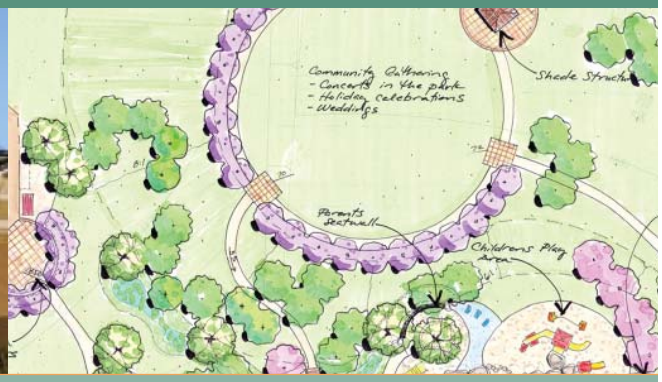
VOLUME I

Final Environmental Impact Report

TR 060922
General Plan Amendment Case No. 200900009
CUP No. 200900121
CUP No. 04-075
Oak Tree Permit No. 04-075
Highway Realignment Case No. 200900001

Skyline Ranch Project



County Project No. 04-075-(5)
State Clearinghouse No. 2004101090

County of Los Angeles
Department of Regional Planning
Impact Analysis Section
320 West Temple Street
Los Angeles, California 90012-3225

February 2010

VOLUME I

Final Environmental Impact Report

TR 060922

General Plan Amendment Case No. 200900009

CUP No. 200900121

CUP No. 04-075

Oak Tree Permit No. 04-075

Highway Realignment Case No. 200900001

Skyline Ranch Project

Prepared by:

PCR Services Corporation

233 Wilshire Boulevard

Santa Monica, California 90401

TEL 310.451.4488

FAX 310.451.5279

County Project No. 04-075-(5)

State Clearinghouse No. 2004101090

February 2010

PCR

TABLE OF CONTENTS

VOLUME I

Page

1.0 INTRODUCTION..... 1-1

2.0 COMMENTS AND RESPONSES 2-1
A. Responses to Individual Comments..... 2.A-1
B. Public Hearing Testimony and Responses.....2.B-1

3.0 CORRECTIONS AND ADDITIONS TO THE DRAFT EIR 3-1

4.0 MITIGATION MONITORING PROGRAM 4-1

VOLUME II

APPENDICES

Appendix A - Public Hearing Notice and Staff Report for the Public Hearing before the Regional Planning Commission (September 16, 2009)
Appendix B - Public Hearing Notice and Staff Report for the Public Hearing before the Regional Planning Commission (December 16, 2009)

LIST OF FIGURES

Figure		Page
2-3 (Revised)	Aerial View – Development and Conservation Areas	3-9
2-4 (New)	Mint Canyon Trail Entrance	3-10
2-5 (Revised)	Vesting Tentative Tract Map No. 060922	3-11
2-6	Proposed Entry and Other Off-Site Improvements	3-12
2-7	Skyline Ranch - Conceptual Site Plan	3-15
2-8	Proposed Public Park Plan	3-17
2-9	Proposed Parks and Trails Locations	3-18
2-10	Skyline Ranch Road Realignment (Off-Site)	3-21
2-11	Sierra Highway Striping Plan	3-22
2-12	Sierra Highway at Skyline Ranch Road Cross Section	3-23
2-13 (Revised)	Skyline Ranch Road Bridge Entrance Cross Section	3-25
2-14 (Revised)	~~**Conceptual Rendering of the**~~ Skyline Ranch Road Cross Section	3-26
2-15 (Revised)	Conceptual Rendering of the Skyline Ranch Road ~~**and Interior Loop Road**~~ Cross Sections	3-27
2-16	Interior Loop Road Cross Section	3-28
2-17	Conceptual Rendering of Roundabout Street Cross Section	3-29
2-18	Conceptual Rendering of Interior Local Street (64' R.O.W.) Cross Sections	3-30
2-19	Conceptual Rendering of Interior Local Street (60' R.O.W.) Cross Sections	3-31
2-20	Conceptual Rendering of Interior Local Street (58' R.O.W.) Cross Sections	3-32
4.B-2 (Revised)	Existing County and FEMA Flood Plain Designations	3-42
4.B-5 (Revised)	Proposed County Flood Plain Boundary	3-44
4.I-2 (Revised)	Conceptual Water Plan	3-52

LIST OF TABLES

Table		Page
2-1	Summary of Comments on the Draft EIR	2-2
2-1	Skyline Ranch Project Land Use Summary	3-14
4-1	Skyline Ranch Mitigation Monitoring Program	4-2

1.0 INTRODUCTION

A. PURPOSE OF THE FINAL EIR

The County of Los Angeles, as the Lead Agency under the California Environmental Quality Act (CEQA), has prepared this Final Environmental Impact Report (Final EIR) for the Skyline Ranch project, located in the Santa Clarita Valley west of Sierra Highway, north of Highway 14 (Antelope Valley Freeway) and the City of Santa Clarita in unincorporated Los Angeles County. The Draft EIR, comments received on the Draft EIR, and responses to these comments collectively comprise the Final EIR.

As described in Sections 15089, 15090 and 15132 of the CEQA Guidelines, the Lead Agency must prepare and consider the information contained in a Final EIR before approving a project. The purpose of a Final EIR is to incorporate into the EIR: a) comments and recommendations on the Draft EIR; b) a list of persons, organizations, and public agencies commenting on the Draft EIR; c) the Lead Agency responses to comments made by the public and agencies; and d) other information added by the Lead Agency.

B. ORGANIZATION OF THE FINAL EIR

The Final EIR consists of the following four chapters:

Chapter 1.0 Introduction. This chapter describes the purpose of the Final EIR, summarizes the Final EIR public review process, and presents the contents of this document.

Chapter 2.0 Comments and Responses. This chapter presents all comments received by the County during the 49-day public review period of the Draft EIR (July 28, 2009 through September 14, 2009) and at the public hearings before the Regional Planning Commission on September 16, 2009 and December 16, 2009, as well as the responses to those comments. Some comments received after the close of the public review period are also responded to in this section.

Chapter 3.0 Corrections and Additions to the Draft EIR. This chapter includes revisions to the Draft EIR that represent minor changes or additions in response to some of the comments received on the Draft EIR and additional edits to provide clarification. Changes to the Draft EIR are shown with ~~strikethrough~~ text for deletions and <u>underline</u>

text for additions. These changes do not add significant new information that would affect the analysis or conclusions presented in the Draft EIR.

Chapter 4.0 Mitigation Monitoring Program. The Mitigation Monitoring Program (MMP) is the document that is used by the enforcement and monitoring agencies responsible for the implementation of the proposed project's mitigation measures. Mitigation measures are listed by environmental topic.

D. OVERVIEW OF THE PUBLIC REVIEW PROCESS FOR THE DRAFT EIR

In accordance with CEQA Guidelines Section 15085, upon completion of the Draft EIR, a Notice of Completion and Availability (NOCA) as well as CD copies of the Draft EIR were submitted to the State Clearinghouse, Governor's Office of Planning and Research for distribution to State Agencies. The Draft EIR was initially circulated for a 45-day public review on July 28, 2009 through September 10, 2009. On July 30, 2009, the County of Los Angeles Department of Regional Planning extended the close of the public review period to September 14, 2009 for a total of 49 days. As required under Section 15086 of the CEQA Guidelines, a NOCA requesting comments on the Draft EIR and CDs of the Draft EIR were sent to approximately 50 public agencies and other interested parties. In compliance with CEQA Guidelines, Section 15087 the NOCA was published in The Signal Newspaper and posted with the County Clerk on July 28, 2009. Copies of the Draft EIR were also placed at the following County of Los Angeles libraries: Newhall Library, Canyon Country Jo Anne Darcy Library, Valencia Library, and Los Angeles County Public Library. The Draft EIR was also available for review on the internet at: http://www.planning.lacounty.gov/case/all The Notice of Public Review Time Extension was also distributed to agencies and interested parties and published in The Signal Newspaper.

Comments on the Draft EIR were also accepted up to and including the date of the public hearing before the Regional Planning Commission on September 16, 2009. At the time the Draft EIR was prepared, it was anticipated that the highway realignment to realign Whites Canyon Road to the proposed Skyline Ranch Road would be approved as part of the County's pending updated General Plan and updated Area Plan for the Santa Clarita Valley (or the One Valley One Vision [OVOV] plan) and therefore prior to the final public hearing before the Regional Planning Commission and Board of Supervisors for the Skyline Ranch Draft EIR. Because the approval process for the updated County General Plan and OVOV has been delayed, County staff requested that the Skyline Ranch project initiate the General Plan Amendment to amend the Los Angeles Master Plan of Highways to realign Whites Canyon Road to the proposed Skyline Ranch Road alignment as a secondary highway from Plum Canyon Road to Sierra Highway and the public hearing before the Regional Planning Commission was continued until December 16, 2009. Because a new entitlement was requested for the continued public hearing, the County

provided new and revised notices of public hearing in compliance with County Code Sections 21.16.070 and 22.60.174, posted the project site in compliance with County Code Sections 21.16.075 and 22.60.175, and posted the revised notice on the County's website at: http://www.planning.lacounty.gov/case/all and published in The Signal on November 13, 2009 and La Opinion on November 14, 2009. Comments received at both of the public hearings and during the public review period are presented and responded to in Chapter 2.0, Comments and Responses.

2.0 COMMENTS AND RESPONSES

CEQA Guidelines Section 15088(a) states that "The Lead Agency shall evaluate comments on environmental issues received from persons who reviewed the Draft EIR and shall prepare a written response. The Lead Agency shall respond to comments that were received during the noticed comment period." In accordance with these requirements, this chapter of the Final EIR provides responses to each of the written comments received during the formal public comment period on the Draft EIR and at the public hearings before the Regional Planning Commission held on September 16, 2009 and December 16, 2009 regarding the proposed Skyline Ranch project. Table 2-1, which starts on page 2-2, provides a list of the agencies, organizations, and individuals commenting on the Draft EIR and the corresponding environmental issues raised by the respective commenter's. Late comments received after the formal public comment period were also responded to. Issues identified in the matrix as "Other Comments" relate to non-CEQA issues or issues that do not address the content of the Draft EIR, such as comments expressing general support or opposition to the project.

Section 2.A, Responses to Individual Comments presents comments submitted during the public comment period for the Draft EIR from Federal, State, County and local agencies, as well as from private organizations and individuals as listed on Table 2-1. The individual letters are each assigned a letter and number based on the date of the comment letter and the affiliation, if any, of the commenter. Each comment that requires a response within the letters is also assigned a letter and number. For example, the first federal agency (Letter A) to provide comments was the Federal Emergency Management Agency (FEMA) and therefore this is Letter Number A1. The first comment received from FEMA would be Comment A1-1, and the fourth comment in Letter Number A1 would be Comment A1-4. The responses to each comment are then correspondingly numbered, (i.e., Response A1-1 and Response A1-4). The comment letter is presented first followed by the responses to the comments included in the letter. Comments received after the close of the formal public review period on the Draft EIR are also responded to in this section. Responses to these comments are provided in the same manner as responses to individual comments. Comments that have resulted in changes to the Draft EIR are identified in Table 2-1.

Section 2.B, Public Hearing Testimony and Responses provides responses to both oral comments received during the public hearings before the Regional Planning Commission held on September 16, 2009 and December 16, 2009 at the Regional Planning Commission Hearing Room. As with the comment letters received on the Draft EIR, the verbal comments received at the public hearings are presented first followed by the responses to the comments.

Table 2-1

Summary of Comments on the Draft EIR

Letter No. and Date	SUMMARY OF WRITTEN COMMENTS	Executive Summary	2.0 Project Description	3.0 Cumulative Analysis	4.A Geotechnical Resources	4.B Hydro/ Water Quality	4.C Biological Resources	4.D Cultural/ Paleo Resources	4.E Visual Qualities	4.F Traffic/Access	4.G Noise	4.H Air Quality	4.I Water Resources	4.J Wastewater Disposal	4.K Solid Waste Disposal	4.L Law Enforcement	4.M Fire Services/Hazards	4.N Education	4.O Libraries	4.P Parks	4.Q Land Use	4.R Population/Housing/Emp.	4.S Global Climate Change	5.0 Alternatives	6.0 Other CEQA Considerations	Other Comments	CHANGES TO DRAFT EIR
A. Federal Agencies																											
A1 8/7/09	U.S. Department of Homeland Security FEMA Region IX Gregor Blackburn, Branch Chief Floodplain Management and Insurance Branch 1111 Broadway, Suite 1200 Oakland, CA 94607-4052					X																					Yes Section 4.B.
A2 9/14/09	U.S. Department of the Interior Fish and Wildlife Service Chris Dellith, Senior Biologist Ventura Fish and Wildlife Office 2493 Portola Road, Suite B Ventura, CA 93003		X				X																	X			

Table 2-1 (Continued)

Summary of Comments on the Draft EIR

Letter No. and Date	SUMMARY OF WRITTEN COMMENTS	Executive Summary	2.0 Project Description	3.0 Cumulative Analysis	4.A Geotechnical Resources	4.B Hydro/ Water Quality	4.C Biological Resources	4.D Cultural/ Paleo Resources	4.E Visual Qualities	4.F Traffic/Access	4.G Noise	4.H Air Quality	4.I Water Resources	4.J Wastewater Disposal	4.K Solid Waste Disposal	4.L Law Enforcement	4.M Fire Services/Hazards	4.N Education	4.O Libraries	4.P Parks	4.Q Land Use	4.R Population/Housing/Emp.	4.S Global Climate Change	5.0 Alternatives	6.0 Other CEQA Considerations	Other Comments	CHANGES TO DRAFT EIR
B. State Agencies																											
B1 9/15/09	Governor's Office of Planning and Research Scott Morgan, Acting Director State Clearinghouse 1400 10th Street, P.O. Box 3044 Sacramento, CA 95812-3044																										
C. County Agencies																											
C1 8/20/09	County Sanitation Districts of Los Angeles County Stephen R. Maguin, Chief Engineer 1955 Workman Mill Road Whittier, CA 90601-1400														X												Yes. Section 4.K.

Table 2-1 (Continued)

Summary of Comments on the Draft EIR

Letter No. and Date	SUMMARY OF WRITTEN COMMENTS	Executive Summary	2.0 Project Description	3.0 Cumulative Analysis	4.A Geotechnical Resources	4.B Hydro/ Water Quality	4.C Biological Resources	4.D Cultural/ Paleo Resources	4.E Visual Qualities	4.F Traffic/Access	4.G Noise	4.H Air Quality	4.I Water Resources	4.J Wastewater Disposal	4.K Solid Waste Disposal	4.L Law Enforcement	4.M Fire Services/Hazards	4.N Education	4.O Libraries	4.P Parks	4.Q Land Use	4.R Population/Housing/Emp.	4.S Global Climate Change	5.0 Alternatives	6.0 Other CEQA Considerations	Other Comments	CHANGES TO DRAFT EIR
D. Regional and Local Agencies/Organizations																											
D1 9/14/09	Southern California Association of Governments Jacob Lieb, Manager Assessment, Housing & EIR 818 West Seventh Street, 12th Floor Los Angeles, CA 90017-3435																				X	X					
D2 9/14/09	City of Santa Clarita Sharon Sorensen, Senior Planner Community Development Department 23920 Valencia Boulevard, Suite 300 Santa Clarita, CA 91355-2196		X							X																	Yes. Sections 2.0 and 4.F.
D3 9/16/09	South Coast Air Quality Management District Gordon E. Mize, Air Quality Specialist CEQA Section 21865 Copley Drive Diamond Bar, CA 91765-4178											X															

Table 2-1 (Continued)

Summary of Comments on the Draft EIR

Letter No. and Date	Summary of Written Comments	Executive Summary	2.0 Project Description	3.0 Cumulative Analysis	4.A Geotechnical Resources	4.B Hydro/ Water Quality	4.C Biological Resources	4.D Cultural/ Paleo Resources	4.E Visual Qualities	4.F Traffic/Access	4.G Noise	4.H Air Quality	4.I Water Resources	4.J Wastewater Disposal	4.K Solid Waste Disposal	4.L Law Enforcement	4.M Fire Services/Hazards	4.N Education	4.O Libraries	4.P Parks	4.Q Land Use	4.R Population/Housing/Emp.	4.S Global Climate Change	5.0 Alternatives	6.0 Other CEQA Considerations	Other Comments	Changes to Draft EIR
E. Private Organizations																											
E1 9/12/09	Sierra Club Katherine Squires, Conservation Chair Santa Clarita Sierra Club 3435 Wilshire Boulevard, Suite 320 Los Angeles, CA 90010-1904		X	X	X		X	X		X		X	X				X	X				X	X	X			Yes. Section 4.D.
F. Individuals																											
F1 8/4/09	Nancy L. Corwin 28150 Haxton Drive Canyon Country, CA 91351			X					X	X		X			X	X							X				
F2 8/18/09	Lynn Kakumu 28026 Damar Court Canyon Country, CA 91351			X						X	X																
F3 9/13/09	Dianne Wohlleben 29619 Fitch Avenue Canyon Country, CA 91351		X																								

Table 2-1 (Continued)

Summary of Comments on the Draft EIR

Letter No. and Date	SUMMARY OF WRITTEN COMMENTS	Executive Summary	2.0 Project Description	3.0 Cumulative Analysis	4.A Geotechnical Resources	4.B Hydro/ Water Quality	4.C Biological Resources	4.D Cultural/ Paleo Resources	4.E Visual Qualities	4.F Traffic/Access	4.G Noise	4.H Air Quality	4.I Water Resources	4.J Wastewater Disposal	4.K Solid Waste Disposal	4.L Law Enforcement	4.M Fire Services/Hazards	4.N Education	4.O Libraries	4.P Parks	4.Q Land Use	4.R Population/Housing/Emp.	4.S Global Climate Change	5.0 Alternatives	6.0 Other CEQA Considerations	Other Comments	CHANGES TO DRAFT EIR
F4 9/14/09	Kathryn Marsailes 17601 Sierra Hill Street Canyon Country, CA 91351				X	X	X			X		X															
G. Late Letters																											
G1 10/22/09	County of Los Angeles Fire Department Frank Vidales, Acting Chief Forestry Division Prevention Services Bureau 1320 North Eastern Avenue Los Angeles, CA 90063-3294																X										Yes. Section 4.M.
G2 11/5/09	California Department of Fish and Game Edmund Pert, Regional Manager South Coast Region 4949 Viewridge Avenue San Diego, CA 92123						X																	**X**			

Table 2-1 (Continued)

Summary of Comments on the Draft EIR

Letter No. and Date	SUMMARY OF WRITTEN COMMENTS	Executive Summary	2.0 Project Description	3.0 Cumulative Analysis	4.A Geotechnical Resources	4.B Hydro/ Water Quality	4.C Biological Resources	4.D Cultural/ Paleo Resources	4.E Visual Qualities	4.F Traffic/Access	4.G Noise	4.H Air Quality	4.I Water Resources	4.J Wastewater Disposal	4.K Solid Waste Disposal	4.L Law Enforcement	4.M Fire Services/Hazards	4.N Education	4.O Libraries	4.P Parks	4.Q Land Use	4.R Population/Housing/Emp.	4.S Global Climate Change	5.0 Alternatives	6.0 Other CEQA Considerations	Other Comments	CHANGES TO DRAFT EIR
G3 11/10/09	County of Los Angeles Department of Public Works Steve Burger Land Development Division 900 South Fremont Avenue Alhambra, CA 91803		X			X				X			X	X				X									
G4 Recvd 12/7/09	Santa Monica Mountains Conservancy Ronald P. Schafer, Chairperson Ramirez Canyon Park 5750 Ramirez Canyon Road Malibu, CA 90265		X				X																	X			
H. PUBLIC HEARING SEPTEMBER 16, 2009																											
H1	Public Hearing Transcript		X				X			X		X	X					X		X	X				X		Yes. Sections 2.0, 4.F., and 4.Q.
I. PUBLIC HEARING DECEMBER 16, 2009																											

Table 2-1 (Continued)

Summary of Comments on the Draft EIR

Letter No. and Date	SUMMARY OF WRITTEN COMMENTS	Executive Summary	2.0 Project Description	3.0 Cumulative Analysis	4.A Geotechnical Resources	4.B Hydro/ Water Quality	4.C Biological Resources	4.D Cultural/ Paleo Resources	4.E Visual Qualities	4.F Traffic/Access	4.G Noise	4.H Air Quality	4.I Water Resources	4.J Wastewater Disposal	4.K Solid Waste Disposal	4.L Law Enforcement	4.M Fire Services/Hazards	4.N Education	4.O Libraries	4.P Parks	4.Q Land Use	4.R Population/Housing/Emp.	4.S Global Climate Change	5.0 Alternatives	6.0 Other CEQA Considerations	Other Comments	CHANGES TO DRAFT EIR
I1	Public Hearing Transcript		X				X			X			X				X										Yes. Section 4.I.

2. COMMENTS AND RESPONSES
A. RESPONSES TO INDIVIDUAL COMMENTS

Letter A1

AUG 13 2009

U.S. Department of Homeland Security
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052

FEMA

August 7, 2009

Michele Bush, Project Manager
County of Los Angeles, Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, California 90012

Dear Ms. Bush:

This is in response to your request for comments on the Notice of Public Review Period Time Extension/Notice of Completion and Availability Draft Environmental Impact Report for the Skyline Ranch Project County Project No. 04-075, Tract Map 060922 Conditional Use Permit and Oak Tree Permit 04-075, State Clearinghouse Number 2004101090 for Los Angeles County, California.

Please review the current effective countywide Flood Insurance Rate Maps (FIRMs) for the County of Los Angeles (Community Number 065043) and City of Santa Clarita (Community Number 060729), Maps revised September 26, 2008. Please note that the City of Santa Clarita, Los Angeles County, California is a participant in the National Flood Insurance Program (NFIP). The minimum, basic NFIP floodplain management building requirements are described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65. **A1-1**

A summary of these NFIP floodplain management building requirements are as follows:

- All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map. **A1-2**

- If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any ***development*** must not increase base flood elevation levels. **The term *development* means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials.** A hydrologic and hydraulic analysis must be performed *prior* to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways. **A1-3**

- All buildings constructed within a coastal high hazard area, (any of the "V" Flood Zones as delineated on the FIRM), must be elevated on pilings and columns, so that the lowest horizontal structural member, (excluding the pilings and columns), is elevated to or above the base flood elevation level. In addition, the posts and pilings foundation and the structure attached thereto, is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. **A1-4**

- Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA's Flood Map Revision Application Packages, please refer to the FEMA website at http://www.fema.gov/business/nfip/forms.shtm. **A1-5**

Please Note:

Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44 CFR. Please contact the local community's floodplain manager for more information on local floodplain management building requirements. The City of Santa Clarita floodplain manager can be reached by calling Christina Monde, Floodplain Coordinator, at (661) 255-4959. The Los Angeles County floodplain manager can be reached by calling George De La O, Floodplain Manager/Senior Civil Engineer, at, (626) 458-7155. **A1-6**

If you have any questions or concerns, please do not hesitate to call Cynthia McKenzie of the Mitigation staff at (510) 627-7190.

Sincerely,

Gregor Blackburn, CFM, Branch Chief
Floodplain Management and Insurance Branch

cc:
Christina Monde, Floodplain Coordinator, City of Santa Clarita
George De La O, Floodplain Manager, Senior Civil Engineer, Los Angeles County Department of Public Works
Garret Tam Sing/Salomon Miranda, State of California, Department of Water Resources, Southern District
Cynthia McKenzie, Senior Floodplanner, CFM, DHS/FEMA Region IX
Alessandro Amaglio, Environmental Officer, DHS/FEMA Region IX

LETTER NO. A1

Gregor Blackburn, CFM, Branch Chief
Floodplain Management and Insurance Branch
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

RESPONSE NO. A1-1

The Draft EIR addressed flood plains in Section 4.B, Hydrology and Water Quality with supporting data provided in Appendix C-1 and Appendix C-2 of the Draft EIR.

The Flood Insurance Rate Map (FIRM) panel No. 0607290365C, described on pages 4.B-11 and 4.B-12 in Section 4.B, Hydrology and Water Quality of the Draft EIR, was the current FIRM in effect at the time the Notice of Preparation was issued for the Draft EIR in 2004. As referenced by the commenter, the current effective FIRM is 06037C0840F, Los Angeles County Community (065043) and City of Santa Clarita Community (060729). A review of this FIRM indicates there are no notable changes in the Federal Emergency Management Agency (FEMA) Flood Zone Boundary shown on Figures 4.B-2 and 4.B-5 in the Draft EIR. However, revised figures with the updated FIRM information are provided in Chapter 3.0, Corrections and Additions to the Draft EIR, in this Final EIR.

In addition, there was a revision to the FEMA Flood Zone designation within Watershed D, at the project entrance of Sierra Highway and Skyline Ranch Road, where a proposed bridge would be located. At this location the Flood Zone designation was revised from Zone AO to Zone A. As defined on page 4.B-11 of the Draft EIR, Flood Zone A is an area subject to 100-year floods with an undetermined base flood elevation, whereas Zone AO is defined as an area subject to 100-year shallow flooding (usually sheet flow on sloping terrain) with an average depth of 1 to 3 feet with an undetermined base flood elevation. Flood Zone A would be considered a reduced hazard compared to Flood Zone AO, because Flood Zone A does not have restrictions to the average depth of flooding. Therefore, no change to the findings in the EIR regarding flood hazards is required. There is no change to the Flood Zone designation (Flood Zone A) at the southwest portion of Watershed A. However, corrections to reflect the current FIRM panel information have been incorporated into Chapter 3.0, Corrections and Additions to the Draft EIR, in this Final EIR.

