supply (In Acre-Feet/Year)				
		Multiple Dry Water Years		
		Year	Year	Year
Average / Normal Water Year	Single Dry Water Year	2006	2007	2008
		8%	5%	3%
9,360	10,418	10,109	9,828	9,641

7.5 Water Shortage Stages Triggering Mechanisms

The PWCP's Authorization to Implement Water Conservation requires the BOS to determine the projected water shortage in the County. This can be influenced by the District's water supplier, West Basin MWD or by the regional supplier, MWD. In addition to a water supply shortage, there could be occurrences in the District that could trigger

the implementation of voluntary or mandatory water conservation, such as a break in one of the main distribution lines, landslide, or earthquake.

However, once the BOS determines a water conservation phase should be implemented, a public hearing must be held for the purposes of determining whether a shortage exists in the Districts and which phase should be implemented.

7.6 Mandatory Prohibitions on Water Wasting

On March 21, 1991, the Board of Supervisors adopted "No Waste" Ordinance No. 91-0046U that specified a number of water saving measures that applied only to unincorporated areas of the County. As shown in Appendix E, this Ordinance includes the following prohibitions:

- Washing down paved surfaces is prohibited unless required for health or safety
- Landscape watering is prohibited between 10:00 a.m. and 5:00 p.m.
- Excessive landscape watering that results in runoff into adjoining streets, parking lots or alleys is prohibited
- Plumbing leaks must be repaired as soon as practical
- Washing of vehicles is prohibited excepted at a commercial carwash or with a hand-held bucket or hose equipped with an automatic shutoff nozzle
- Serving drinking water at public eating places is prohibited unless requested by customers
- Water used in decorative fountains must flow through a recycling system

This Ordinance was enacted on March 1991 and scheduled to sunset in January 1993.

7.7 Excessive Use Penalties

Any customer that violates the regulations and restrictions on water use set forth in the "No Waste" Ordinance or Phased Water Conservation Plan shall be penalized. According to the Phased Water Conservation Plan, a customer that uses water in excess of the target quantity will be assessed a conservation surcharge of $3.00 to $6.00 per hcf on to their next water bill. In the event a customer violates the provisions in the "No Waste" Ordinance a fine of $100.00 will be issued for the first infraction and a $500.00 fine for each subsequent infractions. In addition, the District may disconnect a customer's water service if their account remains delinquent or their water use continues to be excessive during drought periods. If water service is disconnected due to excessive water use, it shall be restored upon payment of a re-connection fee as described in the District Rules and Regulations.

7.8 Revenue and Expenditure Impacts and Measures to Overcome Impacts

The implementation of the PWCP could result in a significant short-term reduction in the District's revenue. Revenue losses could range from a 10 percent during Phase 1 to approximately 50 percent by Phase 9.

The District's sources of funding are structured into four categories: Service Charge, Facility Surcharge, Water Quantity Charge, and Standby Charges. The Service Charge is a fixed connection charge based on the size of the meter. The Facility Surcharge and Water Quantity Charge are based on the actual quantity of water used each month. Standby Changes are assessed on all property and are included on the customer's owner's tax bill. A reduction in water sales will affect only the Water Quantity Charge and Facility Surcharge, which in turn affect the maintenance and operation revenues, and capital improvements for the District.

If water sales do affect the operation and maintenance revenues, the District has the following measures to reduce such an impact:

- Extra revenues contributed by the conservation surcharge. During the 1991 drought, the revenues collected from the conservation surcharge generated funds which were used to offset a portion of the operation and maintenance costs.

- Delayed capital improvement projects. If necessary, the BOS can authorize the transfer of funds in the District's Accumulative Capital Outlay (ACO) Fund allocated for capital improvement projects to be transferred to the District's General Fund.

- Increased water rates. If ACO funds are not available, the BOS could increase water rates to meet operational needs.

7.9 Reduction Measuring Mechanism in Water Use

Data on the District's supply and demand is collected and analyzed on a monthly basis. Water meter readings are collected bimonthly and compiled into yearly summaries. During drought periods, supply and demand data is produced and distributed on a monthly basis, with excess water usage violations reported to the District and the customer. Bi-monthly water meter readings are collected and analyzed to determine if the water usage has been reduced to the target goal.

8.0 WATER RECYCLING

8.1 Wastewater Collection, and Treatment

The production and use of recycled water is limited in the District because the community served is predominately on individual septic systems. A portion of the wastewater generated in the area is collected and treated by small private and publicly owned package wastewater treatment plants serving individual developments. The Los Angeles County Department of Public Works (LACDPW) operates and maintains the collection and treatment systems of three publicly-owned treatment plants (Malibu Mesa Water Reclamation Plant, Malibu Water Pollution Control Plant and Trancas Water Pollution Control Plant) serving the area. The total treatment capacity of these facilities is approximately 312,500 gallons per day (gpd).

In addition to operating the District, the LACDPW Waterworks and Sewer Maintenance Division operates the three wastewater treatment facilities in the District's service area. The Malibu Mesa Water Reclamation Plant provides primary, secondary and tertiary treatment, with disinfection by an ultraviolet system. Tertiary treatment is provided by coagulation, rapid mix, flocculation and sand filtration. The Malibu Water Pollution Control Plant provides primary and secondary treatment with sand filters. Disinfection equipment was installed in 2001. The Trancas Water Pollution Control Plant provides primary and secondary treatment with sand filters. Table 8-1 displays the wastewater collection and treatment averages and capacities for all three facilities.

Table 8.1 Wastewater Treatment

Wastewater Treatment (in gallons per day)					
Treatment Plant Name	**Location (City)**	**Average Daily Volume (2004)**	**Maximum Daily Volume (2004)**	**Year of Planned Build-out**	**Maximum Daily Volume**
Malibu Mesa Water Reclamation Plant	Malibu	152,000	200,000	Build-out Complete	200,000
Malibu Water Pollution Control Plant	Malibu	24,000	36,000	Build-out Complete	51,000
Trancas Water Pollution Control Plant	Malibu	73,000	121,000	Build-out Complete	180,000
Total			357,000		431,000

Source: County WWD

8.2 Wastewater Disposal Methods

The effluent produced is disposed using a seepage pit system or a leach field disposal system or recycled and used for irrigation. Table 8-2 displays the current and estimated wastewater disposal and recycled water use within District 29 and Marina Del Rey.