The basic National Flood Insurance Program (NFIP) floodplain management building requirements were considered in the preparation of the Flood Plain Analysis as further described in Responses A1-2 through A1-5 below.

RESPONSE NO. A1-2

The majority of the project site is designated as FEMA Flood Zone D, defined as areas in which flood hazards are undetermined, but possible. As stated in Response to Comment A1-1, the entrance to the proposed project at Skyline Ranch Road and Sierra Highway is within designated FEMA Flood Zone A. Therefore the entrance is proposed to be elevated by constructing a bridge over a series of culverts which would allow water from Sierra Highway to flow under Skyline Ranch Road. Also within Zone A, a 78-inch storm drain and concrete-lined trapezoid channel is proposed on the southwestern portion of the site and would extend 1,300 feet offsite to the southwest and connect with an existing Los Angeles County Department of Public Works (LACDPW) flood control channel (Schaffer Channel). This storm drain improvement would significantly reduce and change the FEMA Flood Boundary. A Conditional Letter of Map Revision (CLOMR) showing the revised FEMA Flood Zone A Boundary for a 100-year storm event will be submitted by the project engineer to LACDPW, which will then be submitted to FEMA by LACDPW for review and approval, subsequent to approval of Vesting Tentative Tract Map No. 060922 and prior to issuance of a phased grading permit that is relevant to the encroachment and/or change to the FEMA Flood Boundary.

RESPONSE NO. A1-3

The project development area, including the entrance to the project site is not located within a Regulatory Floodway (i.e., Recorded County Floodway Boundary) as shown on Figures 4.B-2 and 4.B-5 in the Draft EIR. In order to determine potential change in base flood elevations a resulting from construction of the storm drain improvements at the project entrance (within Sierra Highway), a Flood Plain Analysis, included as Appendix C-2 of the Draft EIR, was prepared for the proposed project. As determined in this Analysis, construction of the storm drain improvements would not cause any rise in base flood levels. As stated in Mitigation Measure 4.B-1 and clarified in Chapter 3.0, Corrections and Additions to the Draft EIR, in this Final EIR, final drainage improvement plans for the project shall be designed to the satisfaction of LACDPW and the City of Santa Clarita Department of Public Works to ensure that there is no rise within the flood plain area during a 50-year storm event. A Conceptual Drainage Plan, including a hydrologic and hydraulic analysis, has been submitted to and approved by LACDPW and is provided as Appendix C-1 of the Draft EIR. As described in Response to Comment A1-2, a CLOMR showing revisions to the FEMA 100-year storm event will be submitted by the project engineer to LACDPW, which will then be submitted to FEMA for review and approval, after approval of the Tentative Tract Map and before issuance of the relevant phased grading permit by LACDPW**.** A Letter of Map Revision (LOMR) will be provided to FEMA after the phased construction that is relevant to the encroachment and/or change of the FEMA Flood Boundary is complete.

RESPONSE NO. A1-4

The proposed project is not located within a coastal high hazard area as shown on the current FIRM referenced in Response to Comment A1-1.

RESPONSE NO. A1-5

As described on pages 4.B-11 and 4.B-25 and shown on Figures 4.B-2 and Figure 4.B-5 of the Draft EIR, a change is proposed to the County Flood Plain Boundary based on recent recalculations and adjustments by the County of Los Angeles, Water Resources Division, Hydrology Development Section. As described under Response to Comment A1-2, a CLOMR will be provided to FEMA by the project engineer via LACDPW upon Tentative Tract Map approval and prior to issuance of a phased grading permit that is relevant to the encroachment and/or change of the FEMA Flood Boundary**.** A LOMR will be provided after the phased construction that is relevant to the encroachment and/or change of the FEMA Flood Boundary is complete.

RESPONSE NO. A1-6

The Drainage Concept/Hydrology/Standard Urban Storm Water Mitigation Plan and Flood Plain Analysis have been prepared in coordination with the County of Los Angeles and City of Santa Clarita and are included in Appendices C-1 and C-2 of the Draft EIR. After Tentative Tract Map approval, a formal package including final drainage improvement plans and CLOMR will be submitted to the County of Los Angeles, the City of Santa Clarita, and FEMA for final design approval prior to issuance of a phased grading permit that is relevant to the encroachment and/or change of the FEMA Flood Boundary.

Letter A2

From: Yolanda_Ledesma@fws.gov [mailto:Yolanda_Ledesma@fws.gov]
Sent: Monday, September 14, 2009 9:32 AM
To: Bush, Michele
Cc: Chris_Dellith@fws.gov; Colleen_Mehlberg@fws.gov
Subject: Notice of Completion and Availability of the DEIR, Skyline Ranch Project, County Permit No. 04-075, Santa Clarita Valley, LA County, CA, Sep 14, 2009
Importance: High

Subject letter will be mailed to Michele Bush today. **A2-1**

Yolanda M. Ledesma
OA/South Coast Division
U.S. Fish and Wildlife Office - Ventura
(805) 644-1766 ext 270

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
2009-FA-0113

September 14, 2009

SEP 16 2009

Michele Bush
Department of Regional Planning
County of Los Angeles
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, California 90012

Subject Notice of Completion and Availability of the Draft Environmental Impact Report for the Skyline Ranch Project, County Permit No. 04-075 in the Santa Clarita Valley, Los Angeles County, California

Dear Ms. Bush:

This letter provides the U.S. Fish and Wildlife Service's (Service) comments on the subject Draft Environmental Impact Report (DEIR). The notice of availability was received in our office on July 28, 2009. The proposed project is located in the Santa Clarita Valley west of Sierra Highway, north of Highway 14 and the city of Santa Clarita.

The proposed project would occupy approximately 2,173 acres and would develop approximately 622 acres of the southern portion of the site, including 1,313 lots consisting of: 1,260 residential lots, a 22-acre elementary school site, 10 lots for park areas, 13 debris basin lots, 4 water tank/booster pump station lots, and 25 open space lots. Three quarters of the site (northern 1,551 acres) is proposed to remain undeveloped, with approximately 1,355 acres dedicated or designated as open space through the establishment of the Skyline Ranch Conservation Area (SRCA). Approximately 166 acres of undeveloped land in the northern portion of the site on the Cruzan Mesa would remain undeveloped and designated as a Non-Development/Continuing Use Area. Also, within the northern portion of the site, approximately 22 acres would be preserved as a Mitigation Exchange Area for 22 acres of preserve area within adjacent recorded Tract 46018. A2-2

The project site supports 12 vegetation communities including: coastal sage scrub, disturbed coastal sage scrub, coastal sage-chaparral scrub, chaparral, non-native grassland, disturbed, barren, holly-leaved cherry scrub, southern vernal pool, developed, sycamore riparian woodland and southern willow scrub. The dominant communities on the site are coastal sage scrub and mixed coastal sage–chaparral scrub. These communities are interspersed to varying degrees within the project site and provide habitat for various wildlife species.

According to Appendix D-1, the Biological Resources Assessment (BRA) of the DEIR, the federally listed species identified, or with the potential to occur on-site include: the federally endangered Nevin's barberry (*Berberis nevinii*), slender-horned spineflower (*Dodecahema leptoceras*), California orcutt grass (*Orcuttia californica*), Riverside fairy shrimp (*Streptocephalus woottoni*), San Diego fairy shrimp (*Branchinecta sandiegonensis*), unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), arroyo toad (*Bufo californicus*), least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher (*Empidonax traillii extimus*); the threatened spreading navarretia (*Navarretia fossalis*), vernal pool fairy shrimp (*Branchinecta lynchi*), Santa Ana sucker (*Catostomus santaanae*), California red-legged frog (*Rana aurora draytonii*), and coastal California gnatcatcher (*Polioptila californica*); and the candidate San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*). This letter includes our comments regarding the federally listed species you identified, as well as endangered California condor (*Gymnogyps californianus*) and Quino checkerspot butterfly (*Euphydryas editha quino*) as they have the potential to occur within the project site. Concurrent with your determination, we do not believe the site could support the Santa Ana sucker, unarmored threespine stickleback, arroyo toad, or California red-legged frog because there is no suitable habitat onsite and thus these species will not be further discussed herein. **A2-3**

The Service's responsibilities include administering the Endangered Species Act of 1973, as amended (Act), including sections 7, 9, and 10. Section 9 of the Act prohibits the taking of any federally listed endangered or threatened species. Section 3(18) of the Act defines "take" to mean "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. The Act provides for civil and criminal penalties for the unlawful taking of listed species. Exemptions to the prohibitions against take may be obtained through coordination with the Service in two ways. If a project is to be funded, authorized, or carried out by a Federal agency, and may affect a listed species, the Federal agency must consult with the Service pursuant to section 7(a)(2) of the Act. If a proposed project does not involve a Federal agency but may result in the take of a listed animal species, the project proponent should apply to the Service for an incidental take permit pursuant to section 10(a)(1)(B) of the Act. **A2-4**

As it is not our primary responsibility to comment on documents prepared pursuant to the California Environmental Quality Act (CEQA), our comments on the DEIR do not constitute a full review of project impacts. We are providing our comments based upon a review of sections addressing biological resources, project activities that have potential to affect federally listed species, and our concerns for listed species within our jurisdiction related to our mandates under the Act. Based upon our review, we have the following concerns regarding the DEIR's characterization of impacts to federally listed species.

Surveys: The BRA includes a summary of the biological survey information in Table I. This table includes information about surveys conducted for general site reconnaissance, coastal California gnatcatcher, sensitive plants, trees, and vegetation mapping. Surveys were conducted between 2002 and 2008 with the help of 11 biologists. The scope of the information displayed in the table is extremely large and difficult to decipher. We recommend that the table be revised to better convey the information it is intended to provide. **A2-5**

Information regarding the location of all biological surveys conducted within Skyline Ranch should be disclosed in the DEIR. Even though the currently proposed development site is located in the southern portion of the Skyline Ranch site, Section 5.0 of the DEIR discusses development alternatives outside the currently proposed development site. For the discussion to address the effects of alternative development options on biological resources, the entire Skyline Ranch site should have been surveyed; however, we are unable to confirm this with the information provided. It is especially important to survey portions of the site outside of the development footprint if areas not proposed for development are to be conserved for mitigation purposes pursuant to CEQA. We reiterate that we are unable to determine from the DEIR or the BRA if the entire Skyline Ranch (2,173 acres) was surveyed for biological resources, or if surveys were only conducted within the proposed development footprint. **A2-6**

A vast majority of the sensitive plant surveys were conducted in the spring of 2003 when 15 surveys were completed, followed by five surveys in 2005. While we recognize sensitive plant surveys require a substantial commitment of resources, it should be noted that surveys conducted 6 years ago should be not relied upon to characterize the extent of current site occupation by sensitive plant species. Furthermore, the BRA sensitive plant survey report submitted by Dr. Anuja Parikh and Dr. Nathan Gale is titled “Monosabian Assemblage Site”. It unclear where the Monosabian Assemblage Site is located in regards to Skyline Ranch. The report states that survey site was bounded roughly by Sierra Highway to the southeast, Vasquez Canyon Road to the northeast, Bouquet Canyon Road to the northwest, and Plum Canyon Road to the southwest. The largest section of Plum Canyon Road lies primarily to the west of the project site but also bisects Skyline Ranch along Plum Canyon and the base of the Cruzan Mesa. The description of the sensitive plant surveys seems to indicate that surveys were only conducted above Plum Canyon Road, in the areas proposed for open space designations. Failure to survey the portion of the site that is proposed for development would inaccurately describe the impacts of the development on biological resources. **A2-7**

California Natural Diversity Database (CNDDB): The BRA frequently references the CNDDB and its role in determining which species may occur onsite. While the CNDDB is a useful resource to better understand the distribution of rare species, it does not represent all occurrences of those species and cannot be relied upon for a definitive determination of presence of a species within a selected location. As such, species not listed in the CNDDB in the project vicinity still have a potential to occur on the project site. **A2-8**

Furthermore, the references made to the CNDDB were made from a search compiled in 2004, according to the BRA. This further limits the applicability of the CNDDB to the biological **A2-9**

assessment of the project site. For example, page 28 of the BRA states that breeding coastal California gnatcatchers have not been found north of the Santa Clara River since the 1920's. Relying on information produced from the CNDDB in 2004 would not reflect the breeding pair detected in nearby Bee Canyon in 2008 or the individual that was observed calling near San Francisquito Canyon in 2006 (CNDDB 2009, occurrences 867, 853, respectively). We recommend that the information in the DEIR that has been derived from the CNDDB in 2004 be updated to reflect current species records. **A2-9** Cont'd

Quino checkerspot butterfly: Exhibit 8 of the BRA (page 31) includes the quino checkerspot in the map titled "USFWS Federally Listed Species Occurrences". The occurrence for the butterfly extends over a majority of the Skyline Ranch site; however, this map is the only place that the butterfly is acknowledged in either the DEIR or the BRA. We recommend that the BRA acknowledge why it has been excluded from the document. **A2-10**

Coastal California gnatcatcher: Contrary to the portrayal of species presence in the BRA (page 28), there are numerous observations of coastal California gnatcatchers surrounding the project site in the Newhall, Agua Dulce and Mint Canyon quadrangles of the 7.5-minute U.S. Geological Survey topographic map as recent as 2008 (CNDDB 2009). In fact, an occurrence was observed by the Service in 1998 near the site in Plum Canyon, which crosses into the Skyline Ranch property (Rick Farris, Service, pers. obs. 1998). In addition, we have indications that the coastal California gnatcatcher may be expanding its range, as it has recently been observed in locations previously considered unoccupied, including an occurrence at the California State University, Channel Islands, in Camarillo, Ventura County. Suitable habitat occurs onsite including chaparral, coastal sage chaparral scrub, coastal sage scrub, and grassland vegetation. **A2-11**

According to Table I of the BRA, focused surveys for the coastal California gnatcatcher were conducted in 2003, 2005, 2006, and 2007. Understanding the methodology of surveys conducted for the coastal California gnatcatcher is important because the DEIR states that surveys were conducted according to Service protocol. There are many requirements for a survey to be completed according to protocol, including, but not limited to: from March 15 through June 30, a minimum of six surveys must be conducted at least 1 week apart; surveys must be conducted between 6:00 am and 12:00 pm; no more than 80 acres can be surveyed per biologist per day; and the permittee must provide information in a report to the Service including the location of the surveys and complete description of survey methods including number of acres surveyed per biologist per hour and how many total acres surveyed per biologist per day. None of the aforementioned information was available in the table submitted in the BRA, and we cannot confirm the surveys were conducted to Service protocol because survey reports were not submitted to the Service containing all the elements required by the protocol. At a minimum, the table should include information about the locations of the surveys as it is not apparent that the entire project site was surveyed according to Service protocol. Finally, the table includes numbers following coastal California gnatcatcher surveys under the "survey type" column, but the table key does not explain the numerical system. **A2-12**

More importantly, we consider the surveys contained in the BRA to no longer be valid for determining the presence or absence of the coastal California gnatcatcher onsite because they are greater than 1 year old. We recommend that surveys be conducted according to Service protocol immediately prior to project related activities, including vegetation removal and construction, to ensure that no coastal California gnatcatchers are present. If coastal California gnatcatchers are detected during the surveys, the Service should be notified immediately to determine if the activities will require an incidental take permit pursuant to section 10(a)(1)(B) of the Act or if a take exemption pursuant to section 7 of the Act would be required. **A2-13**

Finally, it is unclear from the documents whether coastal California gnatcatcher surveys were conducted over the entire Skyline Ranch. The effects of the project on the coastal California gnatcatcher may extend beyond the proposed development footprint due to indirect effects (e.g., cats, lighting, noise, fuel management), or if an alternative development site is chosen. We recommend that protocol level surveys be conducted over the entire Skyline Ranch site where suitable habitat exists to allow the DEIR to adequately address the direct and indirect effects of the project on the coastal California gnatcatcher. **A2-14**

Least Bell's vireo: According to the recovery plan for the species, the least Bell's vireo is an obligate riparian breeder, typically inhabiting structurally diverse woodlands along watercourses (Service 1998). They occur in a number of riparian habitat types, including cottonwood-willow woodlands/forests, oak woodlands, and mule fate scrub. Although least Bell's vireos are tied to riparian habitat for nesting, they have been observed extending their activities into adjacent upland habitats. Least Bell's vireos along the edges of riparian corridors maintain territories that incorporate both riparian and non riparian habitat, including coastal sage scrub.

The BRA states on page 28 and in Table III-4 that no suitable habitat exists onsite for the least Bell's vireo; however, Exhibit 5 depicts a stand of southern coast live oak riparian forest within the proposed development footprint. This vegetation community could potentially support the least Bell's vireo, but it is not discussed in the document. Later in the BRA, Exhibit 10 describes the area as holly leaved cherry scrub and sycamore woodland. Exhibit 16 highlights this area and illustrates the sycamore, oak, juniper, and cottonwood trees that will be removed during the project. In other words, we are concerned that the BRA's description of the habitat is inconsistent, and we are unable to evaluate the conclusions regarding the proposed project's impact on least Bell's vireo habitat. According to information in the BRA, suitable habitat may exist on the proposed development site, and if so, impacts to the least Bell's vireo should be addressed in the DEIR. Furthermore, if the habitat is suitable, we recommend protocol-level surveys for the species throughout the suitable habitat occurring on Skyline Ranch. According to Exhibit 10, suitable habitat may also exist in the southern willow scrub vegetation communities located between Plum Canyon and the Cruzan Mesa. **A2-15**

Condor: A substantial remaining concern is that the DEIR did not address potential impacts of the proposed action on the federally endangered California condor. California condors are known to roost, forage, and feed within the vicinity, and impacts to the species should be more fully evaluated in the final EIR. To ensure the most recent information regarding California **A2-16**

condor use of the project area is considered and incorporated into the final EIR, we recommend coordinating with our office and with Jesse Grantham, the Service's California condor recovery program coordinator. Mr. Grantham can be reached at (805) 644-5185. **A2-16** Cont'd

Migratory Birds: The Service is concerned about potential impacts to migratory birds in the proposed project area during the construction of the Skyline Ranch development. We have conservation responsibilities and management authority for migratory birds under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703 *et. seq.*) (MBTA). Any land clearing or other surface disturbance associated with the proposed actions should be timed to avoid potential destruction of bird nests or young of birds that breed in the area, as such destruction may be in violation of the MBTA. Under the MBTA, nests with eggs or young of migratory birds may not be damaged, nor may migratory birds be killed. If this seasonal restriction is not possible, we recommend that a qualified biologist survey the area for nests or evidence of nesting (e.g., mated pairs, territorial defense, carrying of nesting material, transporting food, etc.) prior to the commencement of land clearing activities. If nests or other evidence of nesting are observed, a protective buffer should be established around the nests and avoided to prevent destruction or disturbance to active nests. **A2-17**

Proposed land uses:
Skyline Ranch Conservation Area (SRCA): The proposed 1,355 acre SRCA would provide on-site mitigation for the proposed 622-acre residential development's anticipated impacts on biological resources. Land within the SRCA would be protected through voluntary conservation easements, land dedications, or land set asides within the northern area of the Skyline Ranch property. The area includes the Plum Canyon vernal pool and four smaller pools on the southern portion of the Cruzan Mesa; however, the Cruzan Mesa and 9 acres of open space on the northernmost boundary of the site will be excluded from the SRCA. **A2-18**

According to the DEIR, direct and indirect degradation of habitat would be prevented in part though the steep topography that separates the SRCA from the proposed development area and through the prohibition or restriction of uses within the SRCA. The DEIR does not confirm how the land will be preserved, and what land use protections will be guaranteed within the SRCA. The summary of environmental impacts discussed in the EIR (Table ES-1) states that there will be no adverse impacts to land within the SRCA; however, without knowing what activities will prohibited or restricted within the SRCA it is difficult to determine how the project will impact the habitat within the SRCA. For example, the project proposes extend the County Trail System through the SRCA and Cruzan Mesa, which could adversely impact the biological resources of the SRCA. While off-road vehicles, domestic pets, and other harmful activities may be discouraged from using the site according to the DEIR, the trail system will increase access to the SRCA and could potentially lead to adverse impacts to sensitive species and habitats. In conclusion, we are unable to confirm that the proposed project will have no adverse impacts to the SRCA because the DEIR offers few details about the levels of land use protections, activities, and enforcement that will be ensured throughout the site. **A2-19**

Non-Development/Continuing Use Area: The Cruzan Mesa is a biologically diverse system that supports three federally listed species according to the DEIR: the vernal pool fairy shrimp, California orcutt grass, and spreading navarretia. The county of Los Angeles has proposed to designate the area as the Cruzan Mesa Vernal Pools Significant Ecological Area due to the regionally significant resources found onsite.

The Service is concerned about the impacts of excluding the Cruzan Mesa from the land use protections offered by the proposed Skyline Ranch Conservation Area. According to the DEIR, the Non-Development/Continuing Use Area would remain as open space through a recorded land use restriction; however, it is unclear how current or future activities conducted onsite may affect federally listed species. The DEIR does not make a clear distinction between the land use restrictions of SRCA and Non-Development/Continuing Use Area, or how the two will be managed by the applicant. Pages 129 and 130 of the DEIR both state that some activities, including film-making may be approved in both the SRCA and the Non-Development/Continuing Use area. The DEIR characterizes both land use designations as conservation areas, but does not explain why the two are separated. **A2-20**

According to the DEIR, the Cruzan Mesa is the only area on the Skyline Ranch site that supports federally listed species, and we recommend that the site be given the strictest land use protections possible to support the conservation of the biological resources found on the Skyline Ranch property. The federally listed species found on the Cruzan Mesa occur within vernal pool systems. According to the Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon, the major threats to vernal pool species include, but are not limited to: habitat loss and fragmentation, altered hydrology, invasive species, contaminants, inappropriate management and monitoring, overutilization, disease, and human waste, recreational use, and vandalism (Service 2005). The Cruzan Mesa and its vernal pool systems should be managed to protect vernal pool species from these threats through land use restrictions and/or active management. **A2-21**

Open Space: According to the DEIR, 9 acres of land on the northernmost portion of the Skyline Ranch property will remain as open space without conservation easements or restrictions. The site is surrounded by the Non-Development/Continuing Use Area and the SRCA. The DEIR does not explain the reasoning behind excluding the site from the SRCA or Non-Development/Continuing Use Area. The project description of the DEIR should address any plans for development or project activities within the open space area if it will not be protected as open space and the impacts of any future activities should be discussed. **A2-22**

Alternatives: The DEIR discusses three project alternatives that include residential development. Both the Reasonably Foreseeable On-Site Development and the Reduced Project A alternatives include residential development on the Cruzan Mesa. The Reduced Project B alternative would reduce the size of the currently proposed project in the southern portion of Skyline Ranch, and would not develop on the Cruzan Mesa. As previously discussed, the Cruzan Mesa is a biologically significant resource area and we agree with the DEIR's **A2-23**

determination that the Reduced Project B would be the environmentally superior alternative that meets the project objectives. We recommend the applicant pursue this development alternative. A2-23 Cont'd

Furthermore, if biological surveys were only conducted in the construction footprint of the originally proposed development, the DEIR would not be able to appropriately characterize the impacts of alternative developments outside of that area, nor the value of "conservation areas" in relation to the project impacts. Thus, the Reasonably Foreseeable On-Site Development and the Reduced Project A alternatives would not have accurately addressed the impacts to biological resources. The DEIR should more clearly state if the entire project site, including the Cruzan Mesa, was surveyed. A2-24

In summary, we find the DEIR to be lacking in the specificity of information regarding the presence of federally listed species and biological resources needed to accurately evaluate and characterize the impacts the project, as proposed, would have on these resources. We encourage that this information be gathered for evaluation by the applicant and the county of Los Angeles such that any impacts to federally listed species be avoided wherever possible or minimized to the maximum extent. We are willing and available to work with you to achieve this goal; however, any action that would result in the take of listed animal species would be subject to the prohibitions of section 9 of the Act, thus requiring some form of exemption, either through an incidental take permit or interagency consultation if a federal nexus exists. A2-25

We appreciate the opportunity to provide comments on the Skyline Ranch Residential Development DEIR. If you have any questions regarding our comments, please contact Colleen Mehlberg of our staff at (805) 644-1766, extension 221.

Sincerely,

Chris Dellith
Senior Biologist

cc:
Betty Courtney, California Department Fish and Game

LITERATURE CITED

[CNDDB] California Department of Fish and Game, Natural Diversity Database. 2009. Element occurrence reports for *Polioptila californica*. Unpublished cumulative data current to September 2009.

Rick Farris 1998. Personal observation. Fish and Wildlife Biologist, Ventura Fish and Wildlife Office. Ventura, California.

U.S. Fish and Wildlife Service. 1998. Draft recovery plan for the least Bell's vireo. U.S. Fish and Wildlife Service, Portland, Oregon. 139 pp.

U.S. Fish and Wildlife Service. 2005. Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon. U.S. Fish and Wildlife Service, Portland, Oregon. xxvi + 606 pp.

LETTER NO. A2

Chris Dellith, Senior Biologist
United States Department of Interior
Fish and Wildlife Service
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, CA 93003

RESPONSE NO. A2-1

This comment provides the transmittal for the letter, which was received by the County of Los Angeles Department of Regional Planning on September 16, 2009. Responses to the referenced letter are presented in Responses to Comments A2-2 through A2-24 below.

RESPONSE NO. A2-2

The comment is noted. This information is presented in Chapter 2.0, Project Description and Section 4.C, Biological Resources of the Draft EIR. However, it is noted that the proposed elementary school site is 11 acres, rather than 22 acres, as stated by the commenter.

RESPONSE NO. A2-3

The comment provides a context for the federally-listed species that are the subject of the letter and expresses concurrence with the findings of the Draft EIR that Santa Ana sucker, unarmored threespine stickleback, arroyo toad, and California red-legged frog do not have the potential to occur on site due to the absence of suitable habitat. Please see Responses to Comments A2-16 regarding the California condor and A2-10 regarding the Quino checkerspot butterfly.

RESPONSE NO. A2-4

The comment states the responsibilities of the U.S. Fish and Wildlife Service to administer the federal Endangered Species Act of 1973, as amended; defines key terms used in its regulatory capacities; and outlines the conditions under which its regulatory powers relative to this statute are recognized and are acknowledged. Information about the Federal Endangered Species Act, including the definition of "take" and conditions requiring a take permit is also presented on pages 4.C-4, 4.C-5 and 4.C-26 in Section 4.C, Biological Resources of the Draft EIR. Of note, however, the comment does expand on the definition of "take" to mean "to harass, harm, pursue, hunt, shoot,

wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" which is acknowledged. The comment also states that "harm" is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering" which is also acknowledged. Further, the comment states that the term "harass" is "defined by the Service as intentional or negligent actions that create the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering" which is acknowledged. Specific concerns regarding the characterization of impacts to federally listed species are addressed in Reponses to Comments A2-5 through A2-24, below.

RESPONSE NO. A2-5

Table I of Appendix D-1, Biological Resources Assessment (BRA) of the Draft EIR provides a log of survey's performed, with data regarding survey type and weather conditions listed on the table in chronological order with a legend identifying the name of the surveyors and start-stop times. Although considerable information is contained in the table due to the number of surveys performed, and it requires study, it is complete and comprehensive and provides what is intended to be conveyed regarding the basic parameters of the surveys performed. Therefore, revisions to Table I in the BRA are not warranted.

RESPONSE NO. A2-6

As described on page 4.C-7 of the Draft EIR, "NRC conducted general biological surveys of the Skyline Ranch study area in June and July 2002, March through July 2003, April through June 2005, March through June 2006, and January through June 2007." As defined on page 4.C-2 of the Draft EIR, the study area is not limited to the proposed development footprint, rather it includes the 2,173-acre project site and 60.8 acres of off-site area that would be altered to accommodate project development. The total acreage and identification of biological resources presented in Section 4.C, Biological Resources, in the tables and figures listed above, represent results of the general surveys and focused surveys for the entire 2,173-acre site and offsite areas. The evaluation of the impacts of the development alternatives, presented in Chapter 5.0, Alternatives, of the Draft EIR, was based on the configuration of the alternative site development area and the underlying biological resources that would be affected, as mapped for the entire project site. Areas proposed for mitigation, to address impacts within the proposed development footprint and affected offsite areas, are identified on Table 4.C-5, Vegetation Community Preservation and Figure 4.C-7 Proposed Conservation and Mitigation Areas.

RESPONSE NO. A2-7

The surveys for the Monosabian Assemblage covered all portions of Skyline Ranch except for small parcels added to the project study area after the survey including off-site improvement areas. However, these smaller added parcels were surveyed for sensitive plants and other biological resources at the time they were added to the study area. Whereas the vernal pool areas located on Cruzan Mesa were a focus of the study, all areas within the study area were adequately surveyed and the comment indicating that the sensitive plant surveys did not include areas south of Plum Canyon is incorrect. Concerning the commenter questioning the reliability of using data derived from sensitive plant surveys conducted in 2003 and 2005, it should be noted that the reliability of plant surveys is highly dependent on rainfall totals during the season they were conducted. According to data collected at the Los Angeles Civic Center and presented in The Los Angeles On-Line Almanac, the 130-year average seasonal rainfall is 15.04 inches. During the 2002-2003 rainy season, 16.42 inches of rain fell at the Civic Center station, indicating slightly higher than normal precipitation. During the 2004-2005 rainy season, 37.96 inches of rain fell at the season, indicating a very wet year. In both cases, conditions for sensitive plant growth are considered to be good to excellent case scenarios that reflect best case conditions for conducting surveys. Therefore, the data presented in the Draft EIR are considered to be accurate and reliable.

RESPONSE NO. A2-8

The comment regarding possible limitations to the reliance solely on CNDDB information as a definitive means to determine the presence or absence on the project site is acknowledged. In order to clarify and as stated in Section 3.1, GIS Analysis of Sensitive Species Data, on page 3 of the technical BRA (included in Appendix D-1 of the Draft EIR) "NRC incorporated sensitive species data into a GIS evaluation of the Skyline Ranch site, including occurrence data from the CNDDB and the USFWS…" Moreover, in Section 5.2, Sensitive Resources Occurring or Potentially Occurring on the Site, on page 13 of the BRA "Sources used to determine the potential occurrence of sensitive resources in the vicinity of the site include USFWS (1997a), CDFG (1996a, 1996b, 1997, 1998a, 1998b), CNPS (Tibor, 2001), California Natural Diversity Data Base (CNDDB, 2004), California Wildlife Habitat Relationships Database System (CDFG, 1991), Remsen (1978), CDFG and PRBO (2001), Jennings and Hayes (1994), and Williams (1986)." These sources include information on endangered and threatened and otherwise sensitive species of plants and animals throughout California which was also considered in determining the potential presence or absence of such species on site. Therefore, the CNDDB was only one of a number of sources consulted for this purpose, and was not used as a definitive means to determine presence or absence of a species.

RESPONSE NO. A2-9

The comment stating that the technical BRA and Draft EIR incorporated information from a records search of the CNDDB in 2004 is incorrect. As noted in the footnotes on page 4.C-28 of the Draft EIR, the latest search and data incorporated into the assessment was conducted using the 2007 edition of the CNDDB. Nevertheless, based on an updated search using the 2009 version, four sensitive species have record updates of note to the assessment since 2007. These are: the coastal California gnatcatcher (*Polioptila californica californica*), which is discussed below in Response to Comment A2-11; the unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), for which suitable habitat does not exist in the study area; spreading navarretia (*Navarretia fossalis*), which was recorded at the vernal pool in Plum Canyon as well in the vernal pools on Cruzan Mesa and which were observed at both locations as stated in the Draft EIR; and California Orcutt grass (*Orcuttia californica*), which were recorded at the Plum Canyon vernal pool and the vernal pools on Cruzan Mesa and were noted as observed at these locations in the Draft EIR. Therefore, with the exception of the coastal California gnatcatcher, the information documented in the Draft EIR reflects the current body of knowledge regarding sensitive species elements recorded in the most recent CNDDB.

Regarding the coastal California gnatcatcher, please refer to Response to Comment A2-11 below.

RESPONSE NO. A2-10

The occurrence for the Quino checkerspot butterfly (*Euphydryas editha quino*) shown on Exhibit 8 of the technical BRA is from a single sighting in 1920. The display of this occurrence was made in an attempt to capture all historical data without regard to current population distributions. According to the *Recovery Plan for the Quino Checkerspot Butterfly* (*Euphydryas editha quino*) published by the U.S. Fish and Wildlife Service, dated August 11, 2003, the species was historically distributed throughout the coastal slopes of southern California, including Los Angeles, Orange, western Riverside, San Diego, and southwestern San Bernardino counties. Figure 2, Quino Checkerspot Butterfly Historic U.S. Distribution, in that document indicates one sighting of the species in the general area of the project site that was recorded sometime between 1890 and 1986. For this reason it is mentioned in the Draft EIR. The Recovery Plan also states that although by the 1970's most of the coastal bluff and mesa habitats in southern California had been urbanized or otherwise disturbed, the species still occupied known habitat locations inland and at higher elevations in San Diego and western Riverside counties. However, by the mid-1980's, the species was thought to have disappeared from all remaining locations. Moreover, the Recovery Plan states that current information suggests that the Quino checkerspot butterfly has been extirpated from Los Angeles, Orange, and San Bernardino counties. This is further supported by the *Quino Checkerspot*

Butterfly (Euphydryas editha quino) 5-Year Review: Summary and Evaluation, published by the U.S. Fish and Wildlife Service, dated August 13, 2009, which describes the current range for the species as being multiple areas in western Riverside County, south into Mexico.

RESPONSE NO. A2-11

The comment is correct in stating that recent sightings of the coastal California gnatcatcher are not reflected in the Draft EIR. Nonetheless, as stated in the Draft EIR, "coastal sage scrub areas and adjacent areas of mixed chaparral-coastal sage scrub were considered suitable gnatcatcher habitat." The sighting of the California gnatcatcher near the site in Plum Canyon by representatives of the U.S. Fish and Wildlife Service in 1998 is not disputed. However, no information on the veracity of the recent sighting at the California State University, Channel Islands campus in Camarillo was given in the comment. Nor was any supporting information given regarding the indications that the California gnatcatcher may be expanding its range (northward). Therefore, for purposes of this response, while the comment is noted, it does not invalidate the findings of California gnatcatcher surveys on the site itself which were conducted in 2003, 2005, 2006, and 2007, and which all produced negative findings for the presence of the species on site. Furthermore, all such habitat areas over the entire site were surveyed. Based on the negative findings of surveys in 2003, 2005, 2006 and 2007, the site was concluded to be unoccupied by California gnatcatcher, and no analysis of potential direct or indirect effects on the species was warranted.

RESPONSE NO. A2-12

As summarized on page 4 and Table I of the Biological Resources Assessment (included as Appendix D-1 of the Draft EIR), all surveys for the coastal California gnatcatcher followed the protocols/guidelines published by the U.S. Fish and Wildlife Service (USFWS). Accordingly, six surveys were performed at least one week apart, between 6:00 A.M. and 12:00 P.M., within all portions of the study area containing suitable habitat. A maximum of 80 acres per person per survey day were surveyed. To ensure coverage of adjacent areas, vocalizations were broadcast outside the boundaries where suitable coastal California gnatcatcher habitat existed. All surveys were conducted under weather conditions considered to be conducive to gnatcatcher detection by the surveyors. Surveys were performed during the breeding seasons in 2003, 2005, 2006, and 2007. Specifically, the dates and times are indicated on Table I. Under the column heading “Survey/Type” the number following C indicates that this is a series of the six required surveys (e.g. C(2) is the second of a series of the six required gnatcatcher surveys that was conducted).

RESPONSE NO. A2-13

For the purpose of the Draft EIR, the surveys for California gnatcatcher are considered to be valid today for three primary reasons: 1) multiple surveys were conducted on site in 2003, 2005, 2006, and 2007 with negative findings for the presence of the species; 2) no supporting evidence was presented to support any indications that the species may be expanding its current range to include the project site in the future (see Response to Comment A2-11); and, 3) a wildfire burned all suitable habitat within the development area in 2007 and had not recovered to the point where it was considered suitable to support California gnatcatchers in 2008 and 2009; therefore the previous surveys represent conservative assumptions regarding suitable habitat.

RESPONSE NO. A2-14

Clarification about where on site the California gnatcatcher surveys were conducted is provided on page 4, second paragraph, last sentence of Appendix D-1, Biological Resources Assessment, of the Draft EIR. As stated, "coastal sage scrub areas and adjacent areas of mixed chaparral-coastal sage scrub were considered suitable gnatcatcher habitat." Furthermore, all such habitat areas over the entire site were surveyed. Based on the negative findings of surveys in 2003, 2005, 2006 and 2007, and the loss of habitat due to the 2007 wildfire, the site was concluded to be unoccupied by California gnatcatcher, and no analysis of potential direct or indirect effects on the species was warranted.

RESPONSE NO. A2-15

Exhibit 5 in the BRA reflects mapping obtained from the CNDDB. Typically, such mapping of vegetation is not based on site specific investigations and should be viewed as "broad brush" or "coarse". A more accurate characterization of the vegetation type on site is provided in Exhibit 10, Vegetation Communities, in the BRA because it was based on site inspections conducted for the specific purpose of mapping this information. As shown on Exhibit 10, the area pointed out by the commenter was determined to be sycamore riparian woodland and not southern coast live oak woodland. Moreover, the description of the sycamore riparian woodland provided on page 9 of the BRA states that this vegetation is "a patchy sycamore woodland community" where "a few small Fremont cottonwood trees occur scattered among sycamores." Based on experience gained through conducting literally thousands of hours of least Bell's vireo surveys on the part of Natural Resource Consultants' biologists, these biologists are extremely confident that this vegetation is unsuitable for occupancy by the species in the manner described by the commenter. Based on the determination that no suitable habitat for the least Bell's vireo exists at this location (see page 28 of the BRA), no analysis of potential direct and indirect impacts was warranted.

The same determination by the same biologists was made for the area mapped as southern willow scrub. As described on page 9 of the BRA, "willows are poorly represented on the site because of the low annual rainfall, highly porous sandy soils, and consequent lack of water in the drainages for most of the year, however, there is a small patch of southern willow scrub located on the north slope of Cruzan Mesa on steep terrain." It should also be noted that this area is not within the proposed development area.

RESPONSE NO. A2-16

For the purpose of the analysis provided in the Draft EIR, the California condor is not considered to be a species of concern for the proposed project based on the most current data available regarding its occurrence on site, in the vicinity of the site, and/or in the region. The comment states that California condors are known to roost, forage, and feed within the vicinity. However, although the site is acknowledged to be located within the historical range of the species, out of thousands of California condor global positioning system (GPS) locations recorded between April 2002 and June 19, 2008 and reported in the Draft Tehachapi Uplands Multi-Species Habitat Conservation Plan prepared by Dudek in 2008, there are only three locations in the vicinity of the site and no locations on the site itself. According to these data the nearest recorded perch and roost location is approximately 11 miles to the northwest of the project site, and only three recorded aerial locations (i.e., overflights) are within approximately five miles of the project site. These include two locations approximately one mile to the west and southeast, respectfully, and one location approximately two miles to the east. In comparison, there are literally thousands of locations where over-flights have been recorded and hundreds of perch and roost locations have been recorded well to the south of State Route 14 in the Santa Susana Mountains, in and between Hopper Mountain and the Mount Pinos area, and north in the Tehachapi Mountains. Given the mobility of this species, which can include foraging over 30 to 45 miles from their nesting areas, it is not surprising that they may have been rarely observed over-flying in the vicinity of the project. It should also be noted that there is no California condor critical habitat on or near the site and the nearest critical habitat is located approximately 15 miles away. Based on these recent data, the site does not support condors and no known locations of condors have been recorded on the site and it would be highly speculative and misleading for the Draft EIR to suggest otherwise.

In support of this conclusion are the findings of Bloom Biological, Inc.'s (July 13, 2007; 2007a) Late Winter and Spring Avian Survey with Focus on the California Condor (*Gymnogyps californianus*) on Portions of Newhall Land and Farming Company Property, Los Angeles County, California, which concluded “it [Newhall's Landmark Village project] will not induce significant direct impacts to the California condor resurging population, specific individuals, their individual and combined behavior, or their critical habitat.” The Newhall Landmark Village project study area included approximately 25 miles of the Santa Clara River and its major tributaries in and around Valencia, Los Angeles County. It is important to note that this conclusion of no significant impacts

for the Newhall Landmark Village project applies to a site that is within two to three miles of areas with high concentrations of condor perch, roost, and overhead sightings compared to the Skyline Ranch site which is located more than 18 miles from such areas.

RESPONSE NO. A2-17

The commenter's concern regarding migratory birds was addressed by Mitigation Measure 4.C-3, in Section 4.C, Biological Resources, of the Draft EIR, wherein provisions for avoidance of vegetation clearance during the nesting season of birds is provided for and, if impracticable, pre-construction surveys are required. As stated in this mitigation measure, these provisions are specifically directed at avoiding impacts to nesting birds protected by the Migratory Bird Treaty Act.

RESPONSE NO. A2-18

The procedures for implementation and maintenance of the SRCA, including performance standards, are described in Mitigation Measure 4.C-1, on page 4.C-72, in Section 4.C, Biological Resources, of the Draft EIR, as well as Table ES-1 of the Executive Summary. Mitigation Measure 4.C-1 requires the preservation of the SRCA through either a Declaration of Restrictions, Conservation Easement, or dedication or transfer of the land to a qualified conservation organization approved by the County and also provides for the establishment and funding of a long-term maintenance and management program in order to preserve biological resources within the SRCA. The program requires the use of signs, and where appropriate, other management practices to discourage off-road vehicles, domestic pets, and other activities harmful to natural lands. Any continued use of lands within the SRCA, could only occur with approval by the SRCA habitat manager upon a demonstration that the uses would not be incompatible with the resource conservation objectives of the SRCA. Furthermore, Mitigation Measure 4.C-2 requires preservation of the vernal pool and artificial pool habitats within the SRCA subject to RWQCB jurisdiction. While more specific details regarding restrictions would be established through the SRCA, Mitigation Measure 4.C-1 provides a series of performance standards that must be met to ensure significant impacts are avoided. Furthermore, all mitigation measures would be implemented through a Mitigation Monitoring Program (MMP) as required by CEQA. The MMP is included as Chapter 4.0 of this Final EIR.

RESPONSE NO. A2-19

The extension of the Mint Canyon Trail from Vasquez Canyon Road to the Plum Canyon Fire Road would be implemented along an existing dirt path and therefore, would not adversely affect sensitive resources. No grading would occur along the trail easement, with the exception of

grading at the proposed Mint Canyon Trail trailhead entrance at Vasquez Canyon Road to provide a switch back trail, as shown on the revised Vesting Tentative Tract No. 060922 (see new Figure 2-4, Mint Canyon Trail Entrance, in Chapter 3.0, Corrections and Additions to the Draft EIR.) Grading for this portion of the trail would occur within an area of approximately 7,405 square feet that is primarily dirt with little to no vegetation. The switchback trail is located within an area designated as Open Space without conservation easements or restrictions, due to the lack of notable biological resources. Grading for the trial could include erosion control measures as needed, such as sandbagging, to minimize soil erosion and stormwater runoff to the existing drainage inlet north of Vasquez Canyon Road.

Regarding the concern the trail system will increase access to the SRCA with potential impacts to sensitive species and habits, Draft EIR Mitigation Measure 4.C-1 includes performance standards that specify in part that: "An on-going maintenance and management program shall be adequately funded and implemented to ensure the long-term integrity of biological resources within the 1,355-acre SRCA." And that: "Direct and indirect degradation of habitat shall be prevented … through the prohibition or restriction of uses within the SRCA,"

RESPONSE NO. A2-20

As described in Chapter 2.0, Project Description of the Draft EIR, the Non-Development Continuing Use Area encompasses the portion of the site that was previously approved for the development of 200 residential lots. This area is currently being leased by a film production company and had been previously used for cattle grazing. There is also a landing strip (which was in use until the 1980s) located within this area. Therefore, the Non-Development Continuing Use Area has been disturbed by previous activities to a greater extent than the SRCA. As shown on Figure 4.C-1, Vegetation Communities of the Draft EIR, the vast majority of the 166-acre Non-Development/Continuing Use Area supports non-native grasslands, disturbed areas, and disturbed coastal sage scrub. As such, this area does not provide in-kind conservation mitigation for impacts to any vegetation community that would be impacted by the proposed project; and therefore was not included in the SCRA which was established to off-set project impacts. Unlike the SRCA, no changes to this area or currently allowed uses within this area, including film-making activities, are proposed. Nonetheless, a Declaration of Restrictions (or similar, recorded land use restriction) would be placed over the 166-acre area to prevent buildings from being established within this area. Furthermore, no changes are proposed to fencing or other existing procedures that protect the vernal pools within the Non-Development Continuing Use Area.

RESPONSE NO. A2-21

Please refer to Response to Comments A2-18 through A2-20 regarding potential impacts to the vernal pools. As indicated, the proposed project offers protections to the vernal pools that are not currently in place. The project places the vernal pools into lands previously approved for development into perpetual open space. No grading activities within or adjacent to the vernal pools would occur as part of the proposed project. As indicated in Response to Comment A2-19, the vernal pools are fenced and fencing of these areas would not be affected by the proposed project.

RESPONSE NO. A2-22

As stated by the commenter and shown on Figure 2-3 of the Draft EIR, there are nine acres of open space at the northernmost edge of the project site without conservation restrictions or easements. The nine acres are located outside of the proposed SEA area, on land that does not include sensitive habitat or species. The land is not required for project mitigation and not credited as providing mitigation for impacts on biological resources in the Draft EIR. Therefore, not placing restrictions on the open space area as part of project development would not cause a biological resources impact to occur. As stated in Response to Comment A2-19, the Mint Canyon Trail would extend into this area. No other plans for development are proposed within this area.

RESPONSE NO. A2-23

The comments regarding the project alternatives and EIR identification of and Agency support for Reduced Project Alternative B as an environmentally superior alternative are noted for the consideration of the decision-makers. However, it should be clarified that the Draft EIR did not simply indicate that Reduced Project Alternative B meets the project objectives. Rather, it states more specifically in Section 5.A, Alternatives, on page 5-59, that: "…Reduced Project Alternative B would not fulfill certain objectives to the same degree as the proposed project. For example, due to the reduction in the amount of residential development, the Alternative would not increase the supply of housing to serve existing and future needs in the Santa Clarita Valley to the same degree as the proposed project. This Alternative would also not fulfill park and recreation objectives to the same extent as the proposed project, since no trail easement would be provided to support the extension of the County Trail System. Additionally, Reduced Project Alternative B would not fulfill the mobility objective of providing for the major highway improvement involving the Whites Canyon Extension to Sierra Highway, as proposed by the project and conditionally approved and shown on the County's Draft Highway Plan. Without this highway improvement as part of the project, the County's ability to complete such a connection could be compromised, as it would not be substantially funded by the project and its implementation, if it were to occur, could be significantly delayed."

RESPONSE NO. A2-24

As stated in Response to Comment A2-6, biological surveys were conducted over the entire site and impacts to biological resources were adequately addressed under the Reasonably Foreseeable On-Site Development and Reduced Project Alternatives in light of the biological resources within the areas associated with these alternatives. In accordance with CEQA Guidelines Section 15126.6(d), each alternative presented in Chapter 5.0 of the Draft EIR, was evaluated in sufficient detail to determine whether impacts on biological resources would be less, similar, or greater than the proposed project.

RESPONSE NO. A2-25

Please see Responses to Comments A2-5 through A2-24 regarding the issues raised by the commenter.

Letter B1

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

ARNOLD SCHWARZENEGGER
GOVERNOR

CYNTHIA BRYANT
DIRECTOR

September 15, 2009

RECEIVED
SEP 21 2009

Michele Bush
Los Angeles County Department of Regional Planning
320 W. Temple Street
Los Angeles, CA 90012

Subject: Skyline Ranch Project, Project No. 04-075, Tract Map No. 060922
SCH#: 2004101090

Dear Michele Bush:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. The review period closed on September 14, 2009, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. B1-1

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Scott Morgan
Acting Director, State Clearinghouse

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2004101090
Project Title Skyline Ranch Project, Project No. 04-075, Tract Map No. 060922
Lead Agency Los Angeles County

Type EIR Draft EIR

Description NOTE: Review Per Lead

The proposed Skyline Ranch project site occupies ~2,173 acres. The project is a request to develop on ~622 acres of the site, which includes 1,313 lots consisting of 1,260 residential lots, an ~11 acre elementary school site, 10 lots for park areas, 13 debris basin lots, 4 water tank/booster pump station lots and 25 open space lots. Nearly 3 quarters of the site (northern 1,551 acres) is proposed to remain undeveloped, with ~1,355 acres dedicated or designated as a Non-Development/Continuing Use Area. Also within the northern portion of the site ~22 acres would be preserved as a Mitigation Exchange Area for 22 acres of preserve area within adjacent recorded Tract 46018. The project includes a Conditional Use Permit application due to Density-Controlled Development and Hillside Management Areas; and an Oak Tree Permit for the removal of one oak tree.

Lead Agency Contact

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

Project Location

County Los Angeles
City Santa Clarita
Region
Lat / Long 34° 16.9' 26" N / 118° 17.4' 27" W
Cross Streets Sierra Highway, Whites Canyon Rd
Parcel No. 2839-0-17 to 19, 2802-02-1, 3 to 8, 10 to 12, 15, 2812-3-45, 4, 27, 2, 2802-03-1, 5, 2812-4-11
Township 4N **Range** 15W **Section** 3,9,10 **Base** SBB&M

Proximity to:

Highways 14
Airports None
Railways Metrolink
Waterways Santa Clara River, Mint Canyon
Schools Sangus HS,Arroyo Seco Jr High,Leona Cox ES,Mint Canyon ES
Land Use Vacant (occasional filming use) / A-2-1, A-1-1, A-1-10,000 / Non-urban

---

Project Issues Aesthetic/Visual; Air Quality; Archaeologic-Historic; Biological Resources; Cumulative Effects; Drainage/Absorption; Flood Plain/Flooding; Geologic/Seismic; Growth Inducing; Landuse; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wildlife

---

Reviewing Agencies Resources Agency; Department of Conservation; Department of Fish and Game, Region 5; Office of Historic Preservation; Department of Parks and Recreation; Office of Emergency Services; California Highway Patrol; Caltrans, District 7; Department of Housing and Community Development; Department of Health Services; Regional Water Quality Control Board, Region 4; Department of Toxic Substances Control; Native American Heritage Commission; Public Utilities Commission

Note: Blanks in data fields result from insufficient information provided by lead agency.