Table 8.2 Wastewater Disposal & Recycled Water Use

Estimated Wastewater Disposal & Recycled Water Use (in million of gallons)						
Destination	**Treatment Level**	**2000**	**2005**	**2010**	**2015**	**2020**
Rivers/Stream	**Tertiary**	0	2	2	2	2
Landscape	**Tertiary**	56	54	54	54	54
Leachfield	**Tertiary**	35	36	36	36	36
	Total	91	92	92	92	92

Source: County WWD

8.3 Recycled Water Currently Being Used

The Malibu Mesa Plant serves an estimated population of 3,360 persons at Pepperdine University in the unincorporated County area, and the Malibu Country Estates, a residential subdivision in the City of Malibu. The wastewater is recycled to Title 22 standards for landscape irrigation. Pepperdine University then uses the recycled water to irrigate approximately 126 acres or landscape at the campus and approximately 1.6 acres of landscape at the plant site. Recycled water generation and use has varied over the past 5 years due to the variation in the volume of wastewater produced, the demand for irrigation based on soil moisture content, and climatic factors. In 2004, nearly 100% of the 45.5 million gallons of wastewater treated at the Malibu Mesa Plant was used for landscape irrigation purposes.

Recycled water use is limited by the volume of wastewater produced and the treatment plant capacity. The LACDPW does not expect the use of recycled water to increase in the future because significant growth is not projected in the plant's service area, resulting in no plan for plant expansion.

Regional Recycled Programs

In 1991, the West Basin MWD Board of Directors authorized the West Basin Recycled Water Program to recycle up to 100,000 AF/year of wastewater from the City of Los Angeles Hyperion Treatment Plant. Deliveries of recycled water from the project began in March 1995, and today West Basin MWD distributes recycled water to over 150 customers. West Basin MWD's goal is to conduct a phased expansion of the West

Basin Recycled Water Program so that by 2030, recycled water sales will reach 60,000 AF/year, which is close to four times the amount produced currently (21,500 AF in 2005). To date, the program has saved over 48 billion gallons of imported water that would have otherwise been delivered for non-potable end uses.

Because of its remote location, the District does not currently participate in the West Basin Recycled Water Program. The District does, however, indirectly benefit from the program. The more West Basin MWD's other customers use recycled water for irrigation and process water, the more potable water will be available for the District.

8.4 Potential Uses of Recycled Water

Potential uses of recycled water in the District are landscape irrigation at parks, schools, and commercial centers. Currently, the only recycled water use is at Pepperdine University. The recycled water facilities in the District have limited potential to expand due to the capacity of the existing treatment plants.

8.5 Plan For Optimizing the Use of Recycled Water

In an effort to optimize the use of recycled water within the greater region, MWD prepared the Southern California Comprehensive Water Reclamation and Reuse Study (SCCWRRS). Under SCCWRRS, MWD has encouraged the collection and use of recycled water in Southern California. In conjunction with West Basin MWD, Metropolitan Water District, and the California Department of Water Resources, the SCCWRRS proposes a plan designed to take advantage of potential surpluses in recycled water that could serve needs in areas throughout the region.

The SCCWRRS consists of a three-part, six-year comprehensive effort to identify regional reclamation systems. Metropolitan Water District's goal is to promote efficient use of all water resources by increasing the use of recycled water and identifying opportunities for and constraints to maximizing water reuse in Southern California.

9.0 REFERENCES

Los Angeles County Department of Public Works. 2000 *Urban Water Management Plan, District No. 29 and Marina Del Rey Water System*

Metropolitan Water District of Southern California. *2005 Draft Regional Urban Water Management Plan, August 2005*

West Basin Municipal Water District. 2005 *Draft Urban Water Management Plan*

APPENDIX A

California Urban Water Management Planning Act

Established: AB 797, Klehs, 1983
Amended: AB 2661, Klehs, 1990
AB 11X, Filante, 1991
AB 1869, Speier, 1991
AB 892, Frazee, 1993
SB 1017, McCorquodale, 1994
AB 2853, Cortese, 1994
AB 1845, Cortese, 1995
SB 1011, Polanco, 1995
AB 2552, Bates, 2000
SB 553, Kelley, 2000
SB 610, Costa, 2001
AB 901, Daucher, 2001
SB 672, Machado, 2001
SB 1348, Brulte, 2002
SB 1384, Costa, 2002
SB 1518, Torlakson, 2002
AB 105, Wiggins, 2004
SB 318, Alpert, 2004

CALIFORNIA WATER CODE DIVISION 6
PART 2.6. URBAN WATER MANAGEMENT PLANNING

CHAPTER 1. GENERAL DECLARATION AND POLICY

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in

its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

CHAPTER 2. DEFINITIONS

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

CHAPTER 3. URBAN WATER MANAGEMENT PLANS
Article 1. General Provisions

10620.

(a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d)

(1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621.

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Article 2. Contents of Plans

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.
(2) A single dry water year.
(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e)

(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibition.

(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council

in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

(k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c), including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including,

but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(f) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5 Water Service Reliability

10635.

(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Articl 3. Adoption and Implementation of Plans

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644.

(a) An urban water supplier shall file with the department and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be filed with the department and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the

status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

CHAPTER 4. MISCELLANEOUS PROVISIONS

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities

Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

10657.

(a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

APPENDIX B

Phased Water Conservation Plan

(Part 5 of the LA County Rules and Regulations)

RULES AND REGULATIONS

OF THE

LOS ANGELES COUNTY

WATERWORKS DISTRICTS

AND THE

MARINA DEL REY WATER SYSTEM

Last revision adopted on
February 2005

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PART 5 - PHASED WATER CONSERVATION PLAN
SECTION A - STATEMENT OF POLICY AND DECLARATION OF PURPOSE

RULE

5-A-1 STATEMENT OF POLICY AND DECLARATION OF PURPOSE: Because of the water supply conditions prevailing in any or all of the County Waterworks Districts and/or in the area from which any or all of the Districts obtain all or a portion of their supply, the general welfare requires that the water resources available to any or all of the Districts be put to the maximum beneficial use to the extent to which they are capable, and that the unreasonable use, or unreasonable method of use of water be discouraged and that the conservation of such water be practiced with a view to the reasonable and beneficial use thereof in the interest of the people of any or all of the Districts and for the public welfare. The purpose of this Phased Water Conservation Plan is to minimize the effect of a shortage of water supplies on the customers of any or all of the Districts during a water shortage emergency.

SECTION B - AUTHORIZATION TO IMPLEMENT WATER CONSERVATION

5-B-1 AUTHORIZATION TO IMPLEMENT WATER CONSERVATION:

5-B-1a The Board of Directors of the Waterworks Districts may implement the applicable provisions of this conservation plan, following the public hearing required by Rule 5-B-1b, upon its determination that such implementation is necessary to protect the public welfare and safety.

5-B-1b The Board of Directors of the Waterworks Districts shall hold a public hearing for the purpose of determining whether a shortage exists in any or all of the Districts and which measures provided by this ordinance should be implemented. Notice of the time and place of the public hearing shall be published not less than ten (10) days before the hearing in a newspaper of general circulation within the affected District or Districts.

5-B-1c The Board of Directors shall issue its determination of shortage and corrective measures by resolution published in a daily newspaper of general circulation within the affected District or Districts. Conservation surcharges assessed per Rule 5-0-1 shall become effective no sooner than the first full billing period commencing on or after the date of such publication.