Document Details Report
State Clearinghouse Data Base

Date Received 07/28/2009 ***Start of Review*** 07/28/2009 ***End of Review*** 09/14/2009

Note: Blanks in data fields result from insufficient information provided by lead agency.

LETTER NO. B1

Scott Morgan, Acting Director
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit
1400 10th Street
P.O. Box 3044
Sacramento, CA 95812-3044

RESPONSE NO. B1-1

The comment is noted. It is also acknowledged that no State agencies that received copies of the Draft EIR from the State Clearinghouse submitted comments to the State Clearinghouse or Los Angeles County Department of Regional Planning by September 14, 2009. Refer to Letter G2 for a late comment, dated November 5, 2009 that was provided by the California Department of Fish and Game.

Letter C1

WATER RECLAMATION
SOLID WASTE MANAGEMENT

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422
www.lacsd.org

STEPHEN R. MAGUIN
Chief Engineer and General Manager

August 20, 2009

File No. 31R-3100.10

Ms. Michele Bush
County of Los Angeles
Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, CA 90012

AUG 24 2009

Dear Ms. Bush:

Comments on the Draft Environmental Impact Report (DEIR)
for the Skyline Ranch Project Santa Clarita Valley, CA

The County Sanitation Districts of Los Angeles County (Districts) received the subject CEQA document on July 31, 2009. Regarding solid waste management for the above-mentioned project in unincorporated County of Los Angeles, the Districts offer the following comments:

1. The Districts are a partnership of 24 independent special districts providing wastewater and solid waste management services for about 5.3 million people in Los Angeles County. The Districts' service area covers approximately 820 square miles and encompasses 78 cities and unincorporated territory within the county. On the solid waste management side, the Districts operate three active sanitary landfills, four landfill energy recovery facilities, two recycle centers, three materials recovery/transfer facilities, and participate in the operation of two refuse-to-energy facilities. **C1-1**

   There are seven major public and private landfills operating in Los Angeles County. The Puente Hills Landfill (PHLF), located at 13130 Crossroads Parkway South in the City of Industry is the closest landfill operated by the Districts that could be used by the proposed project. The conditional use permit (CUP) for the PHLF authorizes the disposal of a maximum of 13,200 tons per day. Disposal operations will continue under the CUP until November 1, 2013. The site will then stop accepting waste for disposal.

   Recognizing that in-county disposal capacity is finite, in the long term there will be a need for out-of-county disposal capacity. To that end, the Sanitation Districts have pursued additional capacity through the use of a waste-by-rail system. The Districts are currently in the process of designing and constructing the rail facilities necessary to begin Waste-by-Rail operation by 2011/2012. The City of Industry Planning Commission approved the CUP for the Puente Hills Intermodal Facility (PHIMF) in June 2008. The PHIMF will be used for loading and unloading rail-ready shipping containers for the Waste-by-Rail system. The containers will then be transported to the Mesquite Regional Landfill in Imperial County for disposal. **C1-2**

Other solid waste management facilities operated by the Districts that are available to the proposed project and offer recycling options are the Commerce Refuse-to-Energy Facility (CREF), the Downey Area Recycling and Transfer Facility (DART), the South Gate Transfer Station, and the Puente Hills Materials Recovery Facility (PHMRF). CREF is located at 5926 Sheila Street in the city of Commerce. CREF is a transformation facility that is permitted to accept up to 1,000 tons per day, not to exceed 2,800 tons per week. DART is located at 9770 Washburn Road in the city of Downey. DART is a materials recovery/transfer facility that is permitted to accept up to 5,000 tons per day. The South Gate Transfer Station is located at 9530 Garfield Avenue in the city of South Gate that is permitted to accept up to 1,000 tons per day of refuse. The PHMRF is located at 2808 Workman Mill Road in the city of Whittier. The PHMRF is permitted to accept 4,400 tons per day, not to exceed 24,000 tons per week of municipal solid waste. **C1-2 (cont)**

2. In regards to Table 4K-1 of the DEIR, please make the following corrections: **C1-3**

   a. Footnote *g*: Replace "Watershed" with "Wasteshed"

      Replace "Ordinance #4782" with "Ordinance #4780"

   b. Footnote *f*: Replace "Watershed" with "Wasteshed."

If you have additional questions concerning this response, please contact me at (562) 908-4288, extension 2764.

Very truly yours,

Stephen R. Maguin

Ziad A. El Jack
Senior Engineer
Planning Section

ZE:mh

LETTER NO. C1

Stephen Maguin, Chief Engineer
County Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, CA 90601-1400

RESPONSE NO. C1-1

This comment provides specific information on the County Sanitation Districts' facilities and service area. The commenter indicates that the closest landfill (owned and operated by the Districts) that could be used by the project is the Puente Hills Landfill. While this is the closest Districts' landfill, it is not the closest landfill to the project site. As discussed in Section 4.K, Solid Waste Disposal, of the Draft EIR, the closest landfills to the project site are Sunshine Canyon Landfill, Chiquita Canyon Landfill, and the Antelope Valley Landfill, where solid waste generated by the project would likely be disposed. Furthermore, although the Puente Hills Landfill could accept solid waste generated at the project site during the initial phases of occupancy, buildout of the project is anticipated to be 2017, after closure of the landfill. This information regarding the Puente Hills Landfill is presented in Table 4.K-1 of the Draft EIR. As shown therein, the permit expiration date for the Puente Hills landfill is October 31, 2013 according to the 2007 Los Angeles Countywide Integrated Waste Management Plan (May 2009), or, as stated by the Districts "disposal operations will continue until November 1, 2013." No additional response is required.

RESPONSE NO. C1-2

This comment provides additional information on waste-by-rail, refuse-to-energy, and other recycling options available to the project and is not a comment on the Draft EIR. Therefore, no additional response is required.

RESPONSE NO. C1-3

The typographical errors are noted. In response, Footnotes g and h of Table 4.K-1 have been revised. Please see Chapter 3.0, Corrections and additions to the Draft EIR, in this Final EIR.

Letter D1

From: Bernard Lee [mailto:leeb@scag.ca.gov]
Sent: Tuesday, September 15, 2009 1:24 PM
To: Bush, Michele
Subject: SCAG Comments on the DEIR for the Skyline Ranch Project

Dear Ms. Bush,

Attached are comments from the Southern California Association of Governments regarding the Draft Environmental Impact Report for the Skyline Ranch Project [I20090488]. **D1-1**

Please contact me if you have any questions or encounter difficulty opening the attachment.

Thank you,
Bernard

Bernard Lee
Southern California Association of Governments
Office: 213.236.1895
Email: leeb scag.ca.gov

Please consider the environment before printing this email.

SOUTHERN CALIFORNIA

ASSOCIATION of GOVERNMENTS

Main Office

818 West Seventh Street
12th Floor
Los Angeles, California
90017-3435

t (213) 236-1800
f (213) 236-1825

www.scag.ca.gov

Officers

President
Jon Edney, El Centro

First Vice President
Larry McCallon, Highland

Second Vice President
Pam O'Connor, Santa Monica

Immediate Past President
Richard Dixon, Lake Forest

Executive/Administration Committee Chair

Jon Edney, El Centro

Policy Committee Chairs

Community, Economic and Human Development
Carl Morehouse, Ventura

Energy & Environment
Keith Hanks, Azusa

Transportation
Mike Ten, South Pasadena

September 14, 2009

Ms. Michele Bush
County of Los Angeles
Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, CA 90012
mbush@planning.lacounty.gov

RE: SCAG Comments on the Draft Environmental Impact Report for the Skyline Ranch Project [I20090488]

Dear Ms. Bush,

Thank you for submitting the **Draft Environmental Impact Report for the Skyline Ranch Project, County Project No. 04-075 [I20090488]** to the Southern California Association of Governments (SCAG) for review and comment. SCAG is the authorized regional agency for Inter-Governmental Review of Programs proposed for federal financial assistance and direct development activities, pursuant to Presidential Executive Order 12372 (replacing A-95 Review). Additionally, pursuant to Public Resources Code Section 21083(d) SCAG reviews Environmental Impacts Reports of projects of regional significance for consistency with regional plans per the California Environmental Quality Act Guidelines, Sections 15125(d) and 15206(a)(1). SCAG is also the designated Regional Transportation Planning Agency and as such is responsible for both preparation of the Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP) under California Government Code Section 65080 and 65082. As the clearinghouse for regionally significant projects per Executive Order 12372, SCAG reviews the consistency of local plans, projects, and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies. **D1-2**

SCAG staff has reviewed this project and determined that the proposed project is regionally significant per California Environmental Quality Act (CEQA) Guidelines, Sections 15125 and/or 15206. The proposed project, located on 2,173 acres (of which 622 acres would be developed), would consist of 1,260 residential lots.

We have evaluated this project based on the policies of SCAG's Regional Transportation Plan (RTP) and Compass Growth Vision (CGV) that may be applicable to your project. The RTP and CGV can be found on the SCAG web site at: http://scag.ca.gov/igr. The attached detailed comments are meant to provide guidance for considering the proposed project within the context of our regional goals and policies. We also encourage the use of the SCAG List of Mitigation Measures extracted from the RTP to aid with demonstrating consistency with regional plans and policies. Please provide a copy of the Final Environmental Impact Report (FEIR) for our review. If you have any questions regarding the attached comments, please contact Bernard Lee at (213) 236-1800. Thank you.

Sincerely,

Jacob Lieb, Manager
Assessment, Housing & EIR

DOCS# 153232

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE SKYLINE RANCH PROJECT [SCAG NO. I20090488]

PROJECT LOCATION

The proposed project is located in the Santa Clarita Valley west of Sierra Highway, north of Highway 14 (Antelope Valley Freeway) and the City of Santa Clarita. The project site includes various undeveloped parcels west of Sierra Highway (Mint Canyon) between the Santa Clara River and Vasquez Canyon.

PROJECT DESCRIPTION

The proposed Skyline Ranch project site occupies approximately 2,173 acres. The project is a request to develop on approximately 622 acres of the site, which includes 1,313 lots consisting of 1,260 residential lots, an approximately 11-acre elementary school site, 10 lots for park areas, 13 debris basin lots, four (4) water tank/booster pump station lots and 25 open space lots. Nearly three quarters of the site (the northern 1,551 acres) is proposed to remain undeveloped, with approximately 1,355 acres dedicated or designated as open space through establishment of the proposed Skyline Ranch Conservation Area (SRCA). Approximately 166 acres of undeveloped land in the northern portion of the site on the Cruzan Mesa would remain undeveloped and designated as a Non-Development/Continuing Use Area. Also within the northern portion of the site approximately 22 acres would be preserved as a Mitigation Exchange Area for 22 acres of preserve area within adjacent recorded Tract 46018. The project includes a Conditional Use Permit application due to Density-Controlled Development and Hillside Management Areas; and an Oak Tree Permit for the removal of one oak tree.

The project site is undeveloped except for the northern portion, known as Cruzan Mesa, which is currently being leased by a film production company as an outdoor movie location. Portions of Cruzan Mesa have been previously used for cattle grazing and are the site of sizable vernal pools. Remnants of an old landing strip are still present on Cruzan Mesa; based on available historical information, this landing strip had been in operation from at least the late 1950s until the late 1980s. Also within the project boundary are seven parcels (or 60 acres) under private ownership, which are not a part of the proposed project. These include five vacant parcels and two parcels with one single-family unit each. These parcels are outside of the proposed development area and access to these parcels would not be affected by the proposed project. D1-3

Large portions of the project site, located to the north, lie adjacent to undeveloped lands. The southern portion of the project site, the portion designated for development, lies adjacent to or in the vicinity of existing urban development. Residential development in the City of Santa Clarita lies adjacent to the southernmost edge of the west side of the project site, with residential development continuing southward into the larger city area. A smaller residential tract is located to the southeast of the project site along Sierra Highway.

In particular, within the immediate vicinity of the location of the proposed connection of the new access road that would extend from Whites Canyon Road to Sierra Highway just north of Adon Avenue are several multi-family residential developments, motels, and daycare/preschool facilities. Sierra Highway extends southeast and northwest from its closest point to the project site with limited strip commercial uses interspersed with residential development and industrial uses further to the north. Soledad Canyon Road is located approximately one mile south of the project site and provides the nearest major commercial activities to the project site.

The following approvals are required for the project.

- Vesting Tentative Tract Map approval (for the development of 1260 residential lots) pursuant to Subdivision Code Subsections 21.38.010 through 21.38.080;

- Conditional Use Permit for Density-Controlled Development pursuant to Zoning Code Subsection 22.56.205 and Hillside Management Areas pursuant to Zoning Code Subsection 22.56.215;
- Oak Tree Permit (for removal of one oak tree) pursuant to Zoning Code Subsections 22.56.2050 through 22.56.2260;
- Approval to construct a 70-foot non-standard right-of-way within a local interior street;
- Other approvals, subsequent to discretionary approval, including those from the following agencies:
  - County Sanitation Districts of Los Angeles County (Sewer Line Connection Permit);
  - Los Angeles County Department of Public Works (Building Permit, Grading
- Permit, Improvement Plan Permit, General Municipal Separate Storm Sewer
- System Permit, Flood Control Easement);
  - Los Angeles County Fire Department (Approval of Alternative cul-de-sac/turnaround on Beneda Lane).

D1-3 Cont'd

CONSISTENCY WITH REGIONAL TRANSPORTATION PLAN

Regional Growth Forecasts

The Draft Environmental Impact Report (DEIR) should reflect the most current SCAG forecasts, which are the 2008 Regional Transportation Plan (RTP) Population, Household and Employment forecasts (adopted May 2008). The forecasts for your region, subregion, and county are as follows:

Adopted SCAG Regionwide Forecasts[1]

	2010	2015	2020	2025	2030	2035
Population	19,418,344	20,465,830	21,468,948	22,395,121	23,255,377	24,057,286
Households	6,086,986	6,474,074	6,840,328	7,156,645	7,449,484	7,710,722
Employment	8,349,453	8,811,406	9,183,029	9,546,773	9,913,376	10,287,125

Adopted NLAC Subregion Forecasts (Unincorporated)[1]

D1-4

	2010	2015	2020	2025	2030	2035
Population	194,704	244,463	294,120	342,578	389,595	434,773
Households	58,090	74,714	92,232	105,907	119,114	129,981
Employment	46,820	56,539	62,745	70,041	77,831	85,289

Adopted NLAC Subregion Forecasts (Total)[1]

	2010	2015	2020	2025	2030	2035
Population	719,989	839,942	960,006	1,076,970	1,190,463	1,299,449
Households	215,650	253,750	293,899	325,241	355,511	380,417
Employment	193,386	218,637	234,761	253,717	273,957	293,334

Adopted County of Los Angeles Forecasts (Unincorporated)[1]

	2010	2015	2020	2025	2030	2035
Population	1,188,321	1,282,624	1,378,396	1,471,608	1,561,983	1,648,694
Households	325,615	357,468	391,383	417,848	443,414	464,468
Employment	320,171	336,371	346,717	358,881	371,868	384,300

Adopted County of Los Angeles Forecasts (Total)[1]

	2010	2015	2020	2025	2030	2035
Population	10,615,732	10,971,598	11,329,832	11,678,549	12,015,885	12,338,619
Households	3,357,798	3,509,580	3,666,631	3,788,732	3,906,851	4,003,501
Employment	4,552,398	4,675,875	4,754,731	4,847,436	4,946,420	5,041,172

1. The 2008 RTP growth forecast at the regional, subregional, and county levels was adopted by the Regional Council in May 2008.

D1-4
Cont'd

SCAG Staff Comments:

Chapter 4.R (Population, Housing and Employment) utilizes the 2008 RTP forecasts. In order to derive values for years 2007 and 2017, the preparers of the EIR have interpolated.

The **2008 Regional Transportation Plan (RTP)** also has goals and policies that are pertinent to this proposed project. This RTP links the goal of sustaining mobility with the goals of fostering economic development, enhancing the environment, reducing energy consumption, promoting transportation-friendly development patterns, and encouraging fair and equitable access to residents affected by socio-economic, geographic and commercial limitations. The RTP continues to support all applicable federal and state laws in implementing the proposed project. Among the relevant goals and policies of the RTP are the following:

Regional Transportation Plan Goals:

RTP G1 *Maximize mobility and accessibility for all people and goods in the region.*
RTP G2 *Ensure travel safety and reliability for all people and goods in the region.*
RTP G3 *Preserve and ensure a sustainable regional transportation system.*
RTP G4 *Maximize the productivity of our transportation system.*
RTP G5 *Protect the environment, improve air quality and promote energy efficiency.*
RTP G6 *Encourage land use and growth patterns that complement our transportation investments.*
RTP G7 *Maximize the security of our transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies.*

D1-5

SCAG Staff Comments:

SCAG staff finds the project meets consistency with RTP G4 and partial consistency with RTP G1, G5, and G6. RTP G2, G3, and G7 are not applicable to this project.

The proposed project meets partial consistency with RTP G1. Mobility pertains to the speed at which one may travel and the delay, or difference between the actual travel time and travel time that would be experienced if a person traveled at the legal speed limit. Table 4.F-16 (ICU and LOS Summary with Mitigation) indicates that all analyzed intersections meet Level of Service (LOS) requirements (LOS E per page 4.F-10), after accounting for improvements. Accessibility measures how well the transportation system provides people access to opportunities, such as jobs, education, shopping, recreation, and medical care. The proposed project site is located approximately two miles north of Highway 14, slightly challenging access to the rest of the region. Local access is provided via Sierra Highway.

With regard to RTP G4, the proposed project meets consistency. Productivity is a system efficiency measure that reflects the degree to which the transportation system performs during peak demand conditions. As mentioned previously, analyzed intersections near the proposed project site would perform at acceptable Levels of Service.

The proposed project meets partial consistency with RTP G5. Per page 4.H-40, the proposed project's operation would exceed SCAQMD thresholds for five out of six criteria pollutants, after mitigation measures have been applied. Table 4.H-7 (Estimated Operational Emissions Without Mitigation) indicates that Mobile Sources contribute to emissions in a significant manner. However, pages 4.S-7 to 4.S-9 discuss the low impact development standards and green building programs that the project intends to implement. **D1-5** Cont'd

The proposed project meets partial consistency with RTP G6. The project site is located two miles from Highway 14, which provides regional access and is located near Sierra Highway, which provides local access. Pages 2-14 to 2-19 describe roadway improvements that will be required in order to provide sufficient access to the site. Three Santa Clarita Transit bus lines, operating on 30 minute headways, stop within a quarter mile of the project site.

GROWTH VISIONING

The fundamental goal of the **Compass Growth Visioning** effort is to make the SCAG region a better place to live, work and play for all residents regardless of race, ethnicity or income class. Thus, decisions regarding growth, transportation, land use, and economic development should be made to promote and sustain for future generations the region's mobility, livability and prosperity. The following "Regional Growth Principles" are proposed to provide a framework for local and regional decision making that improves the quality of life for all SCAG residents. Each principle is followed by a specific set of strategies intended to achieve this goal.

Principle 1: Improve mobility for all residents.

GV P1.1 *Encourage transportation investments and land use decisions that are mutually supportive.*
GV P1.2 *Locate new housing near existing jobs and new jobs near existing housing.*
GV P1.3 *Encourage transit-oriented development.*
GV P1.4 *Promote a variety of travel choices*

D1-6

SCAG Staff Comments:

Where applicable, the proposed project meets partial consistency with Growth Visioning Principle 1. GV P1.3 is not applicable since the project is not a transit-oriented development.

The proposed project meets partial consistency with GV P1.1. The project site has moderately reasonable regional and local access (via Highway 14 and Sierra Highway, respectively), but will require additional roadway extensions to effectively serve the project. Three bus lines currently run within a quarter mile of the site, but only operate on 30 minute headways.

SCAG staff cannot determine consistency with GV P1.2. The North Los Angeles County subregion lags the SCAG region overall, as it relates to jobs/housing balance.

The proposed project meets consistency with GV P1.4. In addition to autos, other modes (public transit, walking, and biking) have been accounted for in the project's objectives on page 2-5.

Principle 2: Foster livability in all communities.

GV P2.1 *Promote infill development and redevelopment to revitalize existing communities.*
GV P2.2 *Promote developments, which provide a mix of uses.*
GV P2.3 *Promote "people scaled," walkable communities.*
GV P2.4 *Support the preservation of stable, single-family neighborhoods.*

SCAG Staff Comments:

Where applicable, the proposed project meets partial consistency with Growth Visioning Principle 2. GV P2.4 is not applicable since there is not a single-family neighborhood on the project site.

SCAG staff cannot determine consistency with GV P2.1, as the existing site is largely undeveloped. **D1-7**

With regard to GV P2.2, SCAG staff cannot determine consistency, as the proposed project is almost exclusively residential.

The proposed project meets partial consistency with GV P2.3. One of the project objectives, listed on page 2-5, is to "Create a pedestrian friendly environment which encourages pedestrian access between neighborhoods, parks, and a public elementary school." However, the Mobility Objectives related to walkability seem to focus around pedestrian safety in the context of autos, as opposed to creating pedestrian-oriented environments.

Principle 3: Enable prosperity for all people.

GV P3.1 *Provide, in each community, a variety of housing types to meet the housing needs of all income levels.*
GV P3.2 *Support educational opportunities that promote balanced growth.*
GV P3.3 *Ensure environmental justice regardless of race, ethnicity or income class.*
GV P3.4 *Support local and state fiscal policies that encourage balanced growth*
GV P3.5 *Encourage civic engagement.* **D1-8**

SCAG Staff Comments:

Where applicable, SCAG staff is unable to assess the proposed project's consistency with Growth Visioning Principle 3, based on the content in the DEIR. GV P3.2 and 3.5 are not applicable.

Principle 4: Promote sustainability for future generations.

GV P4.1 *Preserve rural, agricultural, recreational, and environmentally sensitive areas*
GV P4.2 *Focus development in urban centers and existing cities.*
GV P4.3 *Develop strategies to accommodate growth that uses resources efficiently, eliminate pollution and significantly reduce waste.*
GV P4.4 *Utilize "green" development techniques*

SCAG Staff Comments:

D1-9

The project meets partial consistency with Growth Visioning Principle 4.

As mentioned previously, the proposed project would be built on land that is largely undeveloped. Therefore SCAG staff cannot determine consistency with GV P4.1.

With regard to GV P4.2, the proposed project meets partial consistency. While it is not in an existing city, the southern portion of the project site lies adjacent to urbanized areas, including

portions that are within the City of Santa Clarita.

The proposed project meets consistency with GV P4.3 and P4.4. Pages 4.S-7 to 4.S-9 discuss the Los Angeles County low impact development standards, drought-tolerant landscaping standards, and green building development standards. In addition, pages 4.S-25 to 4.S-27 discuss additional green building standards that would be implemented by the project applicant. **D1-9** Cont'd

CONCLUSION

Overall, the proposed project partially meets consistency with SCAG Regional Transportation Plan Goals and Growth Visioning Principles. **D1-10**

All feasible measures needed to mitigate any potentially negative regional impacts associated with the proposed project should be implemented and monitored, as required by CEQA. Refer to the SCAG List of Mitigation Measures for additional guidance, which may be found here:
http://www.scag.ca.gov/igr/documents/SCAG_IGRMMRP_2008.pdf

When a project is of statewide, regional, or areawide significance, transportation information generated by a required monitoring or reporting program shall be submitted to SCAG as such information becomes reasonably available, in accordance with CEQA, Public Resource Code Section 21018.7, and CEQA Guidelines Section 15097 (g). **D1-11**

LETTER NO. D1

Bernard Lee
Southern California Association of Governments
818 West Seventh Street, 12th Floor
Los Angeles, CA 90017-3435

RESPONSE NO. D1-1

This comment provides the transmittal for the letter. Responses to the referenced letter are presented in Responses to Comments D1-2 through D1-11 below.

RESPONSE NO. D1-2

This comment provides background on the role of SCAG as "the authorized regional agency for Inter-Governmental Review of … direct development activities;" and notes that the proposed project is a regionally significant project per CEQA guidelines. Submittal of this letter by SCAG provides evidence of SCAG review of the project EIR pursuant SCAG's role and obligations. This comment does not address the contents or adequacy of the Draft EIR.

RESPONSE NO. D1-3

The comment recites information regarding the characteristics of the proposed project that is included within the Draft EIR. This comment does not address the adequacy of the Draft EIR and therefore no further response is required.

RESPONSE NO. D1-4

The comment is noted. As indicated by the commenter, analysis presented in Section 4.R, Population, Housing and Employment of the Draft EIR, was based on population, housing and economic forecasts that are presented in the 2008 RTP and is therefore consistent with SCAG policies.

RESPONSE NO. D1-5

The comment is noted. The Draft EIR addresses the project's relationship to RTP goals and Growth Visioning Principles in Table 4.Q-1 on page 4.Q-18. That discussion notes certain

transportation and environmental features that are not identified by the commenter. While SCAG staff states that site access will be provided, the extension of Whites Canyon Road to Sierra Highway would also enhance the regional roadway network through a long planned regional roadway improvement contemplated in the Draft Los Angeles County Highway Plan. Furthermore, this roadway would also facilitate the extension of the Santa Clarita Transit (SCT) bus service to the project site, with more frequent service provided in response to ridership demand and as determined by the SCT. The applicant would provide fair share funds to Bouquet Canyon and Eastside B&T Districts, mitigating project traffic impacts and providing overall transportation improvements within the Santa Clarita Valley. In addition, the project design is favorable to the RTP goals by clustering development adjacent to existing development, and preserving more remote, environmentally sensitive parts of the project site.

The commenter acknowledges the project's environmentally protective features that are described on pages 4.S-7 to 4.S-9, in Section 4.S, Global Climate Change, of the Draft EIR such as those stated in the County's Drought-Tolerant Landscaping Ordinance, Green Building Ordinance, and Low Impact Development Standards Ordinance. Additional information regarding the implementation of environmentally protective features is provided on pages 4.S-25 through 4.S-29 of the Draft EIR. That discussion includes some provisions that are consistent with the intent of the Low Impact Development Standards Ordinance (even though the project is exempt from the ordinance) and also identifies LIVINGSMART program features that would be offered as a homebuyer option. The LIVINGSMART program identifies numerous building/materials/practices to reduce energy consumption, and support sustainable building practices, health enhancement and water conservation. These additional features would provide greater environmental protection than the features described on pages 4.S-7 to 4.S-9 of the Draft EIR and would suggest greater support for the RTP policies than identified by the commenter.

RESPONSE NO. D1-6

The comment is noted. The commenter refers to the project's need for additional roadway extensions but omits noting that such required roadways are being implemented as part of the project. As noted in Response to Comment D1-5 above, the project will construct the extension of Whites Canyon Road to Sierra Highway (as Skyline Ranch Road), enhancing the regional roadway network and facilitating the extension of the Santa Clarita Transit (SCT) bus service to the project site, with more frequent service provided in response to ridership demand and as determined by the SCT. Furthermore, the applicant would provide fair share funds to Bouquet Canyon and Eastside B&T Districts, mitigating project traffic impacts and providing overall transportation improvements within the Santa Clarita Valley. These contributions to mobility in the project area would suggest greater support for the Growth Visioning, Principle 1, than identified by the commenter. Also, the discussion of Principle 1 in Section 4.Q, Land Use, Table 4.Q-1, of the Draft EIR notes that the proposed lower density project is located outside of the Growth Visioning "2%" area that is

designated for higher density development; and therefore the proposed project would not adversely affect policies pertaining to SCAG efforts to increase density along transportation corridors and in high density activity centers.

RESPONSE NO. D1-7

The comment is noted. The commenter's statement regarding the amount of support for pedestrian-oriented activities, and that the project objectives seem to focus on pedestrian safety rather than creation of a pedestrian oriented environment, fails to note that the project includes a system of landscaped pathways, paseos, a pedestrian bridge, and bike lanes that encourage and support walking and bicycling to the school and parks located on the project site, and to offsite areas as well (as described in Chapter 2.0, Project Description of the Draft EIR). The school and parks are being provided within the project site to increase the range of uses and enhance livability. Furthermore, the project provides housing that would occur adjacent to existing housing and a proposed mixed-use development to the west. The proposed housing type associated with the project would be similar in mass, height, and density to the existing adjacent, residential development, thus supporting the stability of the existing single family neighborhoods. These contributions to mobility in the project area would suggest greater support for Growth Visioning, Principle 2, than identified in the comment. See also Chapter 3.0, Corrections and Additions, of this Final EIR, which incorporate the pedestrian bridge as a component of the project and no longer optional.

RESPONSE NO. D1-8

The comment is noted. As also noted in the discussion of Principle 3 in Section 4.Q, Land Use, Table 4.Q-1 of the Draft EIR, the project would provide a school site (over and above the customary school mitigation fees required under Senate Bill 50) and additional tax revenues that may be used by the County to enhance the community.

RESPONSE NO. D1-9

The comment is noted. Principle 4.1, for which SCAG did not reach a conclusion is served by the project design, which clusters development within the southern portion of the site to preserve or otherwise avoid development within the environmentally sensitive areas in the northern portion of the site and preserve portions of the site that are within the County's proposed Cruzan Mesa Vernal Pools SEA. In more specific terms, the project would set aside 1,551 acres of the site as open space and would establish the 1,335 acre Skyline Ranch Conservation Area (SRCA) to support the protection of biological resources in the area in perpetuity. See also Response to Comment D1-5 regarding environmentally protective features that address Principles 4.3 and 4.4.

RESPONSE NO. D1-10

The comment regarding project consistency with the SCAG RTP Goals and Growth Visioning Principles is a conclusion based on the previous comments. Responses to Comments D1-5 through D1-9 present additional project features and mitigation that support the relevant Goals and Principles identified by SCAG staff and are discussed in Sections 4.Q, Land Use and 4.S, Global Climate Change of the Draft EIR. These applicable project contributions would suggest greater support for the Goals and Principles than stated in the comment.

RESPONSE NO. D1-11

The comment is noted. The EIR analyzed the project's potential impacts and recommended mitigation measures to reduce identified impacts pursuant to the CEQA guidelines. These mitigation measures are specifically tailored to address the project's impacts, given it unique characteristics and environmental setting. Furthermore, a Mitigation Monitoring Program for implementation of the mitigation measures presented in the Draft EIR has been prepared pursuant to California Public Resources Code and Section 15097 of the CEQA guidelines and is included in Chapter 4.0 of this EIR.

Letter D2

City of
SANTA CLARITA

23920 Valencia Boulevard • Suite 300 • Santa Clarita, California 91355-2196
Phone: (661) 259-2489 • FAX: (661) 259-8125
www.santa-clarita.com

September 14, 2009

Ms. Michelle Bush
Principal Regional Planning Assistant
Impact Analysis Section
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Dear Ms. Bush:

Subject: DEIR Comments for VTTM 060922, Skyline Ranch – Pedestrian Crossing for School/Park

The City has reviewed the above-referenced EIR and as determined that the document adequately addresses project impacts, mitigation measures and project alternatives. However, there is one portion of the DEIR which we believe warrants further analysis and mitigation. D2-1

The pedestrian safety discussion on page 4.F-44 of the DEIR notes that pedestrian safety at the intersection of Skyline Ranch Road and Main Street South, in the vicinity of the school site, would be provided by, "fully improved streets with full width sidewalks," and that children crossing Skyline Ranch Road at the school site would be able to use "the traffic signal adjacent to the school." It should be noted that there is no signalized intersection depicted on the tentative tract map for this location, nor are there any mitigation measures proposed in the DEIR which would require installation of a traffic signal at this intersection. Page 4.F-45 of the DEIR goes on to state that "the plan includes all feasible measures to ensure a high level of pedestrian safety" and then stops short of specifying any actual pedestrian safety mitigation measures which must be implemented in order to mitigate potential pedestrian safety impacts.

The City has a concern with pedestrian safety for both school children and other future residents who would be accessing the school site, the park site and the bike paths and trails at this intersection. The applicant's proposal illustrated in Figure 2-8 of the DEIR (pages 2-16), addresses this concern through the use of a strategically located pedestrian bridge and a series of off-street paseos and a stairway which provides off-street linkages to the school site, the park site, the central bike paths and the community on the east side of Skyline Ranch Road. We believe this overall concept would effectively address the project's overall pedestrian safety impact; however, the DEIR contains no mitigation measures requiring these pedestrian improvements and the project application has recently been amended to describe construction of the pedestrian bridge as "optional" to be paid for and constructed at the discretion of the school district. The school district would likely be unable to expend school funds for an improvement which would benefit the entire Skyline development. We therefore believe inclusion of a mitigation measure requiring the subdivider to construct the pedestrian bridge and paseo improvements as illustrated in EIR Exhibit 2-8 prior to the occupancy of the first unit on the northeast side of Skyline Ranch Road is necessary in order to mitigation potential pedestrian safety impacts. D2-2

Thank you for the opportunity to comment on the DEIR. Should you have any questions, or would like to discuss our comments; you may contact Associate Planner David Koontz, AICP, at 661-255-4330 or by email at dkoontz@santa-clarita.com.

Sincerely,

Sharon Sorensen

Sharon Sorensen
Senior Planner

SS:DK:kb
S:\CD\CURRENT\IRP\IRP FILES\VTTM 60922 (Skyline Ranch)\rttm60922 Bush 9-13-09.doc

Attachment

cc: Paul Novak, 5th District Planning Deputy
Susan Tae, Supervising Regional Planner
James Bizelle, Pardee Homes
Lisa Webber, Planning Manager
Sharon Sorensen, Senior Planner
David Koontz, Associate Planner
Andrew Yi, City Traffic Engineer

LETTER NO. D2

Sharon Sorenson
Senior Planner
City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, California 91355-2196

RESPONSE NO. D2-1

The comment is noted.

RESPONSE NO. D2-2

In response to the concerns expressed by the commenter, the pedestrian bridge, stairway, and paseo improvements shown on Figure 2-8 of the Draft EIR will be incorporated as a component of the project and are no longer designated as optional. Construction of these improvements would occur prior to the occupancy of the first unit on the northeast side of Skyline Ranch Road and would become a condition of project approval. As this feature is now incorporated into the project and as the analysis provided on page 4.F-45, in Section 4.F, Traffic/Access of the Draft EIR, concluded that pedestrian safety impacts would be less than significant pending the development of a detailed site plan by the Sulphur Springs Union School District, no mitigation measures are proposed. Please refer to Chapter 3.0, Corrections and Additions to the Draft EIR, in this Final EIR.

Letter D3

From: Gordon Mize [mailto:gmize@aqmd.gov]
Sent: Wednesday, September 16, 2009 1:14 PM
To: Bush, Michele
Cc: James Koizumi
Subject: Draft EIR for the Proposed Skyline Ranch Project

Ms. Michele Bush, Impact Analysis Section
County of Los Angeles, Department of Regional Planning

Re: Draft EIR for the Proposed Skyline Ranch Project

I realize that the public comment period closed on September 14, 2009 but I would still like to review the health risk assessment and localized significance threshold analyses for this Draft EIS EIR document. In order to do this, I would like to request that the following electronic files be sent to my colleague, Mr. James Koizumi, Air Quality Specialist, for review. Please send all of the electronic files, such as spreadsheets or databases used to estimate health risk in the HRA (Appendix D, ISCST3 Dispersion Modeling Files, etc.). These electronic files are needed in order to verify that the impacts of the HRA. In addition, please send the electronic files for any localized significance thresholds analysis performed. These modeling files should be in their native electronic state. Please forward these files to Mr. Koizumi, Air Quality Specialist, at jkoizumi aqmd.gov . Comments for this document were due on Monday, September 14th. **D3-1**

If you have any questions regarding this request please contact Mr. Koizumi at (909) 396-3324 or myself.

Thank you.

Gordon Mize

Gordon E. Mize
Air Quality Specialist
South Coast Air Quality Management District
CEQA Section
(909) 396-3302 phone
(909) 396-3324 fax

LETTER NO. D3

Gordon E. Mize
Air Quality Specialist
South Coast Air Quality Management District
CEQA Section
21865 Copley Drive
Diamond Bar, CA 91765-4178

RESPONSE NO. D3-1

Although this request was received after the close of the public comment period on the Draft EIR, the requested electronic files were provided by the County to SCAQMD for their review. No additional comments were received from SCAQMD.

Letter E1

From: Katherine Squires [mailto:kat_268@att.net]
Sent: Monday, September 14, 2009 4:46 PM
To: Bush, Michele
Subject: Skyline Ranch DEIR Comments

Hello,

The attached files include the Sierra Club's DEIR comment letter for the proposed Skyline Ranch project along with several additional attachments. **E1-1**

Thank you,

Katherine Squires
Conservation Chair
Santa Clarita Sierra Club

3435 Wilshire Boulevard
Suite 320
Los Angeles, CA 90010-1904

SIERRA CLUB
FOUNDED 1892

(213) 387-6528 phone
(213) 387-5383 fax
www.sierraclub.org

September 12, 2009

Michele Bush
County of Los Angeles Dept. of Regional Planning
Impact Analysis Section
Room 1348
320 West Temple Street
Los Angeles, CA 90012

TITLE
Skyline Ranch Project No, 04-075

COMMENTS

As both residents of the Santa Clarita Valley and members of the Sierra Club, we are extremely concerned about the ramifications of the "Skyline Ranch Project." The proposed build-out of 1260 residential lots within the city of Santa Clarita is shocking when one considers the economic, environmental, and societal pressures of the times. The proposed Skyline Ranch project will substantially degrade the quality of the environment in northern Los Angeles County. **E1-2**

A recent trend of development corporations consists of attempts (and many have been successful) to redefine southern California by creating new developments in the midst of our most beautiful remaining open spaces. The proposed Skyline Ranch development area is one of these open spaces. It is situated in the heart of the city of Santa Clarita Valley. **E1-3**

- <u>Infrastructure</u>

Since year 2007, California has not needed thousands of new homes especially in newer towns such as Santa Clarita. If anything, people should be moving into homes in more urban areas where there are more jobs, public transportation, etc. Foreclosures, bankruptcies, and losses of adequately paying jobs have resulted in a surplus of unoccupied homes; including new homes. Many new homes and small businesses in the Santa Clarita Valley remain uncompleted and/or empty because of the recession, a sick economy, state and federal deficits, and a long-term lack of demand for more new homes. California has the worse debt and economy of any state in the country. Citizens have lost much income and savings over the last year and the project may soon be asking them to spend and buy in an isolated, remote area. **E1-4**

Due to the troubling economic times, many schools in the Santa Clarita Valley have seen a huge drop in enrollment and thus have lost state A.D.A. monies in addition to the extremely detrimental budget cuts coming from both the state and federal government. This has meant that local school districts have had to halt the building of new schools, increase class-sizes, and have either pink-slipped and or let-go of qualified teachers. How would a new development of over a thousand new homes make any of these problems better? **E1-5**

- Biology

Skyline Ranch is a wildlife linkage corridor and the animals that exist on or utilize the property will be losing their habitat and foraging grounds. Native habitat will be destroyed and many of the few pockets of open space will be just that, "islands" within the development. How will this be of any use to the animal species that frequent this wildlife corridor? This makes no sense. Animals that transition through the area (looking for food and water, etc.) will have nowhere to go. If allowed to be built, this project would sever the natural transition zones in the area prohibiting animals from crossing through necessary wildlife corridors. It would also destroy portions of an irreplaceable eco-region. **E1-6**

There are numerous significant impacts to coyotes, owls, toads etc…(many rare species who in many cases are already declining in numbers). However, the impacts always seem to be mitigated to non-significant levels by such things as: monitoring of property by a qualified biologist, relocation of animals, and/or limitations on human and pet access. We ask who the biologist would be? How often would the biologist be checking the property? Is he/she going to walk in front of the bulldozers to see if toads are about to be squished? Where would these animals be relocated to? How would relocating an animal(s) effect the biology of the relocation area and its native species? How can the limiting of human and pet access be enforced? **E1-7**

In other words, what the DEIR promises in mitigations for endangered or rare species is basically not possible.

One such example of an animal species in peril is that of the Black-tailed jackrabbit:

> Years ago, one of our Sierra Club members, Don Mullally, was one of a group of people allowed on the land of the proposed project by Newhall Land and Farm to examine natural features and conditions. He was surprised to discover jackrabbits on land proposed for the housing project.
>
> Apparently the hares existed on the part of the project located near the river due to much relatively level and gently sloping open land supporting brush, grasses, and herbs. Steep slopes of the Santa Susana Mountains with woodlands located a short distance south of the project are not inhabited by jackrabbits. In fact, jackrabbits have never been observed by myself or associates on the steep slopes and their canyons in the middle and upper parts of the Santa Susana Mountain **E1-8**

Range of Los Angeles County. Similarly, equivalent parts of the Santa Monica Mountains, San Gabriel Mountains, and Verdugo Mountains are also devoid of jackrabbits. Tongues of large valleys such as the San Fernando Valley extend into foothill canyons were formerly habitat for jackrabbits. However, for the most part those have been developed, and jackrabbits are now absent from them.

Jackrabbits were formerly common in all the large valleys of southern California. Don Mullally knows this because he observed the animals. Unfortunately, the California Department of Fish and Game, the Army Corps of Engineers, and the United States Fish and Wildlife Service, and the systems of state and county parks stood by doing nothing while the jackrabbits went extinct in the Santa Clarita Valley, San Fernando Valley, Los Angeles Basin, and the San Gabriel Valley. A few may continue to survive in the low hills and canyons on the northern side of the Simi Valley and in undeveloped locations in valleys east of San Gabriel Valley. The once hare-infested area of Cucamonga also seems to now be devoid of jackrabbits. **E1-8** Cont'd

Presently the question is – What will be the fate of the jackrabbits on and near the Skyline Ranch project? How far will the people of the Los Angeles greater area need to travel to see a common jackrabbit? Incidentally, the collapse of the noted populations of jackrabbits led to the disappearance of Golden eagles in the Los Angeles Basin and greater area.

As mentioned above, the proposed project would result in the loss of suitable foraging habitat for a variety of species (including mammals such as mountain lions/mule deer, birds such as condors/raptors, reptiles, amphibians, etc.), and the direct loss of special status plant species. It is easy to see that the impacts on animal and plant species will be drastic. **E1-9**

However, the DEIR is very inconsistent when describing potential mitigation measures and other solutions to the problem. When mitigation measures are mentioned they are weak or vague. Case in point, the DEIR states repeatedly that the effects of development will be significant and ultimately unavoidable.

Also, for some reason the County allowed a destructive filming operation on the sensitive Cruzon Mesa, currently proposed for Significant Ecological Area (SEA) designation. This area contained habitat that supported the endangered fairy shrimp, inhabitants of rare California vernal pools such as that found in the Cruzan Mesa. A recent and destructive wildfire was also allowed to burn through this area. CEQA requires that investigation of biological resources must be reviewed on a baseline prior to destruction of native habitat. We believe that this DEIR is inadequate because it does not use the proper baseline biological surveys in the DEIR **E1-10**

Stating that the impacts to wildlife are unavoidable is not acceptable and the mitigation measures suggested are not enough.

- Traffic

People inhabiting the homes potentially created by the Skyline Ranch Development Plan will, for the most part, probably have employment at well paying jobs in distant cities. Each day many thousands of workers and their automobiles will be leaving or returning to the town from these cities. This proposed development will bring thousands of additional car trips a day onto our freeways and surface streets and increase air pollution which is already some of the worst in the nation. Despite the claims of local developers to the contrary, most people who buy homes in the proposed development will simply not be able to work and live in the same community. Jobs in the service sector of local small towns will not yield sufficiently high salaries and wages to meet monthly house payments and other necessary costs. All highways leading to big cities offering high wages will become more crowded with automobiles than they are at present. Traffic congestion was much worse before the poor economy and recession. Traffic on surface streets and along Interstate 5, Highway 14, and along Sierra Highway could become literally unbearable. New homes are not the answer to the needs and wishes of the people living in Santa Clarita Valley and neighboring areas. Traffic congestion is a major concern of the residents of the surrounding areas. **E1-11**

- Air Quality

Another serious concern with the DEIR is the substantial effect the proposed development would have on the worsening air quality that we have in our area. It is obvious that the cumulative air pollutant emissions in the area would contribute to the degradation of local and regional air quality. The Santa Clarita Valley already has some of the worst air quality in the nation. Katherine Squires, a local teacher, sees the effects of poor air quality on the children in her Canyon Country classroom. Each year she sees more and more students who suffer from asthma. The SCV already exceeds Federal air pollution standards for particulate matter generated from dust and diesel pollution. **E1-12**

In addition, there would be long term effects resulting from the additional traffic on our local roads and freeways. Climatologists agree that greenhouse gases are causing global warming and even the Supreme Court, in its decision several months ago, said that EPA must address Carbon Dioxide as a pollutant. These two facts alone suggest that further discussion of global warming should appear in this DEIR. **E1-13** The project should not be approved without making public transportation available to its future residents. **E1-14**

- Geology and Paleontology **E1-15**

The proposed development is situated in an area prone to extreme tectonic activity (at the same rate of uplift as that which created the Himalaya Mountains). The area is in a regional setting of demonstrable high seismic risk. Consider the aftermath of a major earthquake on the people that could potentially reside in the proposed 1260 units. **E1-15** Cont'd

It is challenging for the reader to be more specific about the geology and paleontology of the area because the property has historically been off-limits to researchers and scientists. Such individuals have been denied access. Therefore, it is necessary to consult the few papers that discuss the area on and adjacent to the property (from many years ago). Past research demonstrates the fact that the site has important and rare megafauna including vertebrate remains of: camels, horses, antelopes, rhinos, and various carnivores. More research needs to be done before evaluating the "significance" of this project's ramifications.

This rich diversity of megafauna from the Late Miocene/Early Pleistocene (5-6 Million years old) can yield valuable information about paleoclimate, biostratigraphy, and chronostratigraphy. Unfortunately, it is hard to be specific about the Soledad Basin area's non-marine resources because paleontologic knowledge of this stratigraphic unit in the proposed project area has been severely hampered by the land owner's long-standing policy that forbids any research that might jeopardize their development plans. This lockout of research has also hampered detailed stratigraphic analysis of the nonmarine Mint and Saugus Formations in the critical area of the proposed development. **E1-16**

As their scientific tools improve with time, stratigraphic sections like the one proposed will be invaluable. This is the developers opportunity to leave a legacy that demonstrates they are a progressive corporation, much like the Tejon Ranch owners of the newly approved Tejon Ranch projects.

The paleontologic part of the DEIR is riddled with redundant and generalized non-informative statements. Details are sorely lacking, and these details are definitely needed before the merits of the DEIR can be determined by the readers of this document. It is extremely self-serving to mention the rich diversity of fossils in the various stratigraphic units and then to provide no details because independent researchers have been denied access to the area for decades.

The proposed project is excessively massive, and the impact on the geological and paleontological resources are permanent and unforgiving. Every effort must be made to preserve as much pristine area as possible.

Where will the fossils that are found during grading be stored? The developer should pay for the storage space and storage cabinets needed to house the fossils found on the site. Storage cabinets could be placed at the Natural History Museum of Los Angeles County. But of course, the question remains, has the Natural History Museum of Los Angeles County been contacted about receiving the material? Do they, in fact, have the space? **E1-17**

Additionally, there needs to be a guarantee that the paleo-monitors have a degree in geology and have had a course in paleontology/paleontology lab whereby they have learned to recognize invertebrate fossils. Hiring untrained paleo-monitors who have never had a course in the identification of invertebrate fossils would be unacceptable. **E1-18**

- Green Building Standards

The Sierra Club requests that green building standards be included as conditions of any approval that might be considered. **E1-19**

- Fire Hazard

This project is in an extremely high fire hazard zone. It was recently burned over by a destructive arson fire pushed by Santa Ana winds that burned 38,000 acres. Had this fire occurred after this project was built, many homes would have been lost.

The Sierra Club opposes further sprawl projects in the urban interface that are indefensible from wildfires. Such projects will cost enormous amounts of taxpayer dollars to fight future wildfires. Project approvals in high fire hazard zones should require, at the least, additional mitigation funding for fire fighting so that this burden is not placed on tax payers at a later date. **E1-20**

Further, there is inadequate fire service for this project and inadequate ingress and egress to provide swift emergency service and evacuation for residents. **E1-21**

- Water Resources

The area in which this project is located does not have sufficient ground water to support additional housing.[1] Therefore water to serve this project must come from the State Water Project (SWP) or the western reaches of the Santa Clara River. **E1-22**

The Water Supply Assessment (WSA) for the project does not include the recent Federal Court decisions and Biological Opinions that have reduced pumping from the Sacramento Delta[2], and thus reduced water availability to the SWP. A new Water Supply Assessment that includes the impact of reduced pumping required by these decisions must be included in the review of this project to determine whether the water supply is adequate to support the project. **E1-23**

---

[1] See well graphs available through Santa Clarita Water Co.

[2] *Natural Resources Defense Council v Kempthorne*, 506 F.Supp.2d 322 (E.D. Cal. 2007) (*Wanger* Decision - Delta smelt); and *Pacific Coast Federation of Fishermen's Associations, et al. v. Gutierrez, et al.*, No. 06-CV-00245-OWW-GSA (E.D. Cal. 2008) (*Wanger* Decision - Chinook salmon/steelhead.