PART 5 - PHASED WATER CONSERVATION PLAN (Continued)
SECTION C - GENERAL PROHIBITION

RULE
5-C-1 GENERAL PROHIBITION:

5-C-1a No customer of the District or Districts shall make, cause, use, or permit the use of water from the District or Districts in a manner contrary to any provision of this ordinance.

5-C-1b In the area of District No. 34 Desert View Highlands known as Ritter Ranch, as defined in Agreement No. 66407 as amended between the District and Ritter Park Associates, the water use limitations contained in Agreement No. 66407 as amended shall be implemented in addition to those required by this Part of these rules.

SECTION D - PHASE I SHORTAGE

5-D-1 PHASE I SHORTAGE:

5-D-1a A Phase I Shortage shall be declared whenever the Board of Directors determines that it is likely that the District will suffer a ten percent (10%) shortage in its water supplies.

5-D-1b A customer with a meter size of one and one-half (1-1/2) inches or larger shall be billed at his or her normal established water rate for all water used up to a target quantity of ninety percent (90%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1. The base quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

5-D-1c For meter sizes of one (1) inch or less, a base quantity shall be computed and will be the larger of the following amounts:

1. The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the Board of Directors, or

2. The amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

RULE
5-D-1 PHASE I SHORTAGE: (Continued)

A customer with a meter size of one (1) inch or less shall be billed at his or her normal established water rate for all water used up to a target quantity of ninety percent (90%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per rule 5-0-1.

SECTION E - PHASE II SHORTAGE

5-E-1 PHASE II SHORTAGE:

5-E-1a A Phase II Shortage shall be declared whenever the Board of Directors determines that it is likely that the District will suffer a shortage of between ten percent (10%) and fifteen percent (15%) in its water supplies.

5-E-1b A customer with a meter size of one and one-half (1 1/2) inches or larger shall be billed at his or her normal established water rate for all water used up to a target quantity of eighty-five percent (85%) of the base quantity. All water used in

5-E-1c excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1. The base quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

5-E-1d For meter sizes of one (1) inch or less, a base quantity shall be computed and will be the larger of the following amounts:

1. The average of the water usage for all similar sized meters during the corresponding billing period to be defined by the Board of Directors, or

2. The amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

A customer with a meter size of one (1) inch or less shall be billed at his or her normal established water rate for all water used up to a target quantity of eighty-five percent (85%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1.

RULE
5-F-1 PHASE III SHORTAGE:

5-F-1a A Phase III Shortage shall be declared whenever the Board of Directors determines that it is likely that the District will suffer a shortage of between fifteen percent (15%) and twenty percent (20%) in its water supplies.

5-F-1b A customer with a meter size of one and one-half (1-1/2) inches or larger shall be billed at his or her normal established water rate for all water used up to a target quantity of eighty percent (80%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1. The base quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

5-F-1c For meter sizes of one (1) inch or less, a base quantity shall be computed and will be the larger of the following amounts:

1. The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the Board of Directors, or

2. The amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

A customer with a meter size of one (1) inch or less shall be billed at his or her normal established water rate for all water used up to a target quantity of eighty percent (80%) of the base quantity. All water used in excess of the target quantity shall be subject to a surcharge per Rule 5-0-1.

5-F-1d New meters to provide construction water service shall not be issued.

5-F-1e Water service ("Will Serve") letters will be issued, but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the Board of Directors determines that the provisions of the Phased Water Conservation Plan are no longer in effect or that the severity of the water supply condition may be reduced to a Phase I or Phase II shortage.

RULE
5-G-1 PHASE IV SHORTAGE:

5-G-1a A Phase IV Shortage shall be declared whenever the Board of Directors determines that it is likely that the District will suffer a shortage of between twenty percent (20%) and twenty-five percent (25%) in its water supplies.

5-G-1b A customer with a meter size of one and one-half (1-1/2) inches or larger shall be billed at his or her normal established water rate for all water used up to a target quantity of seventy-five percent (75%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1. The base quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

5-G-1c For meter sizes of one (1) inch or less, a base quantity shall be computed and will be the larger of the following amounts:

1. The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the Board of Directors, or

2. The amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

A customer with a meter size of one (1) inch or less shall be billed at his or her normal established water rate for all water used up to a target quantity of seventy-five (75%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1.

5-G-1d The watering of lawn, landscape or other turf area with water supplied by the District shall be limited to not more than every other day and shall be prohibited between the hours of 10:00 a.m. and 5:00 p.m.

5-G-1e New meters to provide construction water service shall not be issued.

5-G-1f Water Service ("Will Serve") letters will be issued but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the Board of Directors determines that the provisions of the Phased Water Conservation Plan are no longer in effect or that the severity of the water supply condition may be reduced to a Phase I or Phase II shortage.

RULE
5-H-1 PHASE V SHORTAGE:

5-H-1a A Phase V Shortage shall be declared whenever the Board of Directors determines that it is likely that the District will suffer a shortage of between twenty-five (25%) and thirty percent (30%) in its water supplies.

5-H-1b A customer with a meter size of one and one-half (1-1/2) inches or larger shall be billed at his or her normal established water rate for all water used up to a target quantity of seventy percent (70%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1. The base quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Supervisors.

5-H-1c For meter sizes of one (1) inch or less, a base quantity shall be computed and will be the larger of the following amounts:

1. The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the Board of Directors, or

2. The amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

A customer with a meter size of (1) inch or less shall be billed at his or her normal established water rate for all water used up to a target quantity of seventy percent (70%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1.

5-H-d The watering of lawn, landscape or other turf area with water supplied by the district shall be limited to not more than every other day and shall be prohibited between the hours of 10:00 a.m. and 5:00 p.m.

5-H-1e New meters to provide construction water service shall not be issued.

5-H-1f Water service ("Will Serve") letters will be issued but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the Board of Directors determines that the provisions of the Phased Water Conservation Plan are no longer in effect or that the severity of the water supply condition may be reduced to a Phase I or Phase II shortage.

RULE
5-I-1 PHASE VI SHORTAGE:

5-I-1a A Phase VI Shortage shall be declared whenever the Board of Directors determines that it is likely that the District will suffer a shortage of between thirty (30%) and thirty-five percent (35%) in its water supplies.

5-I-1b A customer with a meter size of one and one-half (1-1/2) inches or larger shall be billed at his or her normal established water rate for all water used up to a target quantity of sixty-five percent (65%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1. The base quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

5-I-1c For meter sizes of one (1) inch or less, a base quantity shall be computed and will be the larger of the following amounts:

1. The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the Board of Directors, or

2. The amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

A customer with a meter size of one (1) inch or less shall be billed at his or her normal established water rate for all water used up to a target quantity of sixty-five percent (65%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1.

5-I-1d The watering of lawn, landscape or other turf area with water supplied by the District shall be limited to not more than every third day and shall be prohibited between the hours of 10:00 a.m. and 5:00 p.m.

5-I-1e New meters to provide construction water service shall not be issued.

5-I-1f Water service ("Will Serve") letters will be issued but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the Board of Directors determines that the provisions of the Phased Water Conservation Plan are no longer in effect or that the severity of the water supply condition may be reduced to a Phase I or Phase II shortage.

PART 5 - PHASED WATER CONSERVATION PLAN (Continued)
SECTION J - PHASE VII SHORTAGE

RULE
5-J-1 PHASE VII SHORTAGE:

5-J-1a A Phase VII Shortage shall be declared whenever the Board of Directors determined that it is likely that the District will suffer a shortage of between thirty-five (35%) and forty percent (40%) in its water supplies.

5-J-1b A customer with a meter size of one and one-half (1-1/2) inches or larger shall be billed at his or her normal established water rate for all water used up to a target quantity of sixty percent (60%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1. The base quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

5-J-1c For meter sizes of one (1) inch or less, a base quantity shall be computed by averaging the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the Board of Directors. A customer with a meter size of one (1) inch or less shall be billed at his or her normal established water rate for all water used up to a target quantity of sixty percent (60%) of the base quantity. All water used in excess of the target quantity shall be subject to a surcharge per Rule 6-0-1.

5-J-1d The watering of lawn, landscape or other turf area with water supplied by the District shall be prohibited, except that trees and shrubs may be watered at any time by bucket.

5-J-1e All meters to provide construction water shall be removed.

5-J-1f Water service ("Will Serve") letters will be issued, but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the Board of Directors determines that the provisions of the Phased Water Conservation Plan are no longer in effect or that the severity of the water supply condition may be reduced to a Phase I or Phase II shortage.

5-J-1g No new permanent meters shall be installed.

SECTION K - PHASE VIII SHORTAGE

5-K-1 PHASE VIII SHORTAGE:

RULE

5-K-1a A Phase VIII Shortage shall be declared whenever the Board of Directors determines that it is likely that the District will suffer a shortage of between forty (40%) and forty-five percent (45%) in its water supplies.

5-K-1b A customer with a meter size of one and one-half (1-1/2) inches or larger shall be billed at his or her normal established water rate for all water used up to a target quantity of fifty-five percent (55%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1. The base quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

5-K-1c For meter sizes of one (1) inch or less, a base quantity shall be computed by averaging the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the Board of Directors. A customer with a meter size of one (1) inch or less shall be billed at his or her normal established water rate for all water used up to fifty-five percent (55%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1.

5-K-1d The watering of lawn, landscape or other turf area with water supplied by the District shall be prohibited except that trees and shrubs may be watered at any time by bucket.

5-K-1e All meters to provide construction water shall be removed.

5-K-1f Water service ("Will Serve") letters will be issued but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the Board of Directors determines that the provisions of the Phased Water Conservation Plan are no longer in effect or that the severity of the water supply condition may be reduced to a Phase I or Phase II shortage.

5-K-1g No new permanent meters shall be installed.

SECTION L - PHASE IX SHORTAGE

5-L-1 PHASE IX SHORTAGE:

5-L-1a A Phase IX Shortage shall be declared whenever the Board of Directors determines that it is likely that the District will suffer a shortage of between forty-five (45%) and fifty percent (50%) in its water supplies.

RULE

5-L-1b A customer with a meter size of one and one-half (1-1/2) inches or larger shall be billed at his or her normal established water rate for all water used up to a target quantity of fifty percent (50%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1. The base quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

5-L-1c For meter sizes of one (1) inch or less, a base quantity shall be computed by averaging the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the Board of Directors. A customer with a meter size of one (1) inch or less shall be billed at his or her normal established water rate for all water used up to a target quantity of fifty percent (50%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1.

5-L-1d The watering of lawn, landscape or other turf area including trees and shrubs, with water supplied by the District shall be prohibited.

5-L-1e All meters to provide construction water shall be removed.

5-L-1f Water service ("Will Serve") letters will be issued, but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the Board of Directors determines that the provisions of the Phased Water Conservation Plan are no longer in effect or that the severity of the water supply condition may be reduced to a Phase I or Phase II shortage.

5-L-1g No new permanent meters shall be installed.

SECTION M - RELIEF FROM COMPLIANCE

5-M-1 RELIEF FROM COMPLIANCE:

5-M-1a A customer may file an application for relief from any provisions of this ordinance. The Director of Public Works shall develop such procedures as he or she considers necessary to resolve such applications and shall, upon the filing by a customer of an application for relief, take such steps as he or she deems reasonable to resolve the application for relief. The decision of the Director of Public Works shall be final. The Director of Public Works may delegate his or her duties and responsibilities under this Rule as appropriate.

RULE

5-M-1b The application for relief may include a request that the customer be relieved, in whole or in part, from the conservation surcharge provisions of Rules 5-D-1b, 5-D-1c, 5-E-1b, 5-F-1c, 5-G-1b and 5-G-1c, 5-H-1b, 5-H-1c, 5-I-1b, 5-I-1c, 5-J-1b, 5-J-1c, 5-K-1b, 5-K-1c, 5-L-1b and 5-L-1c.

5-M-1c In determining whether to grant relief, and the nature of any relief, the Director of Public Works shall take into consideration all relevant factors including, but not limited to:

1. Whether any additional reduction in water consumption will result in unemployment;

2. Whether additional members have been added to the household;

3. Whether any additional landscaped property has been added to the property since the corresponding billing period of the base year;

4. Changes in vacancy factors in multi-family housing;

5. Increased number of employees in commercial, industrial, and governmental offices;

6. Increased production requiring increased process water;

7. Water uses during new construction;

8. Adjustments to water use caused by emergency health or safety hazards;

9. First filling of a permit-constructed swimming pool; and

10. Water use necessary for reasons related to family illness or health.

11. Whether the basic period for billing should be adjusted due to the unique circumstances of the type of facility, such as a boat, which results in irregular, intermittent periods of consumption.

RULE

5-M-1d In order to be considered, an application for relief must be filed with the District within twenty (20) days from the date the provision from which relief is sought becomes applicable to the applicant. No relief shall be granted unless the customer shows that he or she has achieved the maximum practical reduction in water consumption other than in the specific areas in which relief is being sought. No relief shall be granted to any customer who, when requested by the Director of Public Works or designee, fails to provide any information necessary for resolution of the customer's application for relief. The decision shall be issued within twenty (20) days and provided to the customer.

SECTION N - NOTIFICATION OF CUSTOMERS

5-N-1 NOTIFICATION OF CUSTOMERS:

5-N-1a Each customer will be notified on his or her bill as to what the target quantity and the base quantity will be for the applicable billing period.