Should cutbacks of state water supply continue, the only source of sufficient ground water is in the western end of the Santa Clarita Valley[3]. The Santa Clara River is not adjudicated, so this water is available to the project, however extensive piping and pumps must be installed to make it available to locations in the eastern portion of the Santa Clarita Valley. **E1-24**

Water in the western reaches of the Santa Clara River is currently also being considered for use by Newhall Ranch. Both projects cannot be supported by this water supply. A cumulative analysis must be conducted as required by CEQA and the SB610 to ensure an adequate water supply. **E1-25**

Ammonium Perchlorate Pollution

In 1997 ammonium perchlorate contamination was discovered in the Saugus and alluvial aquifers of the Santa Clarita Valley. Since that time, six municipal drinking water wells have been closed down[4], some of them permanently. Since the Saugus Aquifer is the drinking water supply long depended on in Santa Clarita as the emergency drought back up as well as a major source of daily supply, its contamination has been a blow to the reliability of local water supplies.

Ammonium perchlorate pollution affects the function of the thyroid gland causing hypothyroidism. Reduced thyroid function in pregnant women may cause retardation in the fetus.

In 2000 the Castaic Lake Water Agency (CLWA) and other local purveyors filed litigation against the Whittiker Bermite project to force them to clean up the water supply or pay for the clean up. Several years later a settlement agreement was reached that provided for funding to clean up two of the Saugus wells polluted by this contamination and one of the Alluvial wells. **E1-26**

In 2004, the Sierra Club and Friends of the Santa Clara River won an appellate court decision requiring disclosure of the ammonium perchlorate pollution and requiring a time line for the clean up in CLWA's Urban Water Management Plan[5].

Since then the Sierra Club has remained concerned that the facilities to provide this clean up continue to be delayed while thousands of additional housing units are approved. These facilities are still not operating as of the date of this letter.

In addition to these delays, it was previously represented that the two wells designated to provide "capture" and clean up of the ammonium perchlorate (Saugus Well 1 and 2) would be returned to their previous production levels. However, CLWA found that production was significantly reduced by 50%in those two wells by the clean up process.[6] **E1-27**

---

[3] Groundwater Basin Yield, 2008, Ludhdroff and Scalmanini and GSI Solutions, Inc., 2009, hereby included by reference in this administrative record.

[4] Stadium Well, Valencia Well Q2, Valencia Well 157, Saugus 1 and 2, NCWD 11

[5] *Friends of the Santa Clara River v. Castaic Lake Water Agency et al*., 2004, CalAp5

[6] See attached chart of Saugus Well Production Chart

Due to these significant delays and reductions in water supply, the Angeles Chapter of the Sierra Club passed a resolution[7] calling for the halt to housing approvals until the ammonium perchlorate treatment facilities are functioning to provide the community with its E1-28

Conclusion for Water Section

The Santa Clarita Water Co. is wholly owned by Castaic Lake Water Agency. It is in the interests of CLWA to promote projects that will buy additional state water project water from CLWA, the state water wholesaler for the Santa Clarita Valley. This fact creates a conflict of interest. We believe an independent source should provide the water supply information for this company's projects in order to ensure their accuracy. All agencies should carefully review the water supply information for errors or omissions.

The Sierra Club believes a monopoly control that does not separate the retailer from the wholesaler of water supply may create serious problems for our community. The potential unwanted outcome may lead to poor planning, direction of water resources to only certain projects or water hoarding that impedes communities in their efforts to fairly distribute this precious resource. Such serious ethical issues should be held in mind as this project is reviewed and addressed by the decision-makers. E1-29

Attachments:

1.Saugus Well Production Chart from information provided by Castaic Lake Water Agency

2.Sierra Club Resolution 7-23-06

CONCLUSION

E1-30

The Sierra Club is concerned that if the proposed Skyline Ranch development plan succeeds with county government, the entire region in the heart of the Santa Clarita Valley will become nearly continuous urban and suburban development. E1-31 The water situation could become unbelievably serious. E1-32 Furthermore, many of the values of southern California will be forever lost (scenic open spaces, habitat for wildlife, and a rich variety of fossil resources etc.). The Skyline Ranch development plan could set in place a dangerous precedent. The National Sierra Club has a policy against urban sprawl projects such as this one due to their unsustainability and wasteful use of resources. E1-33 It is requested that mitigation (including green building standards, a corridor for wildlife movement and public transportation for commuters that will live in the project) be provided that would reduce the disclosed impacts.

[7] Resolution approved 7-23-06, attached

At this time the Sierra Club favors the development alternative. We want to ensure reduced density and to be guaranteed that our environmental concerns (lack of water and infrastructure, traffic, air quality, and wildlife corridors, etc.) are sufficiently addressed. **E1-34**

Sincerely,

Katherine Squires

Conservation Chair, Santa Clarita Group

Saugus Formation Wells Actions

Well	Lost Capacity (gpm)	Action Taken	Restored Capacity (gpm)
V-157	1,500	Replaced with Well V-206	1,500
NC-11	1,200	Taken out of service	0
Saugus 1	2,600	Rehabilitate well; install treatment	1,200
Saugus 2	2,600	Rehabilitate well; install treatment	1,200
Total	7,900		3,900

3435 Wilshire Boulevard
Suite 320
Los Angeles, CA 90010-1904

SIERRA CLUB
FOUNDED 1892

(213) 387-6528 phone
(213) 387-5383 fax
www.sierraclub.org

Resolution of the Executive Committee of the Angeles Chapter

The Angeles Chapter opposes additional land use approvals in Santa Clarita that rely on water from the contaminated Saugus aquifer until clean up facilities to remove the ammonium perchlorate, NDMA and other pollutants from this ground water source are functioning.

E1-36

Approved unanimously
7-23-06

LETTER NO. E1

Katherine Squires
Conservation Chair
Santa Clarita Sierra Club
3435 Wilshire Boulevard, Suite 320.
Los Angeles, CA 90010-1904

RESPONSE NO. E1-1

This comment provides the transmittal for the letter. Responses to the referenced letter are presented in Responses to Comments E1-1 through E1-36, below.

RESPONSE NO. E1-2

The comment is noted for the consideration of the decision-makers. The Draft EIR for the project has been prepared pursuant the CEQA guidelines and addresses the project impacts on the physical environment. It evaluates project impacts on 19 environmental topics determined in the Initial Study and based on recent public concern about greenhouse gas emissions and global climate change to be potentially significant. Chapter 4.0, Environmental Impact Analysis of the Draft EIR, evaluated project impacts, identified mitigation measures to reduce project impacts, and identified significant unavoidable impacts that would remain after the implementation of mitigation measures. The Draft EIR, using conservative assumptions, identified the following potentially significant, unavoidable impacts on the environment: visual impacts associated with construction activities and changes in views from the existing residential neighborhood to the west; cumulative traffic impacts on Highway 14 from Sand Canyon Road to south of the Sierra Highway interchange; noise due to construction and off-site mobile sources; air quality due to construction and project operations; cumulative solid waste; law enforcement; and cumulative global climate change. The project is not located within the City of Santa Clarita as stated by the commenter, but is located within unincorporated Los Angeles County, adjacent to the City of Santa Clarita. Regarding the commenter's alarm at the size of the project in light of economic, environmental and societal pressures, it should be noted as stated on page 6-4 in Chapter 6.0, Other CEQA Considerations of the Draft EIR, that the increase in housing and population associated with the project is within growth forecasts for the area and represents a relatively small component of expected growth. As also stated in Chapter 6 of the Draft EIR, the proposed project would not exacerbate economic pressures. Rather, it would result in economic growth through job creation and annually-recurring revenue in the form of taxes and other fees (e.g., sales tax, property tax, utility fees, etc.).

RESPONSE NO. E1-3

The comment does not address the contents or adequacy of the Draft EIR; however the comment is noted for consideration by the decision-makers. The Draft EIR analyzed project impacts on open space in several sections including Sections 4.C, Biological Resources and 4.Q, Land Use. As described within those sections, nearly 1,551 acres in the northern portion of the site would remain undeveloped, including the establishment of a 1,355-acre Skyline Ranch Conservation Area (SRCA) and 166-acre Non-Development/Continuing Use Area. As described on page 2-33 and 2-34, in Chapter 2.0, Project Description, of the Draft EIR, the SRCA would have an ongoing maintenance and management program for the long-term persistence of the property's biological resources and the Non-Development/Continuing Use Area would remain undeveloped with restrictions placed on the use of the land to prevent buildings from being established in this area. Therefore, development of a previously approved 200 unit subdivision, located in the northern portion of the site and within the SRCA and Non-Development/Continuing Use Area, would not occur. The result of these project features would be to provide development contiguous to existing development in the southern portion of the site, in contrast to the previously approved, noncontiguous development location out amid the larger open space area. The proposed project would leave a large contiguous area of open space leading up to the Angeles National Forest. The establishment of the SRCA and Non-Development Continuous Use Area would protect the Cruzan Mesa Vernal Pool area, currently proposed by the County as a Significant Ecological Area. Overall, the proposed project would not redefine land use patterns but rather is consistent with the Countywide General Plan, Santa Clarita Valley Area Plan, and zoning regulations and concentrates residential uses next to existing residential development.

RESPONSE NO. E1-4

The comment does not address the contents or adequacy of the Draft EIR; however the comment is noted for consideration by the decision-makers. The Draft EIR discussed development trends and housing needs, inclusive of population, housing and employment projections, in Section 4.R, Population, Housing and Employment of the Draft EIR. As described therein, SCAG is mandated by State Housing Law to prepare a Regional Housing Needs Assessment (RHNA). The current RHNA quantifies the need for housing within each jurisdiction in the region for the January 1, 2006 to June 30, 2014 period. The RHNA takes into account overall growth demand as well as development distribution in the region, in light of SCAG policies to improve mobility and foster livability and sustainability. According to the RHNA, there is a need for 73,352 new dwelling units in the North Los Angeles County Subregion between January 1, 2006 and June 30, 2014.

By law, the County must use the RHNA for preparing a General Plan Housing Element, planning for future growth, and establishing policies, procedures and incentives in its land use

planning and redevelopment activities that will result in the maintenance and expansion of the housing supply to adequately house households currently living and expected to live in the County. While housing projections may vary from year to year depending on short-term cycles in market conditions, such variation tends to average out over longer durations such as those addressed in the RHNA. Furthermore, short-term variations in growth tend to be addressed by market forces which adjust to changing conditions regarding housing supply and demand. It should be noted that the development is not isolated and remote as suggested by the commenter, but is located immediately adjacent to residential uses within the City of Santa Clarita.

RESPONSE NO. E1-5

The comment regarding development and the provision of schools is noted for the consideration of the decision-makers. Project effects on schools are addressed in Section 4.N, Education of the Draft EIR. As indicated in that analysis, the project would be required to pay developer fees under the provisions of Senate Bill 50 (SB 50) which is considered full and complete mitigation that would reduce project impacts to a less than significant level. In addition to the payment of fees, the proposed project includes the voluntary provision of an elementary school site to the Sulphur Springs School District for the development of a new school. Provision of the school site is fully supported and considered appropriate by the Sulphur Springs School District.

RESPONSE NO. E1-6

The Draft EIR addressed biological resources in Section 4.C, Biological Resources with supporting data provided in Appendix D of the Draft EIR. Specifically, the Draft EIR evaluated the project area to determine the extent of any wildlife linkage corridors in the project vicinity on page 4.C-23 and addressed the project's potential impacts on wildlife corridors on page 4.C-63. As indicated in the Draft EIR, the projects site (1) does not serve as a component of a significant regional wildlife movement corridor per se, (2) does not serve as a linkage between two or more larger habitat areas, and (3) is near but outside of any missing linkages in the San Gabriel Mountains/Castaic area according to the publication *Missing Linkages: Restoring Connectivity to the California Landscape*, a collaborative project undertaking by the University of Wisconsin, The Nature Conservancy, California Wilderness Coalition, Talon Associates, and South Coast Wildlands (November 2, 2000). The project site is linked to the Angeles National Forest through Vasquez Canyon to the north. Proposed development would be located within the southern portion of the project site. Nearly three quarters of the project site, or approximately 1,551 acres would remain undeveloped and therefore, would provide a large contiguous open space area (rather than isolated pockets as suggested by the commenter) that would continue to foster wildlife movement between areas of the Angeles National Forest to the north and west (i.e. Lake Hughes, San Fancisquito Canyon, Bouquet Canyon) and areas to the east and south (i.e., Placerita Canyon State

Park, Tujunga Wash). Furthermore, establishment of the SRCA by the project would support establishment of the proposed Cruzan Mesa Significant Ecological Area.

RESPONSE NO. E1-7

This comment does not directly address the project's proposed mitigation measures, which are presented on pages 4.C-71 through 4.C-77 of the Draft EIR and would be implemented through the provisions of a Mitigation Monitoring Program (MMP) as described in Chapter 4.0 of this Final EIR. Mitigation Measure 4.C-1 addresses the establishment of a 1,355-acre Skyline Ranch Conservation Area (SRCA); sets performance standards for the area and lays out management and funding responsibilities. Mitigation Measure 4.C-2 provides for implementation of a Habitat Mitigation and Monitoring Plan (HMMP) that preserves the 1,355 acre conservation area, requires the preservation of 1.53 acres of southern vernal pool and artificial pool habitats that are subject to RWQCB jurisdiction, and requires the establishment of 7.27 acres of sycamore/cottonwood riparian woodland within Plum Canyon. The measure sets out specific criteria and standards for the implementation of the HMMP. Mitigation Measure 4.C-3 addresses potential impacts to nesting birds protected by the Migratory Bird Treaty Act. It requires that a biologist, qualified according to federal and State resource agency standards (because they typically include these same requirements as conditions of their permits) be present during vegetation clearing to search for and flag active nests and protect impacts to nesting birds. This is a feasible activity, one requiring the biologist to be present ahead of the grading activities, and one implemented regularly per the Migratory Bird Treaty Act. Mitigation Measure 4.C-4 requires tree planting with specific performance requirements. Mitigation Measure 4.C-5 requires the use of native plant species adjacent to the open space areas. With regard to control of humans and pets adjacent to the open space areas, the potential impacts have been addressed on pages 4.C-70 through 4.C-72 of the Draft EIR. As indicated therein, the existing topography acts as a barrier that limits potential intrusion into the open space areas, and the project would include fencing and signage to further control access. Furthermore, Mitigation Measure 4.C-1 includes performance standards that specify in part that: "An on-going maintenance and management program shall be adequately funded and implemented to ensure the long-term integrity of biological resources within the 1,355-acre SRCA" and "Direct and indirect degradation of habitat shall be prevented … through the prohibition or restriction of uses within the SRCA." Such specific issues as who would be the monitoring biologist and how often the project would be monitored, would be determined by the organization that ultimately assumes responsibility for management of the SRCA pursuant to Mitigation Measure 4.C-1.

RESPONSE NO. E1-8

All sensitive species potentially occurring on the project site are listed in Table 4.C-3 in Section 4.C, Biological Resources, of the Draft EIR. Specific to the comment, these species include

the San Diego black-tailed jackrabbit (*Lepus californicus bennittii*). As noted on page 4.C-62 of the Draft EIR, impacts to this species, as well as many other wildlife species, would be less than significant because project-related impacts would not result in substantial declines in regional population numbers. However, this comment is noted for the consideration of the decision-makers.

RESPONSE NO. E1-9

The Draft EIR does not describe the impacts on biological resources as "significant and ultimately unavoidable," as suggested by the commenter. Rather, the Draft EIR identified potentially significant impacts on sensitive plant species, riparian habitat, nesting birds, and oak trees prior to mitigation and concluded that all of the impacts would be mitigated to less than significant levels after mitigation. (Please refer to Response to Comment E1-2 regarding the project's significant and unavoidable impacts on topics other than Biological Resources.) Response to Comment E1-7 provides an overview of the recommended mitigation measures to address impacts to biological resources. As indicated therein, those measures include considerable detail regarding performance standards and implementation and they would be monitored through a MMP as described in Chapter 4.0 of this document.

RESPONSE NO. E1-10

As stated in the Draft EIR, the filming activities are an existing use and not a component of the proposed project. Filming activities which have historically occurred within the 166-acre Non-Development Continuing Use Area may continue.

If filming were to occur in the future within the 1,355-acre SRCA, which includes the Plum Canyon vernal pool and four artificial pools on the southern portion of Cruzan Mesa, such activities would be subject to Mitigation Measure 4.C-1, which requires approval of the activity by the SRCA habitat manager upon demonstration that the use would not be incompatible with the resource conservation objectives of the SRCA. The recent Quinn Fire, which occurred within a portion of the SRCA, is discussed on page 4.C-10 of the Draft EIR, and its area reflected in Figure 4.C-1. As described there, "… fire is an important part of the natural ecology of each of these vegetation communities and they are expected to fully recover to their pre-burn state within a couple of years. As such, the fire did not substantially diminish the resource value of these communities in the burn area." The analysis of the Biological Resources treats the burned area according to the pre-burn, and expected post-burn conditions. This approach to the analysis provides a conservative analysis and is consistent with the CEQA Guidelines. The suggestion that the EIR indicates that impacts to wildlife are unavoidable is in error. As stated on page 4.C-85 of the Draft EIR, impacts on biological resources after mitigation would be less than significant. Please also refer to Response to Comment E1-9 regarding the level of project impact and the proposed mitigation measures.

RESPONSE NO. E1-11

The comment is noted for the consideration of the decision-makers. As described in Response to Comment E1-4 above, a considerable number of new homes are expected to occur in the SCAG North Los Angeles County Subregion in a manner that is consistent with SCAG projections and planning for future service needs and transportation improvements. The Draft EIR addressed air quality and traffic in Sections 4.H, Air Quality and 4.F, Traffic/Access with supporting data provided in Appendices H and F of the Draft EIR. As concluded on page 4.H-10 of the Draft EIR, the project would have significant unavoidable impacts on air quality due to long term project operations.

With regard to traffic, Section 4.F, Traffic/Access of the Draft EIR described the existing conditions (identifying existing roadway deficiencies where they occur), identified project and cumulative impacts on the roadway system and recommended mitigation measures to reduce potential impacts. Significant impacts due to the project would occur during the P.M peak hour at Sierra Highway at Soledad Canyon Road (considered a cumulative impact as well) and Plum Canyon Road at Skyline Ranch/Heller Circle (South). The intersection of Golden Valley at Plum Canyon Road would have a significant cumulative impact during the A.M. peak hour. The analysis also identified significant cumulative traffic impacts on Highway 14 from Sand Canyon Road to south of the Sierra Highway interchange during the A.M. peak hour (southbound) and P.M. peak hour (northbound).

Proposed mitigation measures presented on pages 4.F-45 through 4.F-47, in Section 4.F, Traffic/Access of the Draft EIR, require the applicant to provide physical improvements at the intersection of Plum Canyon Road at Skyline Ranch Road/Heller Circle (South), and to pay fair share fees to the Bouquet Canyon and Eastside Bridge and Thoroughfare (B&T) Districts for the funding of intersection improvements at Golden Valley Road at Plum Canyon Road and Sierra Highway at Soledad Canyon Road. Roadway improvements made with the fees would reduce project impacts to less than significant levels. Two sets of roadway improvements have been proposed for Highway 14 (i.e., the Short Range Plan and Long Range Plan outlined in the North County Combined Highway Corridors Study, a report recently published by the Metro). If Caltrans establishes an impact fee mitigation program to implement the Highway 14 improvements prior to project implementation, the applicant would be required to pay a fair share contribution to that program. Implementation of such a program would substantially improve operating conditions and avoid cumulative impacts. However, since funding for the Highway 14 improvements are not in place, page 4.F-49 of the Draft EIR concludes that the project would contribute to a cumulative significant unavoidable impact.

RESPONSE NO. E1-12

The Draft EIR discussed air quality is Section 4.H, Air Quality with supporting data provided in Appendix H of the Draft EIR. As stated on page 4.H-40 of the Draft EIR, the project's operational emissions and the project's contribution to region-wide emissions would result in a significant and unavoidable air quality impact. Potential health impacts of certain air pollutants are described on pages 4.H-12 and 4.H-13 (which includes asthma and other respiratory ailments) and the location of receptors more sensitive to air pollutants (such as schools) are shown on Figure 4.H-1 of the Draft EIR. As stated on page 4.H-7 of the Draft EIR, the project is located in the South Coast Air Basin. Table 4.H-2 of the Draft EIR shows that the Basin, of which the Santa Clarita Valley is a part, is not in attainment for particulate matter. However, as illustrated in Table 4.H-3 of the Draft EIR, the National Ambient Air Quality Standards (NAAQS) for particulate matter were not exceeded at the monitoring station closest to the project site. Table 4.H-3 also demonstrates the trend towards the reduction of PM_{10} concentrations over time.

RESPONSE NO. E1-13

The Draft EIR addressed greenhouse gases (GHG) and global warming in Section 4.S, Global Climate Change with supporting data provided in Appendix K of the Draft EIR. The Supreme Court Decision, Massachusetts v. Environmental Protection Agency, which requires that the Environmental Protection Agency (EPA) regulate greenhouse gases under the federal Clean Air Act was discussed on page 4.S-3 of the Draft EIR. At the State level, the Office of Planning and Research (OPR) released a Technical Advisor on addressing climate change through CEQA review through the following: quantifying GHG emissions during project construction and operation; determining the significance of a project's impact to climate change; and where the project's impact is significant, identifying alternatives and mitigation measures (see page 4.S-5 of the Draft EIR). Consistent with the OPR Technical Advisory, greenhouse gas emissions, including CO_2, CH_4, and N_2O were calculated for construction and operation of the proposed project. Since publication of the Draft EIR, proposed amendments to the CEQA Guidelines have been prepared by OPR and adopted by the Natural Resources Agency and are under review by the Office of Administrative Law as described in Chapter 3.0, Corrections and Additions to the Draft EIR, in this Final EIR. However, given that extensive analysis of global warming was provided in the Draft EIR, the general suggestion that further discussion of the issue be provided is hard to interpret, therefore, no additional analyses are considered necessary.

RESPONSE NO. E1-14

The project would make public transportation available to future residents. As stated on page 4.F-38, in Section 4.F, Traffic/Access, of the Draft EIR, Santa Clarita Transit would be able to utilize Skyline Ranch Road as part of future bus routes to serve the project site.

RESPONSE NO. E1-15

The Draft EIR addressed tectonic activity and seismic risk in Section 4.A, Geotechnical Resources with supporting data provided in Appendix B of the Draft EIR. As indicated on page 4.A-11 of the Draft EIR, it is acknowledged that future residents of the proposed project would be exposed to strong ground shaking with potential for serious damage, typical to all of southern California. However, the analysis also indicates that such impacts would be less than significant due to compliance with the Uniform Building Code and County of Los Angeles standards and procedures which would reduce the potential for structural damage during a major earthquake.

RESPONSE NO. E1-16

The Draft EIR discussed paleontological resources in Section 4.D, Cultural and Paleontological Resources with supporting information included in Appendix E of the Draft EIR. As concluded on page 4.D-19, the overall paleontological sensitivity of the project's Area of Potential Effect (APE) is considered high, based on a records search conducted by the Los Angeles Museum of Natural History. Therefore mitigation measures are recommended which include a paleontological survey and treatment program, paleontological monitoring, and paleontological data recovery. Implementation of the mitigation measures presents an opportunity to discover resources that might not be discovered otherwise. The suggested lack of access to private property by researchers and scientists and the provision of a detailed stratigraphic analysis would not change the conclusion or mitigation measures presented in Section 4.D of the Draft EIR regarding paleontological resources. Furthermore, project implementation places nearly three quarters of the project site (the northern 1,551 acres) in undeveloped open space, thereby preserving access to a substantial amount of open space land.

RESPONSE NO. E1-17

As stated in Mitigation Measure 4.D-2(a) of the Draft EIR, the specific procedures for museum storage of any fossils found during grading would be identified in a paleontological resources monitoring and mitigation program prior to the implementation of grading or construction activities. It is anticipated that any fossils collected would be donated to a public, non-profit

institution, such as the Natural History Museum of Los Angeles County or to another non-profit institution with a research interest in the materials. Accompanying notes, maps, and photographs would also be filed at the repository. Based on past and recent experience submitting fossil specimens to the Natural History Museum of Los Angeles County, there is no evidence suggesting that there would be insufficient storage space at the museum to curate paleontological resources encountered during construction activities. While the magnitude of any fossils that might be encountered is speculative at this time, Mitigation Measure 4.D-2(a) of the Draft EIR includes provisions for museum storage, and this mitigation measure would be monitored to ensure proper implementation through a MMP as described in Chapter 4.0 of this document. Any curation costs would be incurred by the applicant. See also Chapter 3.0, Corrections and Additions to the Draft EIR, in this Final EIR.

RESPONSE NO. E1-18

Mitigation Measure 4.D-2(a), specifies that monitoring would be carried out by a qualified paleontologist. A qualified paleontologist is defined as a paleontologist meeting the criteria established by the Society for Vertebrate Paleontology including institutional affiliations/credentials, ability to recognize and recover vertebrate fossils in the field, local geological and biostratigraphic expertise, proficiency in identifying vertebrate fossils, and publications in scientific journals. A paleontological monitor has been trained by a qualified paleontologist to identify invertebrate fossils. A paleontological monitor would monitor earth-moving construction activities in those areas determined sensitive in the monitoring and mitigation program. In order to provide further clarification regarding the qualifications required for a paleontologist and paleontological monitor, revisions have been incorporated into Mitigation Measures 4.D-2(a), 4.D-2(b), and 4.D-2(c), as shown in Chapter 3.0, Corrections and Additions to the Draft EIR, in this Final EIR.