SECTION O - CONSERVATION SURCHARGES

5-O-1 CONSERVATION SURCHARGES:

5-O-1a Water use in excess of target quantities specified in Rules 5-D-1b, 5-D-1c, 5-E-1b, 5-E-1c, 5-F-1b, 5-F-1c, 5-G-1b, 5-F-1c, 5-H-1b, 5-H-1c, 5-I-1b, 5-I-1c, 5-J-1b, 5-J-1c, 5-K-1b, 5-K-1c, 5-L-1b and 5-L-1c shall be subject to the following conservation surcharges:

1. A conservation surcharge of $3.00 per 100 cubic-feet shall be assessed for water usage in excess of the target quantity but less than the base quantity set in these Rules for the applicable billing cycle. This conservation surcharge shall be in addition to the normal established water rate.

2. A conservation surcharge of $6.00 per 100 cubic-feet shall be assessed for water usage in excess of the base quantity set in these Rules for the applicable billing cycle. This conservation surcharge shall be in addition to the normal established water rate.

5-O-1b Violation by any customer of the water use prohibitions of Rules 5-G-1d, 5-H-1d, 5-I-1d, 5-K-1d and 5-K-1d shall be penalized as follows:

RULE
5-O-1b (Continued)

1. First violation. The Director of Public Works or designee shall issue a written notice of the fact of a first violation to the customer.

2. Second violation. For a second violation during any one water shortage emergency, the Director of Public Works or designee shall issue a written notice of the fact of a second violation to the customer.

3. Third and subsequent violations. For a third and each subsequent violation during any one water shortage emergency, the Director of Public Works or designee may install a flow-restricting device or the service of the customer at the premises at which the violation occurred for installing and for removing the flow-restricting devices and for restoration of normal service. The charge shall be paid before normal service can be restored.

5-O-1c All monies collected by a District pursuant to this ordinance shall be deposited in that District's General Fund as reimbursement for the District's costs and expenses of administering this conservation plan.

5-O-1d The District shall give notice to customer of water conservation surcharges or of water usage violations as follows:

1. Notice of water conservation surcharges or of first and second violations of the water use prohibitions of Rules 5-G-1d, 5-H-1d, 5-I-1d, 5-J-1d, 5-K-1d and 5-L-1d shall be given to the customer in person or by regular mail.

   B. If the customer is absent from or unavailable at the premises at which the violation occurred, by leaving a copy with some person of suitable age and discretion at the premises and sending a copy through the regular mail to the address at which the customer is normally billed; or

   C. If a person of suitable age or discretion cannot be found, then by affixing a copy in a conspicuous place at the premises at which the violation occurred and also sending a copy through the regular mail to the address at which the customer is normally billed.

RULE

5-O-1e The notice of a violation of the water use prohibitions of Rules 5-G-1d, 5-H-1d, 5-I-1d, 5-J-1d, 5-K-1d and 5-L-1d shall contain a description of the facts of the violation, a statement of the possible penalties for each violation and a statement informing the customer of his right to a hearing on the merits of the violation pursuant to Rule 5-P-1.

5-O-1f Nothing in these regulations shall prohibit any customer from either installing sub-meters or from pro-rating and collecting from the ultimate users any conservation surcharges assessed when the customer's master meter measures consumption of water for multiple tenancy facilities. However, unless the sub-meters are subsequently billed directly by the District, the customer responsible for the master meter shall continue to be responsible directly to the District for all payments including conservation surcharges.

SECTION P - HEARING REGARDING VIOLATIONS

5-P-1 HEARING REGARDING VIOLATIONS:

5-P-1a Any customer receiving notice of a third or subsequent violations of the water use prohibitions of Rules 5-G-1d, 5-H-1d, 5-I-1d, 5-J-1d, 5-K-1d or 5-L-1d shall have a right to a hearing by the Director of Public Works or his designee within fifteen (15) days of a mailing or other delivery of the notice of violation.

5-P-1b The customer's written request for a hearing must be received within ten (10) days of the issuance of the notice of violation. This request shall stay installation of a flow-restricting device on the customer's premises and the assessment of any surcharge until the Director of Public Works or designee renders his or her decision. The decision shall be issued within ten (10) days of the hearing, a copy of which shall be provided to the customer.

5-P-1c The decision of the Director of Public Works shall be final except for judicial review.

SECTION Q - ADDITIONAL WATER SHORTAGE MEASURES

5-Q-1 ADDITIONAL WATER SHORTAGE MEASURES:

The Board of Directors may order implementation of water conservation measures in addition to those set forth in Rules 5-D-1, 5-E-1, 5-F-1, 5-F-1, 5-H-1, 5-I-1, 5-J-1, 5-K-1 and 5-L-1. Such additional water conservation measures shall be implemented in the manner provided in Rule 5-B-1.

PART 5 - PHASED WATER CONSERVATION PLAN (Continued)
SECTION R - PUBLIC HEALTH AND SAFETY NOT TO BE AFFECTED

RULE
5-R-1 PUBLIC HEALTH AND SAFETY NOT TO BE AFFECTED:

Nothing in this ordinance shall be construed to require the District to curtail the supply of water to any customer when such water is required by that customer to maintain an adequate level of public health and safety.

SECTION S - SEVERABILITY

5-S-1 SEVERABILITY:

If any part of this ordinance or the application thereof to any person or circumstances is for any reason held invalid or unconstitutional by a decision of any court of competent jurisdiction, the validity of the remainder of the ordinance or the application of such provision to other persons or circumstances shall not be affected. The Board of Directors of the District or Districts declares that it would have adopted this ordinance and all provisions hereof irrespective of the fact that any one or more of the provisions be declared invalid or unconstitutional.

APPENDIX C

Demand Management Measures (DMMs)

(also known as)

Water Conservation Best Management Practices (BMPs)

Reported as of 10/2

Water Supply & Reuse

Reporting Unit: **Los Angeles County Waterworks District 29 - Malibu & Marina del Rey**

Year: **2004**

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type

Total AF:

Reported as of 10/2

Accounts & Water Use

Reporting Unit Name:	Submitted to	Year:
Los Angeles County Waterworks District 29 - Malibu & Marina del Rey	CUWCC **03/07/2005**	**2004**

A. Service Area Population Information:

1. Total service area population 24900

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	7063	7293	0	0
2. Multi-Family	85	667	0	0
3. Commercial	118	441	0	0
4. Industrial	0	0	0	0
5. Institutional	29	126	0	0
6. Dedicated Irrigation	110	198	0	0
7. Recycled Water	0	0	0	0
8. Other	177	853	0	0
9. Unaccounted	NA	1137	NA	0
Total	7582	10715	0	0
	Metered		**Unmetered**	

Reported as of 10/2

Reported as of 10/2

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:

Los Angeles County Waterworks District 29 - Malibu & Marina del Rey	BMP Form Status: **100% Complete**	Year: **2004**

A. Implementation

1. Based on your signed MOU date, 04/11/1996, your Agency STRATEGY DUE DATE is:	04/11/1998
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	no
a. If YES, when was it implemented?	
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	no
a. If YES, when was it implemented?	