RESPONSE NO. E1-19

The Draft EIR addressed green building standards in Section 4.S, Global Climate Change with supporting data provided in Appendix K of the Draft EIR. The proposed project would include green building standards that are part of the County's Green Building Program under the Drought-Tolerant Landscaping Ordinance and Green Building Ordinance. These standards include water-efficient landscaping and irrigation, energy conservation, indoor water conservation, and recycling construction waste. The proposed project would also be certified under the California Green Builder (CGB) program. As described on pages 4.S-24 through 4.S-29 of the Draft EIR, the proposed project also would incorporate project objectives, project features, and mitigation measures that would promote alternative transportation, reduce water and energy use, offer homebuyers the option to participate in the LIVINGSMART program, and implement a green educational program.

RESPONSE NO. E1-20

The Draft EIR addressed fire hazards in Section 4.M, Fire Services and Hazards. As discussed in this section, the project site is located in a Very High Fire Hazard Severity Zone (VHFHSZ) and therefore additional Los Angeles County Fire Department (LACoFD) requirements are applicable to the project, including the preparation of a Fuel Modification Plan, a landscape plan, and an irrigation plan to reduce the threat of wildfire. Mitigation Measure 4.M-2 would ensure that a Fuel Modification Plan be reviewed and approved by the LACoFD and the Department of Regional Planning and would ensure that fuel modification and brush clearance zones are maintained around structures. The project would also comply with other applicable requirements including the County Fire Code, Building Code, and California Fire Code, and Conditions of approval from the LACoFD including design features and fire suppression equipment such as an automatic fire suppression system, fire alarm system, and evacuation life safety system. Project plans would be reviewed by LACoFD prior to the issuance of building permits to ensure that the project would be compliant with applicable fire codes, and regulations, and conditions.

Mitigation funding for the LACoFD is provided through the Los Angeles County Fire Department Developer Fee Program. Fees paid to the Developer Fee Program would be used toward land acquisitions, development of new facilities, and new equipment. The Developer Fees are adjusted annually to ensure that adequate levels of fire protection service are maintained. It is expected that these fees would be sufficient to off-set project demand on LACoFD services. The applicant would be required to pay fees prior to the issuance of building permits as specified under Mitigation Measure 4.M-1(a). Furthermore, development of the project would generate annually recurring revenue in the form of property taxes, a portion of which could be used by the County to address LACoFD operations and staffing.

RESPONSE NO. E1-21

The adequacy of fire service and ingress and egress to the project site is analyzed on pages 4.M-8 and 4.M-9, in Section 4.M Fire Services and Hazards (Subsection 3.c(1)), of the Draft EIR. Emergency access would be provided primarily through the off-site extension of Plum Canyon Road/Whites Canyon Road to the west and through the project site as Skyline Ranch Road, which would connect to Sierra Highway to the south. All project roadways would meet the requirements of the LACoFD to ensure adequate emergency access to the project site. These requirements are incorporated as Mitigation Measures 4.M-1(b) through 4.M-1(i) in the Draft EIR and may be subject to further refinement by the LACoFD upon review of final plans. Based on the location of existing and proposed fire stations, first-due response times and distance of the nearest fire station would be more than adequate. As indicated on page 4.F-48, in Section 4.F, Traffic, with implementation of traffic mitigation measures, no significant traffic and access impacts would occur

at local intersections. Therefore, as concluded in Section 4.M of the Draft EIR, project impacts on fire services would be less than significant with implementation of mitigation measures.

RESPONSE NO. E1-22

The Draft EIR addressed water resources in Section 4.I, Water Resources with supporting data provided in Appendix I of the Draft EIR. Water service to the project site would be provided by the Castaic Lake Water Agency (CLWA) Santa Clarita Water Division (SCWD). Groundwater sources include the East Subbasin of the Santa Clara River Valley Groundwater Basin (or aquifer) divided into the Alluvial Aquifer and the Saugus Formation. A Groundwater Management Plan was adopted by CLWA and local purveyors (including SCWD) in December 2003 to meet existing and projected water demands and avoid groundwater overdraft (among other management goals). As stated on page 4.I-40, in Section 4.I, Water Resources, of the Draft EIR, based on the analysis provided in the 2005 Urban Water Management Plan (UWMP) sufficient water supplies (including groundwater) would be available to meet projected demand from future development, which includes the proposed project. As shown on Table 4.I-3 of the Draft EIR, current and planned water supplies available to CLWA include local groundwater, State Water Project (SWP) water, water storage programs, water banking programs, and recycled water. While SWP water and groundwater associated with the western reaches of the Santa Clara River are among the supplies available to the proposed project, it would not be served exclusively by these supplies. Rather, the full range of supplies developed by CLWA would be used within the service area in accordance with the provisions of the UWMP and Groundwater Management Plan. Unless provisions are made by a developer to acquire supplies independently, specific water sources are not assigned on a project-specific basis. As discussed on pages 4.I-41 and 4.I-42 of the Draft EIR, although there is uncertainty regarding the availability of SWP water, based on the Department of Water Resource's 2007 SWP Delivery Reliability Report, sufficient water supplies would be available to serve the proposed project through 2030. Nevertheless, due to the reduction in SWP supply and Los Angeles County water conservation requirements, Mitigation Measures 4.I-1 through 4.I-5 are proposed to further reduce less-than-significant impacts to water supply. These measures include the use of water efficient fixtures, low flush toilets, water efficient irrigation, and drought-tolerant landscaping.

RESPONSE NO. E1-23

The WSA, attached as Appendix I-2 of the Draft EIR, included a discussion of Wanger decisions regarding delta smelt and Chinook salmon/steelhead in footnotes 12 and 13 and on pages 13 through 16. It is acknowledged that these rulings reduce the amount of water pumped from the Sacramento Delta and available to the State Water Project (SWP) for export to CLWA. The information presented in the WSA included the most recent Federal court decisions and Biological Opinions (BO) at the time the WSA was prepared. As described in the 2007 SWP Delivery

Reliability Report (which is incorporated by reference in WSA), simulations to evaluate future (2027) SWP delivery reliability incorporated the current interim court-ordered operating rules related to the delta smelt and climate change impacts to hydrology in the Central Valley to provide a range of estimated water deliveries. Based on this information, CLWA has determined that there are sufficient water supplies available for pending and future developments within the CLWA service area through 2030. Additional updates are provided in footnotes 38 and 39 in Section 4.I, Water Resources of the Draft EIR, based on recent BOs issued by the U.S. Fish and Wildlife Service on December 15, 2008 and by the National Marine Fisheries Service on June 4, 2009, both of which reduce Delta water exports to the rest of the State. However, the California Department of Water Resources has not issued formal guidance regarding how these BOs would affect the reliability of the SWP supplies. In the absence of such guidance and because the current WSA considers restrictions to the SWP based on the reduction in water pumped from the Delta, a new WSA is not necessary at this time and would not materially change the analysis or alter the conclusions presented in the Draft EIR. Prior to committing to serve the proposed project and before construction could begin, Los Angeles County would request that CLWA/SCWD prepare a water supply verification in compliance with Senate Bill 221 to ensure that adequate water supplies are available.

RESPONSE NO. E1-24

As stated in Response to Comment E1-22, there is adequate groundwater and other available water sources to meet projected water demands within the CLWA service area through 2030 even with reduction of the SWP water supply, including water storage programs, water banking programs, and recycled water. Groundwater is just one of the sources of available supplies. No additional piping or pumps would be required to provide water service to the project site beyond those described on page 4.I-43, Section 4.I, Water Resource of the Draft EIR. As indicated therein, water lines to the project site would connect to the existing 8- and 10-inch pipelines in Sierra Highway, and a new 16-inch line in Sierra Highway would connect the existing CLWA SCWD Deane water tank.

RESPONSE NO. E1-25

The water supply referenced in the comment is well water from the western end of the groundwater basin that is currently used for agricultural use. This is not a supply that would serve the proposed project. The WSA and Section 4.I, Water Resources, of the Draft EIR included a cumulative analysis based on reasonably foreseeable projects identified in the 2005 UWMP and additional information related to the 2007 SWP Reliability Report. Based on this information, and as stated on page 4.I-46 of the Draft EIR, CLWA has determined that there are sufficient water supplies available for pending and future residential and commercial developments within the

CLWA service area through 2030. It is also noted that the Draft EIR and the WSA identify future water supplies associated with the development of Newhall Ranch that contribute to the overall water supply sources for CLWA. These include 18,828 af in the Semitropic Water Storage District Groundwater Banking Project, 1,607 af of Nickel Water, and up to 5,400 af of recycled water (see Table 4.I-3 and pages 4.I-38 and 4.I-39 of the Draft EIR).

RESPONSE NO. E1-26

The Draft EIR addressed ammonium perchlorate on pages 4.I-9 and 4.I-10 in Section 4.I, Water Resources. As stated therein, due to the detection of ammonium perchlorate, four wells were removed from active water service in the Saugus Formation and two wells were removed in the Alluvial Aquifer. In October 2005 one of the Alluvial wells (Valencia Water Company's [VWC] Well Q2) was returned to active water service with the operation of wellhead perchlorate removal technology. VWC's Well 157 was sealed and abandoned and replaced with Well 206 in a non-impacted part of the water basin. As stated on page 22 of the WSA, included as Appendix I-2 of the Draft EIR, of the six wells that were removed from service, four wells with a combined capacity of 7,200 gallons per minute (or approximately 11,600 acre feet per year [afy]) remain out of service. The combined active groundwater source capacity of the Alluvial Aquifer and Saugus Formation (not including the contaminated wells) is 82,000 afy. As stated in the WSA and based on the 2005 UWMP the groundwater is more than sufficient to meet the groundwater component of water supply in Santa Clarita Valley. This was also recently confirmed by a study of the Alluvial Aquifer and Saugus Formation, which supports the 2005 UWMP.[1] See also Response to Comment E1-22, regarding the current and projected ground water supply available to CLWA.

Regarding clean up of groundwater, as described on page 4.I-10 of the Draft EIR, CLWA and the affected Local Purveyors have undertaken a comprehensive groundwater containment, treatment, and restoration project to address perchlorate contamination. The project will intercept the perchlorate plume in the Saugus Formation groundwater. Contaminated water will then be pumped from intercepting wells to the new treatment facility where the chemical will be removed and the treated water used as part of the Santa Clarita Valley drinking water supply. Construction of the treatment facility began in November of 2007 and treatment commenced in the fall of 2009. A permit from the California Department of Public Health is expected in early 2010, at which time the treated water will be used as a water supply.[2]

---

[1] *Castaic Lake Water Agency News Release, "Study Shows Santa Valley Clarita Groundwater to be a Reliable Water Supply Now and for the Future," available: http://www.clwa.org/about/pdfs/PressRelease081909.pdf*

[2] *Ford, Jeff, Water Resources Planner, Castaic Lake Water Agency, 2009.*

Regarding health risks and previous litigation related to ammonium perchlorate, these are not comments on the content or adequacy of the Draft EIR and therefore no further response is required. However, a summary of related litigation related to the treatment of contaminated water was provided on page 4.I-9 of the Draft EIR.

RESPONSE NO. E1-27

Please see Response to Comment E1-26 regarding reduction of groundwater production due to ammonium percholate contamination, which would not reduce the ability of groundwater supplies to meet existing and projected demand, as analyzed in the 2005 UWMP. Regarding the table "Saugus Formation Wells Actions" (attached as Comment E1-35), this reduction in capacity was taken into consideration by the Perchlorate Settlement Agreement and the analysis presented in Appendix I-1, Water Resources Technical Report of the Draft EIR. Under this agreement, the responsible parties have agreed to pay for replacement wells to compensate. The new wells are in the planning stages and are expected to be operational in 2012.[3]

RESPONSE NO. E1-28

Please see Responses to Comments E1-22 regarding adequacy of water supply, E1-23 regarding cumulative development, and E1-26 and treatment of contaminated groundwater. The resolution is attached as Comment E1-36 and will be forwarded to the decision-makers for their consideration. As described in Section 4.I, Water Resources and Appendix I of the Draft EIR, neither the proposed project nor development within the Santa Clarita Valley relies on water from the four contaminated wells in the Saugus Formation, and as discussed in Responses to Comments E1-26 and E1-27, treated water will be available for use as a water supply in early 2010, and replacement wells are planned to compensate for any reduction in capacity as a result of the ammonium perchlorate treatment facilities. Water supply within the Santa Clarita Valley is adequate to meet existing and projected demand in the Santa Clarita through the year 2030 based on projections in the 2005 UWMP.

RESPONSE NO. E1-29

Both CLWA and CLWA SCWD are mandated to provide water to the Santa Clarita Valley. They do not promote or approve development, other than to verify whether their current and projected water supplies are adequate to serve this development. There is no conflict of interest associated with their supplying water to qualifying projects; this is what they are required to do.

[3] *Ford, Jeff, Water Resources Planner, Castaic Lake Water Agency, 2009.*

The water supply information presented in Section 4.I of the Draft EIR, including Appendix I was provided for agency review during the public comment period of the Draft EIR. In addition to CLWA, Santa Clarita Water Division, and Newhall County Water District, other water resource planning agencies and organizations who received a copy of the Draft EIR for review and comment include the California Regional Water Quality Control Board, California Department of Water Resources, and California Water Impact Network. The information presented in the Draft EIR is consistent with the 2005 UWMP and 2007 State Water Project Delivery Reliability Report, which also are circulated for agency and public review and comment. In addition, the WSA was included as an appendix to the Draft EIR and thus was available for review during the public comment period**.**

As stated on page 4.I-40 of the Draft EIR, the proposed project was identified as a future land use in the 2005 UWMP and used in conjunction with other pending projects to estimate future water demand. Consistency with the UWMP, 2007 State Water Project Delivery Reliability Report, and other County water conservation requirements would ensure equitable distribution and use of water throughout the Santa Clarita Valley.

RESPONSE NO. E1-30

The comment is noted for the consideration of the decision-makers. The entire region would not be continuous urban and suburban development, as nearly 1,551 acres in the northern portion of the project site would remain as undeveloped open space which is contiguous to the Angeles National Forest. The project site represents only a portion of proposed development within the Santa Clarita Valley. The Draft EIR included a cumulative analysis within each of the environmental topics analyzed in Chapter 4.0 of the Draft EIR. The cumulative analyses evaluated impacts of the project in combination with other new development occurring in the project vicinity. The methodology used for the cumulative analysis, as well as an identification of other new development that is expected to occur is presented in Chapter 3.0 of the Draft EIR. Section 6.C, of the Draft EIR, Growth-Inducing Impacts, evaluated the potential of the proposed project to foster growth. As discussed therein, the proposed project would not foster growth beyond its own contribution to the population base. Also, refer to Response to Comment E1-4 regarding future growth in north Los Angeles County.

RESPONSE NO. E1-31

Please see Responses to Comments E1-22 through E1-29 regarding water supply. As concluded in the Draft EIR, the WSA prepared for the proposed project, and 2005 UWMP, there is sufficient water supplies available to meet projected demand from future development, including the proposed development.

RESPONSE NO. E1-32

The comment, which draws conclusions based on earlier comments, was previously addressed. Please see Responses to Comments E1-3 regarding open space, E1-6 through E1-11 regarding wildlife, and E1-16 regarding fossil resources. Also refer to Response to Comments E1-4 and E1-30 regarding growth in the region.

RESPONSE NO. E1-33

The comment is noted for the consideration of the decision-makers. As described in Response to Comment E1-19, the project includes design features and mitigation measures that address the implementation of green building standards. As described in Response to Comment E1-6, the project would not impact wildlife corridor movement. As noted in Response to Comment E-14, the proposed project would facilitate the extension of existing Santa Clarita Transit bus service along Skyline Ranch Road.

RESPONSE NO. E1-34

Preference for the "development alternative" is noted for the consideration of the decision-makers, however it is not clear what alternative the commenter is referring to. Chapter 5.0, Alternatives, of the Draft EIR presents an analysis of a No Project/No Development Alternative, Reasonably Foreseeable On-Site Development Alternative (200 Residential Lots), Reduced Project Alternative A (800 Residential Lots), and Reduced Project Alternative B (935 Residential Lots). The analysis indicates that two of the reduced density alternatives (Reasonably Foreseeable On-Site Development Alternative and Reduced Project Alternative A), would increase certain project impacts, in particular those related to biological and open space/land use/visual issues. The Reduced Project Alternative B reduces or avoids those adverse impacts and would lessen impacts for most environmental issues. Therefore Reduced Project Alternative B is identified as the environmentally superior alternative. However, with reconfiguration of the Reduced Project Alternative B site plan, traffic impacts on Whites Canyon Road and Plum Canyon Road would increase. Furthermore, the Reduced Project Alternative B would not avoid the project's significant impacts and would not fully meet the project objectives.

RESPONSE NO. E1-35

Please see Response to Comment 27 regarding the information presented in this table.

RESPONSE NO. E1-36

Please see Responses to Comments 26 and 28 regarding contamination and clean up of the Saugus wells and the effect on available groundwater supply.

Letter F1

From: Nancy Corwin [nancyleec2@yahoo.com]
To: Bush, Michele
Cc:
Sent: Tue 8/4/2009 6:43 PM
Subject: Comments on the EIR

Dear Michele Bush,
I wish to address the issue of the proposed Skyline Ranch Project number 04-06-075-(5).
I feel that in interest of our community it would not be wise for this project to move forward.
As stated in the letter sent out by Jon Sanabria the "unavoidable impacts" such as the visual qualities, noise, air quality, law enforcement services, cumulative traffic (which is my biggest concern), solid waste disposal and global climate change are all enormous issues which send up a red flag. **F1-1**
I ask you and the Department of Reginol Planning to halt the passage of this proposal.
Thank you for taking into consideration my concerns.
Mrs. Nancy L Corwin
28150 Haxton Dr.
Canyon Country, CA 91351

From: Nancy Corwin [mailto:nancyleec2@yahoo.com]
Sent: Tuesday, August 04, 2009 6:43 PM
To: Bush, Michele
Subject: Comments on the DEIR

Δεαρ Μιχηελε Βυση,
Ι ωιση το αδδρεσσ τηε ισσυε οφ τηε προποσεδ Σκψλινε Ρανχη Προφεχτ νυμβερ 04–06–075–(5).
Ι φεελ τηατ ιν ιντερεστ οφ ουρ χομμυνιτψ ιτ ωουλδ νοτ βε ωισε φορ τηισ προφεχτ το μοϖε φορωαρδ.
Ασ στατεδ ιν τηε λεττερ σεντ ουτ βψ ϑον Σαναβρια τηε ∀υναϖοιδαβλε ιμπαχτσ∀ συχη ασ τηε ϖισυαλ θυαλιτιεσ, νοισε, αιρ θυαλιτψ, λαω ενφορχεμεντ σερϖιχεσ, χυμυλατιϖε τραφφιχ (ωηιχη ισ μψ βιγγεστ χονχερν), σολιδ ωαστε δισποσαλ ανδ γλοβαλ χλιματε χηανγε αρε αλλ ενορμουσ ισσυεσ ωηιχη σενδ υπ α ρεδ φλαγ.
Ι ασκ ψου ανδ τηε Δεπαρτμεντ οφ Ρεγινολ Πλαννινγ το ηαλτ τηε πασσαγε οφ τηισ προποσαλ.
Τηανκ ψου φορ τακινγ ιντο χονσιδερατιον μψ χονχερνσ.
Μρσ. Ναν χψ Λ Χορωιν
28150 Ηαξτον Δρ.
Χανψον Χουντρψ, ΧΑ 91351

LETTER NO. F1

Nancy L. Corwin
28150 Haxton Dr.
Canyon Country, CA 91351

RESPONSE NO. F1-1

The comment is noted. The commenter references the conclusions of the Draft EIR as stated in the Los Angeles County Department of Regional Planning's Notice of Public Hearing and Notice of Completion and Availability, distributed on July 30, 2009. The Draft EIR addressed visual qualities in Section 4.E, Visual Qualities; noise in Section 4.G, Noise; air quality in Section 4.H, Air Quality; law enforcement services in Section 4.L, Law Enforcement Services; cumulative traffic in Section 4.F, Traffic/Access (pages 4.F-47 and 4.F-48); solid waste disposal in Section 4.K, Solid Waste Disposal; and global climate change in Section 4.S, Global Climate Change. Supporting technical date and analysis for noise, air quality, traffic, and global climate change were provided in Appendix G, Appendix H, Appendix F, and Appendix K, respectfully.

Letter F2

From: LKakumu@aol.com [mailto:LKakumu@aol.com]
Sent: Tuesday, August 18, 2009 12:06 PM
To: Bush, Michele
Subject: DEIR County Project Number 04-075-(5)

Our community cannot afford another housing track! The infrastructure is not adequate to accommodate the increase in traffic from opening up Plum Canyon Road southbound unto Whites Canyon. **F2-1**

The intersection at Whites Canyon and Nadal is a nightmare when Canyon High School begins and ends (not to mention the traffic from Leona Cox Elementary School). Numerous accidents occur at this intersection and the Sheriff's department cannot control cars running through the signal or the speeding. **F2-2**

There is already a housing track on hold on Plum Canyon; and when that is completed it will add to the existing traffic and noise, but when you add yet another housing track that becomes a dangerous situation. **F2-3**

Lastly, when a new housing track is built the developer never pays his fair share for infrastructure; and in this economy the tax payer cannot afford another tax increase to cover items that the developer did not pay for. **F2-4**

Sincerely,
Lynn Kakumu
28026 Damar Court
Canyon Country, CA 91351

LETTER NO. F2

Lynn Kakumu
28026 Damar Court
Canyon Country, CA 91351

RESPONSE NO. F2-1

The comment is noted. The Draft EIR analyzed traffic in Section 4.F, Traffic/Access with supporting data provided in Appendix F of the Draft EIR. Future improvements to Whites Canyon Road are shown on the County's Highway Plan and Draft Highway Plan. As stated in pages 4.F-38 through 4.F-42 (Subsection 3.c(8)) of the Draft EIR, access to the project site would be provided through the extension of Plum Canyon Road/Whites Canyon Road on the west (through Tract Map No. 46018) as Skyline Ranch Road, and south to Sierra Highway as shown on the Draft Highway Plan. This proposed alignment was conditionally approved by the Los Angeles County Department of Public Works. The extension of Whites Canyon Road, under a different alignment is shown on the County's existing Highway Plan but is recommended for deletion by the County due to the amount of grading that would be required and the impact on sensitive biological resources. A comparison of the long-range traffic volumes and alignments under the existing Highway Plan and Draft Highway Plan was depicted on Figure 4.F-14 of the Draft EIR. As concluded in page 4.F-39 of the Draft EIR, the effect of changing the configuration of these roadways would result in little to no change on the surrounding roadway networks.

RESPONSE NO. F2-2

As concluded on pages 4.F-18 and 4.F-19 of the Draft EIR, with implementation of traffic mitigation measures (including intersection improvements and payment of B&T District fees) project impacts on area roadways would be less than significant. As indicated in Table 4.F-11 of the Draft EIR, with the proposed connection of Skyline Ranch Road between Whites Canyon Road and Sierra Highway, traffic volumes on Whites Canyon Road would be reduced by approximately 4,000 daily trips. Because project-generated traffic is estimated to add less than 2,500 daily trips to Whites Canyon Road (based on project trip generation and traffic distribution presented on pages 2-2 and 2-5, respectively of Appendix F, Traffic Impact Analysis), a net decrease in traffic through the Nadal Street intersection is anticipated once the connection to Sierra Highway is completed. Regarding accidents at the intersection due to cars running the signal or speeding, enforcement of existing traffic laws is beyond the scope of the EIR. However, as discussed in Section 4.L, Law Enforcement, development of the proposed project would require payment of a Law Enforcement Facilities Fee and mitigation measures to reduce project impacts on the Sheriff's Department.

RESPONSE NO. F2-3

It is not clear which Plum Canyon housing tract currently on hold the commenter is referring to. However, the analysis of traffic and noise impacts in Sections 4.F, Traffic/Access and 4.G, Noise of the Draft EIR considered development of related projects in the area, such as Tract 46018 west of the project site on Plum Canyon Road, which has been approved but not constructed. As concluded in page 4.F-49 of the Draft EIR, with implementation of mitigation measures, cumulative traffic impacts would be less than significant. As stated in pages 4.G-43 through 4.G-45 of the Draft EIR, development of the proposed project and related projects would result in significant unavoidable mobile noise impacts at off-site locations along segments of Sierra Highway and Whites Canyon Road.

RESPONSE NO. F2-4

The commenter is incorrect. As stated in the Draft EIR the developer would be required to pay a fair share for infrastructure including: Bouquet Canyon and Eastside B&T fees for roadway improvements; annexation and connection fees for wastewater collection and treatment; Law Enforcement Facilities Fees for law enforcement facilities; Los Angeles County Fire Department Developer Fees towards overall Department acquisition, facility improvements, and equipment funding; Developer Fees to the Sulphur Springs School District, Saugus Union School District and William S. Hart High School District towards the construction or modernization of school facilities; Library Facilities Mitigation Fees towards improvement of local library services and resources; and Quimby fees towards the development of park space. In addition, the proposed project includes the dedication of an 11-acre elementary school site to the Sulphur Springs School District and the dedication of an approximately 12-acre fully improved public park to the County of Los Angeles Department of Parks and Recreation. Furthermore, the project would construct the extension of Whites Canyon Road to Sierra Highway (as Skyline Ranch Road), a major infrastructure improvement proposed by the County in the Draft Highway Plan to improve the regional roadway system.