B. Water Survey Data

Survey Counts:	**Single Family Accounts**	**Multi-Family Units**
1. Number of surveys offered:	0	0
2. Number of surveys completed:	0	0
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	no	no
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	no	no
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	no	no
Outdoor Survey:		
6. Check irrigation system and timers	no	no
7. Review or develop customer irrigation schedule	no	no
8. Measure landscaped area (Recommended but not required for surveys)	no	no
9. Measure total irrigable area (Recommended but not required for surveys)	no	no
10. Which measurement method is typically used (Recommended but not required for surveys)		None
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	no	no
12. Have the number of surveys offered and completed, survey results, and survey costs been	no	no

tracked?

a. If yes, in what form are surveys tracked? None

b. Describe how your agency tracks this information.

C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 10/2

BMP 02: Residential Plumbing Retrofit

Reporting Unit:
Los Angeles County Waterworks District 29 - Malibu & Marina del Rey

BMP Form Status: **100% Complete**

Year: **2004**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts?	no
a. If YES, list local jurisdictions in your service area and code or ordinance in each:	
2. Has your agency satisfied the 75% saturation requirement for single-family housing units?	no
3. Estimated percent of single-family households with low-flow showerheads:	%
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units?	no
5. Estimated percent of multi-family households with low-flow showerheads:	%
6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.	

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices?	no
a. If YES, when did your agency begin implementing this strategy?	
b. Describe your targeting/ marketing strategy.	

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	0	0
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0

6. Does your agency track the distribution and cost of low-flow devices?	no
a. If YES, in what format are low-flow devices tracked?	
b. If yes, describe your tracking and distribution system :	

C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The County passed Ordinance No. 91-0097U to require all new buildings to use Ultra Low Flow Toilets (ULFT) and urinals. In addition, West Basin MWD service area and MWD has developed a ULF toilet and showerhead replacement rebate program.

E. Comments

Reported as of 10/2

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:
Los Angeles County Waterworks District 29 - Malibu & Marina del Rey

BMP Form Status: **100% Complete**

Year: **2004**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	9578
b. Determine other system verifiable uses (AF)	0
c. Determine total supply into the system (AF)	10715
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.89
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	yes
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	yes
6. Does your agency operate a system leak detection program?	yes

a. If yes, describe the leak detection program:

Los Angeles County Waterworks Districts has hires an as needed consultant to conduct leak detection throughout the year for various districts. Leaks are reported by field personnel and meter-read employees. Also, as street improvement projects are submitted for review, old deteriorated water mains are replaced. Our field personnel also report high leak incidents, which are replaced when reported. The Districts maintain leak records.

B. Survey Data

1. Total number of miles of distribution system line.	207
2. Number of miles of distribution system line surveyed.	35

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	21000	21000
2. Actual Expenditures	25462	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The water audit program in place within the County compares the supply purchased versus the water used in order to determine the water loss.

E. Comments

Reported as of 10/2

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:

Los Angeles County Waterworks District 29 - Malibu & Marina del Rey	BMP Form Status: **100% Complete**	Year: **2004**

A. Implementation

1. Does your agency require meters for all new connections and bill by volume-of-use? — yes

2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? — no

   a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?

   b. Describe the program:

3. Number of previously unmetered accounts fitted with meters during report year. — 0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? — no

   a. If YES, when was the feasibility study conducted? (mm/dd/yy)

   b. Describe the feasibility study:

2. Number of CII accounts with mixed-use meters. — 0

3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. — 0

C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? — yes

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

   All existing connections are metered and billed by volume.

E. Comments

Reported as of 10/2

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
Los Angeles County Waterworks District 29 - Malibu & Marina del Rey	**100% Complete**	**2004**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	110
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	0
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):	0
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):	0
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	no

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	no
a. If YES, when did your agency begin implementing this strategy?	
b. Description of marketing / targeting strategy:	
2. Number of Surveys Offered.	0
3. Number of Surveys Completed.	0
4. Indicate which of the following Landscape Elements are part of your survey:	
a. Irrigation System Check	no
b. Distribution Uniformity Analysis	no
c. Review / Develop Irrigation Schedules	no
d. Measure Landscape Area	no
e. Measure Total Irrigable Area	no
f. Provide Customer Report / Information	no
5. Do you track survey offers and results?	no
6. Does your agency provide follow-up surveys for previously completed surveys?	no
a. If YES, describe below:	

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets?	no
2. Number of CII mixed-use accounts with landscape budgets.	0
3. Do you offer landscape irrigation training?	no

4. Does your agency offer financial incentives to improve landscape water use efficiency? no

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? No

a. If YES, describe below:

6. Do you have irrigated landscaping at your facilities? no

a. If yes, is it water-efficient? no

b. If yes, does it have dedicated irrigation metering? no

7. Do you provide customer notices at the start of the irrigation season? no

8. Do you provide customer notices at the end of the irrigation season? no

D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

Reported as of 10/2

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:	BMP Form Status:	Year:
Los Angeles County Waterworks District 29 - Malibu & Marina del Rey	**100% Complete**	**2004**

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? Yes

   a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

   Go to West Basin's website www.westbasin.org Click on Conservation Link

2. Does your agency offer rebates for high-efficiency washers? no
3. What is the level of the rebate? 0
4. Number of rebates awarded. 0

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 10/2

BMP 07: Public Information Programs

Reporting Unit:	BMP Form Status:	Year:
Los Angeles County Waterworks District 29 - Malibu & Marina del Rey	**100% Complete**	**2004**

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

Three full-time staff dedicated to water conservation practices-newsletter, bill inserts, Web site, radio PSA's, outreach materials at public counter and at public events, planning BMP program for next year

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	no	
b. Public Service Announcement	yes	104
c. Bill Inserts / Newsletters / Brochures	yes	2
d. Bill showing water usage in comparison to previous year's usage	Yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	yes	3
g. Speaker's Bureau	no	
h. Program to coordinate with other government agencies, industry and public interest groups and media	no	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	580	580
2. Actual Expenditures	580	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 10/2

BMP 08: School Education Programs

Reporting Unit:

Los Angeles County Waterworks District 29 - Malibu & Marina del Rey	BMP Form Status: 100% Complete	Year: 2004

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? No

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	no	0	0	0
Grades 4th-6th	No	0	0	0
Grades 7th-8th	No	0	0	0
High School	No	0	0	0

3. Did your Agency's materials meet state education framework requirements? No

4. When did your Agency begin implementing this program?

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 10/2

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
Los Angeles County Waterworks District 29 - Malibu & Marina del Rey	**100% Complete**	**2004**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	no
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	no
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	no

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option?	no

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	0	0	0
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	no	no	no
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no

Agency CII Customer Incentives	Budget ($/Year)	No. Awarded to Customers	Total $ Amount Awarded
h. Rebates	0	0	0
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	no
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	no
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	0
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	0

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Program has not been implemented.

Reported as of 10/2

BMP 09a: CII ULFT Water Savings

Reporting Unit:

Los Angeles County Waterworks District 29 - Malibu & Marina del Rey	BMP Form Status: 100% Complete	Year: 2004

1. Did your agency implement a CII ULFT replacement program in the reporting year? If No, please explain why on Line B. 10. — Yes

A. Targeting and Marketing

1. What basis does your agency use to target customers for participation in this program? Check all that apply.
   - CII Sector or subsector
   - CII ULFT Study subsector targeting

   a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

   We found CII sectors and sub sectors most effective because we were able to version our marketing efforts appropriately.

2. How does your agency advertise this program? Check all that apply.
   - Direct letter
   - Bill insert
   - Newsletter
   - Web page
   - Newspapers
   - Trade publications
   - Other print media
   - Trade shows and events
   - Telemarketing

   a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

   For the purposes of this program, Trade Allies have proven to be the most effective overall marketing tool, as well as the most effective per dollar expended. Trade Allies include plumbers, distributors, retail home improvement stores and product manufacturers.

B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) — Yes
2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? — Yes
3. What is the total number of customer accounts participating in the program during the last year ? — 2

CII Subsector	Number of Toilets Replaced			
4.	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount
a. Offices	0	0	0	0
b. Retail / Wholesale	0	0	0	0

c. Hotels	0	0	0	0
d. Health	0	0	0	0
e. Industrial	0	0	0	0
f. Schools: K to 12	27	0	0	0
g. Eating	0	0	0	0
h. Government	0	0	0	0
i. Churches	0	0	0	0
j. Other	0	0	0	0

5. Program design. Rebate or voucher

6. Does your agency use outside services to implement this program? Yes

a. If yes, check all that apply. Consultant

7. Participant tracking and follow-up. Telephone
Site Visit

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

a. Disruption to business	1
b. Inadequate payback	3
c. Inadequate ULFT performance	2
d. Lack of funding	5
e. American's with Disabilities Act	0
f. Permitting	0

g. Other. Please describe in B. 9.

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other isues affecting program implementation or effectiveness.

Customers are generally more willing to participate in the program if the cost of the retrofit is in balance with the amount of the rebate, and the projected water savings is significant. Resistance occurs if the out-of-pocket expense for the retrofit is too costly and the rebate amount is too low.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	Budgeted	Actual Expenditure
a. Labor	0	0
b. Materials	0	0
c. Marketing & Advertising	0	0

d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	0	0

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution	2800
b. State agency contribution	0
c. Federal agency contribution	0
d. Other contribution	0
e. Total	2800

D. Comments

Reported as of 10/2

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Los Angeles County Waterworks District 29 - Malibu & Marina del Rey	**100% Complete**	**2004**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	$11627632
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$3603674
2. Commercial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	$517767
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$29088
3. Industrial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
4. Institutional / Government	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	$931205
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$61899
5. Irrigation	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	$236505
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$23342
6. Other	
a. Water Rate Structure	Uniform

b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	$198225
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$265805

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The District charges its customers a monthly service charge and a uniform volumetric charge.

D. Comments

Reported as of 10/2

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
Los Angeles County Waterworks District 29 - Malibu & Marina del Rey	**100% Complete**	**2004**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is this a full-time position?	yes
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?	
4. Partner agency's name:	
5. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	20%
b. Coordinator's Name	David Rydman
c. Coordinator's Title	Associate Civil Engineer
d. Coordinator's Experience and Number of Years	4 years
e. Date Coordinator's position was created (mm/dd/yyyy)	05/01/1998
6. Number of conservation staff, including Conservation Coordinator.	3

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	29000	29000
2. Actual Expenditures	29000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 10/2

BMP 13: Water Waste Prohibition

Reporting Unit:

Los Angeles County Waterworks District 29 - Malibu & Marina del Rey	BMP Form Status: **100% Complete**	Year: **2004**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? no

   a. If YES, describe the ordinance:

2. Is a copy of the most current ordinance(s) on file with CUWCC? no

   a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

   a. Gutter flooding no

   b. Single-pass cooling systems for new connections no

   c. Non-recirculating systems in all new conveyor or car wash systems no

   d. Non-recirculating systems in all new commercial laundry systems no

   e. Non-recirculating systems in all new decorative fountains no

   f. Other, please name
   No Water Wasting Ordinance yes

2. Describe measures that prohibit water uses listed above:

   On March 21, 1991, the County Board of Supervisors adopted Ordinance No. 91-0046U that called for "No Water Wasting" in only unincorporated areas of the County. They include the following measures: * Washing down paved surfaces is prohibited unless required for health or safety * Landscape watering is prohibited between 10:00 a.m. and 5:00 p.m. * Excessive landscape watering that results in runoff into adjoining streets, parking lots or alleys is prohibited * Plumbing leaks must be repaired as soon as practical * Washing of vehicles is prohibited excepted at a commercial carwash or with a hand-held bucket or hose equipped with an automatic shutoff nozzle * Serving drinking water at public eating places is prohibited unless requested by customers * Water used in decorative fountains must flow through a recycling system Failure to comply with these measures could have resulted in fines up to $500. However, this Ordinance was active from March 1991 to January 1993. Currently, there is no water wasting ordinance in effect in the District. Two cities within our service have a similar ordinance implemented the same year.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

   a. Allow the sale of more efficient, demand-initiated no

regenerating DIR models.

b. Develop minimum appliance efficiency standards that:

i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. no

ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. no

c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. no

4. Does your agency include water softener checks in home water audit programs? no

5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

See B2

E. Comments

Reported as of 10/2

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:

Los Angeles County Waterworks District 29 - Malibu & Marina del Rey	BMP Form Status: **100% Complete**	Year: **2004**

A. Implementation

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	0	0
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	**0**	**0**

6. Describe your agency's ULFT program for single-family residences.

District 29's wholesaler, West Basin MWD has increased the effort to change existing property owners toilets with ULF models through incentive programs. Some of the programs in past have included rebates of $50 for each toilet replaced with a ULF model. From 1991 to 1995 West Basin MWD rebate program replaced 493 single-family and 3,568 multi-family toilets. Over the next 20 years West Basin MWD is planning in replacing approximately 30,000 toilets in their service area.

7. Describe your agency's ULFT program for multi-family residences.

See Question 6

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

City of Malibu

B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	1200
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective

as."

In 1991, the County Board of Supervisors adopted Ordinance No. 91-0097U, which required the installation of ultra low flush toilets and urinals in all new buildings within the service area of District 29 and Marina Del Rey.

D. Comments

We plan to implement a residential ULFT program next year. The cost of each rebate has not yet been determined. Next Year's expenditure estimate assumed $30 per rebate at 200/year plus processing costs.

APPENDIX D

Emergency Response Procedures

(Table of Contents only)

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

LOS ANGELES COUNTY WATERWORKS DISTRICTS

EMERGENCY RESPONSE PROCEDURES

Approved by
Manuel del Real
Assistant Deputy Director

August 2005

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Water Conservation Requirements for the Unincorporated Los Angeles County Area

County Ordinance No. 91 - 0046U

Los Angeles, CA County Code

Title 11 HEALTH AND SAFETY

Part 4. Water Conservation Requirements for the Unincorporated Los Angeles County Area

11.38.620 Hose watering prohibition.

No person shall hose water or wash down any sidewalks, walkways, driveways, parking areas or other paved surfaces, except as is required for the benefit of public health and safety. Willful violation hereof shall be an infraction punishable by a fine of $100.00 for the first infraction and $500.00 each for subsequent infractions. (Ord. 91-0046U § 1 (part), 1991.)

11.38.630 Watering of lawns and landscaping.

A. No person shall water or cause to be watered any lawn or landscaping between the hours of ten a.m. and five p.m.
B. No person shall water or cause to be watered any lawn or landscaping more than once a day.
C. No person shall water or cause to be watered any lawn or landscaping to such an extent that runoff into adjoining streets, parking lots or alleys occurs due to incorrectly directed or maintained sprinklers or excessive watering.
D. It shall be the duty of all persons to inspect all hoses, faucets and sprinkling systems for leaks and to cause all leaks to be repaired as soon as is reasonably practicable.
E. Willful violation hereof shall be an infraction punishable by a fine of $100.00 for the first infraction and $500.00 each for subsequent infractions. (Ord. 91-0046U § 1 (part), 1991.)

11.38.640 Indoor plumbing and fixtures.

A. It shall be the duty of all persons to inspect all accessible indoor plumbing and faucets for leaks and to cause all leaks to be repaired as soon as is reasonably practicable.
B. Willful violation hereof shall be an infraction punishable by a fine of $500.00 (Ord. 91-0046U § 1 (part), 1991.)

11.38.650 Washing vehicles.

No motor vehicle, boat, trailer or other type of mobile equipment may be washed, except at a commercial carwash or with reclaimed water, unless such vehicle is washed by using a hand-held bucket or a water-hose equipped with an automatic shutoff nozzle. No person shall leave a water hose running while washing a vehicle or at any other time. Willful violation hereof shall be an infraction punishable by a fine of $100.00 for the first infraction and $500.00 each for subsequent infractions. (Ord. 91-0046U § 1 (part), 1991.)

11.38.660 Public eating places.

No restaurant, hotel, cafeteria, cafe or other public place where food is sold or served shall serve drinking water to any customer unless specifically requested to do so by such customer. Willful violation hereof shall be an infraction punishable by a fine of $100.00 for the first infraction and $500.00 each for subsequent infractions. (Ord. 91-0046U § 1 (part), 1991.)

11.38.670 Decorative fountains.

No person shall use water to clean, fill or maintain levels in decorative fountains, ponds, lakes, or other similar aesthetic structures unless such water flows through a recycling system. Willful violation hereof shall be an infraction punishable by a fine of $100.00 for the first infraction and $500.00 each for subsequent infractions. (Ord. 91-0046U § 1 (part), 1991.)

Water Demand for Parcels 10R and FF

Neptune Marina Apartments and Anchorage Project
Existing Water Demand

Land Use	Quantity	Units	Demand Factor (1)		Total Demand	
			(acre-feet/year)	(gal./day/unit)	(acre-feet/year)	(gal./day)
Residential Units						
Multi-Family	136	du	0.1344	120.00	18	16,320
Boat Slips	198	slips				
				Totals	**18**	**16,320**

du = dwelling unit
(1) The water consumption rate is from the Marina del Rey Apartment Community Draft EIR, Impact Sciences, May, 2000.

Prepared by Impact Sciences, Inc.
5/2/05

Neptune Marina Apartments and Anchorage Project
Project Water Demand

Land Use	Quantity	Units	Demand Factor (1) (acre-feet/year)	Demand Factor (1) (gal./day/unit)	Total Demand (acre-feet/year)	Total Demand (gal./day)
Neptune Marina						
Proposed						
Apartments	400	du	0.1344	120.00	54	48,000
Boat Slips	161	slips				
Project Total					**54**	**48,000**
Existing						
Apartments	136	du	0.1344	120.00	18	16,320
Boat Slips	198	slips				
Existing Total					18	**16,320**
Net						
Aparments	264	du	0.1344	120.00	35	31,680
Boat Slips	-37	slips				
				Net Totals	**35**	**31,680**

du = dwelling unit
(1) The water consumption rate is from the Marina del Rey Apartment Community Draft EIR, Impact Sciences, May, 2000.

Prepared by Impact Sciences, Inc.
5/2/05

Neptune Marina Phase II
Project Water Demand

Land Use	Quantity	Units	Demand Factor (1)		Total Demand	
			(acre-feet/year)	(gal./day/unit)	(acre-feet/year)	(gal./day)
Neptune Marina Phase II						
Proposed						
Apartments	126	du	0.1344	120.00	17	15,120
				Totals	**17**	**15,120**

du = dwelling unit
(1) The water consumption rate is from the Marina del Rey Apartment Community Draft EIR, Impact Sciences, May, 2000.

Prepared by Impact Sciences, Inc.
5/2/05

Neptune Marina Apartments and Anchorage and Neptune Marina Phase II
Cumulative and Project Water Demand

Land Use	Quantity	Units	Demand Factor (1)		Total Demand	
			(acre-feet/year)	(gal./day/unit)	(acre-feet/year)	(gal./day)
Neptune Marina (net)						
Aparments	264	du	0.1344	120.00	35	31,680
Boat Slips	-37	slips				
Subtotal					35	31,680
Neptune Marina Phase II						
Aparments	126	du	0.1344	120.00	17	15,120
Proposed Projects						
Residential Units:						
Multi-Family or Attached (2)	4,122	du	0.1344	120.00	554	494,640
HotelMotel	421	room	0.2490	222.00	105	93,462
CommercialIndustrial						
Commercial	146,068	sq. ft.	0.0001	0.05	7	7,303
Restaurant (3)	11,063	sq. ft.	0.0012	1.05	13	11,645
Office	197,058	sq. ft.	0.0001	0.05	10	9,853
Boat Slips	439	slips				
Subtotal					689	616,904
				Totals	**741**	**663,704**

Note: Numbers may not total exactly due to rounding.
du = dwelling unit; sq.ft. - square feet
(1) The water consumption rate is from the Marina del Rey Apartment Community Draft EIR, Impact Sciences, May, 2000.
(2) Includes senior care facilities.
(3) The water consumption rate is based on a wastewater generation rate of 1.00 gallons per day per square foot. The wastewater generation rate assumed to be 95 percent of the water consumption rate. The source of the wastewater generation factor is the Los Angeles County Sanitation Districts, Loadings for Each Class of Land Use (1998-99).

Prepared by Impact Sciences, Inc.
5/2/05