Letter F3

From: dwohlleben@socal.rr.com
Sent: Sunday, September 13, 2009 9:39 PM
To: Bush, Michele
Subject: Skyline Ranch Road--- Urgent

Hello, I live at and own the property at 29619 Fitch Ave Canyon. Country 91351.Myself and other homeowners in the neighborhood would like to know and see on a good map the panned extension of a road from Plum canyon Road to Sierra Highway. Exactly where it will begin and end??? **F3-1**
We received letter from Jon Sanabria re this matter and I am unable to see exactly, nor find on the website, were this road starts and ends . It goes before a meeting on Sept 16. Thank-you so much for your prompt attention to this.
Sincerely,
Dianne Wohlleben
661 6188023

LETTER NO. F3

Dianne Wohlleben
29619 Fitch Avenue
Canyon Country, CA 91351

RESPONSE NO. F3-1

The letter from Jon Sanabria referenced by the commenter is the Los Angeles County Department of Regional Planning's Notice of Public Hearing and Notice of Completion and Availability, distributed on July 30, 2009. This Notice included a vicinity map but not a detailed map of the planned roadway extension (i.e., Skyline Ranch Road). The County's notice also included a link to the County's website and the Draft EIR prepared for the project. The Draft EIR provides a more detailed description of the extension of Whites Canyon Road/Plum Canyon Road (as Skyline Ranch Road) to Sierra Highway. Specifically, Figures 2-3, 2-4, 2-6, 2-8, 2-9, and 4.F-14 of the Draft EIR, show the proposed extension. As described on page 2-17, in Chapter 2.0, Project Description of the Draft EIR, Skyline Ranch Road would extend from Plum Canyon Road/Whites Canyon Road on the west through Tract Map No. 46018 (requiring the realignment and partial vacation of Farrell Road), to the southeast and through the project site, ultimately connecting to Sierra Highway just north of Adon Road.

Letter F4

From: Kathryn Marsailes [mailto:kmarsai@fastmail.fm]
Sent: Monday, September 14, 2009 11:34 PM
To: Bush, Michele
Subject: Comments on county project 04-075-(5)

These comments are in regard to environmental impact report for state clearinghouse number 2004101090 county project number 04-075-(5) vesting tentative tract map no. 060922 conditional use permit 04-075 oak tree permit case no. 04-075 highway realignment case no. 200900001. F4-1

I live at 17601 Sierra Hill St. and am concerned about the impact the the above proposed development. Firstly, since I have asthma, the detrimental affect on air quality caused by the extensive grading is worrisome.

The affects of the grading on runoff and possible flooding or mudslides for our area are of also of concern. F4-2 The extension of a road to Sierra Highway, which is seems to be near to Sierra Cross, will probably cause significant congestion. F4-3 Lastly, the report states that "Wildlife diversity on the site is moderate, commensurate with the rather homogeneous nature of the sage scrub and grassland-covered slopes and ridges that comprise most of the site." For your records I am including a list of wildlife that I have seen on my property over the last 8 years. I am not sure what the definition of "moderate wildlife diversity" is for this area, but I would encourage the county to preserve as much of the undeveloped sage scrub areas as possible as well as the other six vegetation communities Skyline Ranch supports according to your report. With so much of the Angeles National Forest having burned in this last fire, it might be wise to preserve more animal habitat.

Over the years on my property alone I have seen:

bobcats
coyotes
raccoons
king snakes
rattlesnakes
gopher snakes
a red coach whip
legless lizards F4-4
screech owls
great horned owls
tarantulas
tarantula wasps
"sun spiders" or solpugids
alligator lizards
fence lizards
roadrunners
rabbits
ground squirrels
monarch butterflies
yellow swallowtail butterflies
moths
mule deer
Southern California toads
oreoles
titmouse(mice?)

peregrine falcons
red-tailed hawks
robins
California quails (large flocks)
hummingbirds
ravens
crows
mourning doves
purple finches
yellow finches
scorpions
broad-winged katydid
cone-nose bugs
ten-lined June beetles
woodpeckers
Jerusalem crickets
And my husband might have seen a young mountain lion because it was a "bobcat, but it had a tail."

I am hoping that you will preserve as much of the natural habitat as you can.

F4-4
Cont'd

LETTER NO. F4

Katherine Marsailes
17601 Sierra Hill Street
Canyon Country, CA 91351

RESPONSE NO. F4-1

The comment is noted. The Draft EIR discussed air quality is Section 4.H, Air Quality with supporting data provided in Appendix H of the Draft EIR. Specifically, air quality impacts from construction activities associated with the proposed project (including grading) were analyzed on pages 4.H-18 through 4.H-27 of the Draft EIR and were determined to be temporarily significant and unavoidable for PM_{10}, $PM_{2.5}$, CO, NO_x, and VOC emissions. The potential health impacts of certain air pollutants on receptors more sensitive to air pollutants (such as residential) are described on pages 4.H-12 and 4.H-13 and the locations of these sensitive receptors are shown on Figure 4.H-1 of the Draft EIR.

RESPONSE NO. F4-2

The Draft EIR discussed the effects of grading on runoff, flooding, and mudslides in Sections 4.A, Geotechnical Resources and 4.B, Hydrology and Water Quality with supporting data provided in Appendices B and C of the Draft EIR. As concluded on page 4.A-19, in Section 4.A, Geotechnical Resources, geological impacts associated with slope stability and soil erosion, which contribute to the potential for mudslides, would be limited to the project site and less than significant with incorporation of Mitigation Measures 4.A-3(a) through 4.A-3(o) and 4.A-5 as well as compliance with the standard engineering practices and regulatory requirements. Regarding runoff and flooding impacts during construction (which are also contributory factors for the mudslide potential), as stated on page 4.B-42 of the Draft EIR, with implementation of Mitigation Measures 4.B-2 and 4.B-3 and compliance with other regulatory requirements, impacts from erosion and sedimentation would be less than significant and contained on site.

RESPONSE NO. F4-3

The Draft EIR evaluated traffic in Section 4.F, Traffic/Access with supporting data provided in Appendix F of the Draft EIR. The extension of Whites Canyon Road to Sierra Highway was analyzed in pages 4.F-38 through 4.F-42 (Subsection 3.c(8)) of the Draft EIR. This proposed alignment was conditionally approved by the Los Angeles County Department of Public Works and is shown on the Draft Highway Plan. The extension of Whites Canyon Road, under a different

alignment is shown on the County's existing Highway Plan but is recommended for deletion by the County due to the amount of grading that would be required and the impact on sensitive biological resources. A comparison of the long-range traffic volumes and alignments under the existing Highway Plan and Draft Highway Plan was depicted on Figure 4.F-14 of the Draft EIR. As concluded in page 4.F-39 of the Draft EIR, the effect of changing the configuration of these roadways would result in little to no change on the surrounding roadway networks. Furthermore, project-generated traffic impacts on local roadways would be less than significant with implementation of Mitigation Measures 4.F-1(a) through 4.F-3. Cumulative traffic impacts would also be less than significant with the exception of impacts to Highway 14 between Sand Canyon Road to south of the Sierra Highway interchange. As shown on Figure 2-6, in Chapter 2.0, Project Description of the Draft EIR, Skyline Ranch Road would extend from Plum Canyon Road/Whites Canyon Road on the west through Tract Map No. 46018, to the southeast and through the project site, and connect to Sierra Highway just north of Adon Road and approximately one-third of a mile southwest of Sierra Cross Avenue.

RESPONSE NO. F4-4

The Draft EIR addressed wildlife in Section 4.C, Biological Resources with supporting data provided in Appendix D of the Draft EIR. The term "wildlife diversity" is used in the documentation to refer to two dimensions of wildlife populations on site. The first dimension is the number of species which reflects the diversity of habitats present in terms of the range in biological and physical/structural components. Given that wildlife have preferences for certain habitat types, (for example, grassland has very little diversity in the form of vegetation and physical structure, whereas a grassland may support an abundance in numbers of certain species that prefer grassland as habitat), the number of such species may only be a relatively few. On the other hand, grassland that includes oak trees as an added structural component may support these same species plus species that require trees. Hence, the number of species may be higher. The second dimension is the relative distribution of numbers of animals across a suite of species. For example, based on a mosaic of habitats present where one particular habitat type strongly dominates an area, a few species may represent 90 percent of the individual animals present. In comparison, a mosaic of habitats where several habitat types equally share coverage of a site may support comparable numbers of individuals across a wide range of species. In terms of wildlife diversity, areas that exhibit a greater number of species and a more even distribution of individuals among those species are said to be more diverse than areas where either few species are present or where a few species make up the majority of individuals present. Guided by this principle, page 4.C-20 of the Draft EIR states that "wildlife diversity on the site is moderate, commensurate with the rather homogeneous nature of the sage scrub and grassland-covered slopes and ridges that most of the site." This means that although many species may be present, the numbers of some many species may be limited by the restricted distribution of they prefer. In other words, the statement that wildlife diversity on site

is moderate refers to the predominance of sage scrub habitats and grassland found there and the lack of multiple structural dimensions within those habitats.

Regarding the preservation of natural habitat, as described on page 2-32 through 2-34 in Chapter 2.0, Project Description, of the Draft EIR, and in Section 4.C, Biological Resources, nearly three quarters of the project site (approximately 1,551 acres) in the more sensitive northern portion of the project site would remain undeveloped. Regarding the recent fire, as stated on 4.C-10 of the Draft EIR, even though approximately 100 acres were burned during the Quinn Fire the vegetation communities are expected to fully recover to their pre-burn state within a couple of years.

The list of animals presented in the comment is noted. This information is consistent with the discussion provided in Section 4.C, Biological Resources of the Draft EIR for the project site.

Letter G1

COUNTY OF LOS ANGELES

FIRE DEPARTMENT

1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063-3294

(323) 890-4330

P. MICHAEL FREEMAN
FIRE CHIEF
FORESTER & FIRE WARDEN

October 22, 2009

NOV - 5 2009

Ms. Michele Bush
Department of Regional Planning
Impact Analysis Section
320 West Temple Street
Los Angeles, CA 90012

Dear Ms. Bush:

DRAFT ENVIRONMENTAL IMPACT REPORT, SUBJECT: DRAFT ENVIRONMENTAL IMPACT REPORT SKYLINE RANCH PROJECT, COUNTY PROJECT 04-075, STATE CLEARINGHOUSE NO. 2004101090, SANTA CLARITA (FFER #200900143)

The Draft Environmental Impact Report has been reviewed by the Planning Division, Land Development Unit, Forestry Division, and Health Hazardous Materials Division of the County of Los Angeles Fire Department. The following are their comments: **G1-1**

PLANNING DIVISION:

1. We have already reviewed this project several times and some of our previous comments have not been incorporated into the Draft EIR. Therefore, we reiterate the following comments:

CHAPTER 4.0 ENVIRONMENTAL IMPACT ANALYSIS, SECTION M. FIRE SERVICESAND HAZARDS 2. EXISTING CONDITIONS: **G1-2**

1. Paragraph 2.b.(1) Fire Protection Services/Facilities: Paragraph 1, for clarity, it should be noted the Departmental overview information cited in the first paragraph is from 2007. Since no major changes in the Department have occurred, the 2007 overview information is adequate to address impacts on this project.

2. Paragraph 3 - the second closest Fire Station is now Fire Station 132, placed in service in Spring 2007. Fire Station 132 is located at 29310 Sand Canyon Road, Santa Clarita, CA 91387, approximately 2 miles east of the project site. It has a 4-person engine company. **G1-3**

Being that Fire Station 132 replaces Fire Station 104 as the second closest Fire Station to the project, the sentence that references a permanent location for Fire Station104 should be deleted since there will be no other reference to Fire Station 104 in the Draft EIR. **G1-3** Cont'd

3. Paragraph 5 - Sentences three and four, which refer to Fire Station 104's statistical information, should be replaced with Fire Station 132's statistical information for the year 2008. Fire Station 132 responded to a total of 704 incidents. Of these, 44 were fire related incidents, 502 were emergency medical incidents, and 158 were other types. **G1-4**

4. Paragraph 6 - The first two sentences should be modified to read: "Funding for LACoFD staffing is provided primarily through property taxes and a voter approved special tax."

5. The Developer Fee Program described above, generates funding for land acquisition and development of new facilities and equipment. **G1-5**

PROJECT IMPACTS

6. Paragraph c.(1) Fire Protection Service: Paragraph 2 - The first sentence should be modified to read: "As described above, the project would be required to pay fees pursuant to the Los Angeles County Fire Department's Developer Fee Program, which would be used toward land acquisitions, new facilities and equipment." Also, the last four sentences of this paragraph should be deleted. It is incorrect to state that fire protection services are funded by recurring revenue to the County's General Fund. The Los Angeles County Fire Department is not a general fund department. It is a special district directly funded by property taxes in the project area. It is the increase in property tax revenue generated by the project that would fund fire protection services. **G1-6**

LAND DEVELOPMENT UNIT:

1. We have no comments at this time. **G1-7**

FORESTRY DIVISION – OTHER ENVIRONMENTAL CONCERNS:

1. The statutory responsibilities of the County of Los Angeles Fire Department, Forestry Division include erosion control, watershed management, rare and endangered species, vegetation, fuel modification for Very High Fire Hazard Severity Zones or Fire Zone 4, archeological and cultural resources, and the County Oak Tree Ordinance. Potential impacts in these areas should be addressed. **G1-8**

HEALTH HAZARDOUS MATERIALS DIVISION:

1. We have no comments at this time. **G1-9**

If you have any additional questions, please contact this office at (323) 890-4330.

Very truly yours,

FRANK VIDALES, ACTING CHIEF, FORESTRY DIVISION
PREVENTION SERVICES BUREAU

FV:lj

LETTER NO. G1

County of Los Angeles Fire Department
Frank Vidales, Acting Chief
Forestry Division
Prevention Services Bureau
1320 North Eastern Avenue
Los Angeles, CA 90063-3294

RESPONSE NO. G1-1

Responses from the respective divisions are provided in Responses to Comments G1-2 through G1-9 below.

RESPONSE NO. G1-2

The comment is noted. Regarding citing the date of the overview information, as stated on page 4.M-3 of the Draft EIR, Subsection 2.b(1), Fire Protection Services/Facilities, the majority of the overview information is based on the 2007 Statistical Summary, with minor updates to the service area provided by the Fire Department on May 27, 2009. Therefore, no additional revisions are necessary.

RESPONSE NO. G1-3

The updated fire station information is noted. These revisions have been incorporated into Chapter 3.0, Corrections and Additions to the Draft EIR, in this Final EIR.

RESPONSE NO. G1-4

The updated statistical information is noted. These revisions have been incorporated into Chapter 3.0, Corrections and Additions to the Draft EIR, in this Final EIR.

RESPONSE NO. G1-5

The corrections to the description of funding provisions for the LACFD are noted. These corrections have been incorporated into Chapter 3.0, Corrections and Additions to the Draft EIR, in this Final EIR.

RESPONSE NO. G1-6

The corrections to the description of funding provisions for the LACFD are noted. These corrections have been incorporated into Chapter 3.0, Corrections and Additions to the Draft EIR, in this Final EIR.

RESPONSE NO. G1-7

This comment is noted.

RESPONSE NO. G1-8

The Draft EIR addressed erosion control and watershed management in Sections 4.A and 4.B with supporting technical data and analysis provided in Appendices B and C. Rare and endangered species, vegetation, fuel modification within a Very High Fire Hazard Severity Zone, and the County Oak Tree Ordinance were analyzed in Sections 4.C and 4.M of the Draft EIR with supporting information included in Appendix D. Archaeological and cultural resources were discussed in Section 4.D of the Draft EIR with additional technical information included in Appendix E.

RESPONSE NO. G1-9

This comment is noted.

California Natural Resources Agency
DEPARTMENT OF FISH AND GAME
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123
(858) 467-4201
http://www.dfg.ca.gov

ARNOLD SCHWARZENEGGER, Governor
DONALD KOCH, Director

November 5, 2009

Michele Bush
County of Los Angeles
Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, California 90012

Subject: Notice of Completion and Availability of the Draft Environmental Impact Report for the Skyline Ranch Project, County Permit No. 04-075 in the Santa Clarita Valley, Los Angeles County, California SCH # 2004101090

Dear Ms. Bush:

The Department of Fish and Game (Department) has reviewed the Draft Environmental Impact Report (DEIR) for the Skyline Ranch Project. The County of Los Angeles is acting as lead agency for the project. The proposed project is located in the Santa Clarita Valley west of Sierra Highway and north of Highway 14. The proposed project would occupy approximately 2,173 acres and would develop approximately 622 acres of the southern portion of the site, including 1,313 lots consisting of 1,260 residential lots, a 22-acre elementary school site, 10 lots for park areas, 13 debris basin lots, four water tank/booster pump station lots, and 25 open space lots. Three quarters of the site (northern 1,551 acres) is proposed to remain undeveloped, with approximately 1,355 acres dedicated or designated as open space through the establishment of the Skyline Ranch Conservation Area (SRCA). Approximately 166 acres of undeveloped land in the northern portion of the site on the Cruzan Mesa would remain undeveloped and designated as a Non-Development/Continuing Use Area. Also, within the northern portion of the site, approximately 22 acres would be preserved as a Mitigation Exchange Area for 22 acres of preserve area within adjacent recorded Tract 46018. G2-1

We prepared the following statements and comments pursuant to our authority as Trustee Agency with jurisdiction over natural resources affected by the project under the California Environmental Quality Act (CEQA Section 15386) and Responsible Agency (Section 15381) over those aspects of the proposed project that come under the purview of the California Endangered Species Act (Fish and Game Code Section 2050 et seq.) and Fish and Game Code Section 1600 et seq. regarding impacts to streams and lakes. G2-2

The California Wildlife Action Plan, a recent Department guidance document, identified the following stressors affecting wildlife and habitats within the project area: 1) growth and development; 2) water management conflicts and degradation of aquatic ecosystems; 3) invasive species; 4) altered fire regimes; and 5) recreational pressures. The Department looks forward to working with the County of Los Angeles to minimize impacts to fish and wildlife resources with a focus on these stressors. G2-3

The project site supports 12 vegetation communities including: coastal sage scrub, disturbed coastal sage scrub, coastal sage-chaparral scrub, chaparral, non-native grassland, disturbed, barren, holly-leaved cherry scrub, southern vernal pool, developed, sycamore riparian woodland G2-4

and southern willow scrub. The dominant communities on the site are coastal sage scrub and mixed coastal sage–chaparral scrub. These communities are interspersed to varying degrees within the project site and provide habitat for various wildlife species. **G2-4 Cont'd**

According to Appendix D-1, the Biological Resources Assessment (BRA) of the DEIR, the federally listed species identified, or with the potential to occur on-site include: the federally endangered Nevin's barberry (Berberis nevinii), slender-horned spineflower (Dodecahema leptoceras), California orcutt grass (Orcuttia californica), Riverside fairy shrimp (Streptocephalus woottoni), San Diego fairy shrimp (Branchinecta sandiegonensis), unarmored threespine stickleback (Gasterosteus aculeatus williamsoni), arroyo toad (Bufo californicus), least Bell's vireo (Vireo bellii pusillus), and southwestern willow flycatcher (Empidonax traillii extimus); the threatened spreading navarretia (Navarretia fossalis), vernal pool fairy shrimp (Branchinecta lynchi), Santa Ana sucker (Catostomus santaanae), California red-legged frog (Rana aurora draytonii), and coastal California gnatcatcher (Polioptila californica); and the candidate San Fernando Valley spineflower (Chorizanthe parryi var. fernandina). **G2-5**

This letter includes our comments regarding the federally listed species you identified, as well as endangered California condor (Gymnogyps californianus) and Quino checkerspot butterfly (Euphydryas editha quino) as they have the potential to occur within the project site.

The Department has the following concerns regarding the potential impacts to sensitive species caused by implementation of the project. **G2-6**

Surveys

The Department concurs with a letter from the U.S. Fish and Wildlife Service commenting on this project, dated September 14, 2009 (FWS letter), that information regarding the location of all biological surveys conducted within Skyline Ranch should be disclosed in the DEIR. To facilitate the analysis of potential biological impacts, the entire Skyline Ranch site should be surveyed. It is especially important to survey portions of the site outside of the development footprint if areas not proposed for development are to be conserved for mitigation purposes pursuant to CEQA. **G2-7**

Most of the sensitive plant surveys were conducted in the spring of 2003 and 2005. While we recognize sensitive plant surveys require a substantial commitment of resources, it should be noted that surveys conducted six years ago should not be relied upon to characterize the extent of current site occupation by sensitive plant species.

To enable Department staff to adequately review and comment on the proposed project we recommend the following information, where applicable, be included in the environmental impact report: **G2-8**

1. A complete, recent assessment of flora and fauna within and adjacent to the project area, with particular emphasis upon identifying endangered, threatened, and locally unique species and sensitive habitats (Attachment 1). Depending upon survey protocols used in the above referenced reports, the recent surveys may be adequate. **G2-9**

   a. A thorough recent assessment of rare plants and rare natural communities, following the Department's Guidelines for Assessing Impacts to Rare Plants and Rare Natural Communities.

b. A complete, recent assessment of sensitive fish, wildlife, reptile, and amphibian species. Seasonal variations in use of the project area should also be addressed. Recent, focused, species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with the Department and U.S. Fish and Wildlife Service. **G2-9 Cont'd**

c. The Department considers Rare Natural Communities as threatened habitats having both regional and local significance. Thus, these communities should be fully avoided and otherwise protected from project-related impacts (Attachment 2).

2. Impacts to migratory wildlife affected by the project should be fully evaluated including proposals to remove/disturb native and ornamental landscaping and other nesting habitat for native birds. Impact evaluation may also include such elements as migratory butterfly roost sites and neo-tropical bird and waterfowl stop-over and staging sites. All migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R. Section 10.13). Sections 3503, 3503.5 and 3513 of the California Fish and Game Code prohibit take of birds and their active nests, including raptors and other migratory nongame birds as listed under the MBTA. Proposed project activities (including disturbances to vegetation) should take place outside of the breeding bird season (February 1- September 1) to avoid take (including disturbances which would cause abandonment of active nests containing eggs and/or young). If project activities cannot avoid the breeding bird season, nest surveys should be conducted and active nests should be avoided and provided with a minimum buffer as determined by a biological monitor (the Department recommends a minimum 500-foot buffer for all active raptor nests). **G2-10**

3. Impacts to all habitats from City or County required Fuel Modification Zones (FMZ). Areas slated as mitigation for loss of habitat shall not occur within the FMZ. **G2-11**

4. The Department generally does not support the use of relocation, salvage, and/or transplantation as mitigation for impacts to rare, threatened, or endangered species. Department studies have shown that these efforts are experimental in nature and largely unsuccessful. **G2-12**

5. A California Endangered Species Act (CESA) Permit must be obtained if the project has the potential to result in "take" of species of plants or animals listed under CESA, either during construction or over the life of the project. CESA Permits are issued to conserve, protect, enhance, and restore State-listed threatened or endangered species and their habitats. Early consultation is encouraged, as significant modification to the proposed project and mitigation measures may be required in order to obtain a CESA Permit. Revisions to the Fish and Game Code, effective January 1998, require that the Department issue a separate CEQA document for the issuance of a CESA permit unless the project CEQA document addresses all project impacts to listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of a CESA permit. For these reasons, the following information is requested: **G2-13**

a. Biological mitigation monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA Permit.

b. A Department-approved Mitigation Agreement and Mitigation Plan are required for plants listed as rare under the Native Plant Protection Act.

6. The Department opposes the elimination of watercourses (including concrete channels) and/or the canalization of natural and manmade drainages or conversion to subsurface drains. All wetlands and watercourses, whether intermittent, ephemeral, or perennial, must be retained and provided with substantial setbacks which preserve the riparian and aquatic habitat values and maintain their value to on-site and off-site wildlife populations. The Department recommends a minimum natural buffer of 100 feet from the outside edge of the riparian zone on each side of drainage.

a. The Department requires a Streambed Alteration Agreement (SAA), pursuant to Section 1600 et seq. of the Fish and Game Code, with the applicant prior to any direct or indirect impact to a lake or stream bed, bank or channel or associated riparian resources. The Department's issuance of a SAA may be a project that is subject to CEQA. To facilitate our issuance of the Agreement when CEQA applies, the Department as a responsible agency under CEQA may consider the local jurisdiction's (Lead Agency) document for the project. To minimize additional requirements by the Department under CEQA the document should fully identify the potential impacts to the lake, stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the Agreement. Early consultation is recommended, since modification of the proposed project may be required to avoid or reduce impacts to fish and wildlife resources. G2-14

The Department concurs with the FWS letter regarding the California Natural Diversity Database (CNDDB) and its role in determining which species may occur onsite. Due to recent observations of coastal California gnatcatcher (CCG), the Department recommends a 2009 search of the CNDDB be conducted by the applicant and the BRA be updated. The Department concurs with the FWS letter that there have been observations of CCG in the proposed project environs. Surveys should be conducted for CCG according to FWS protocol immediately prior to project-related activities, including vegetation removal and construction. The Department also concurs with the FWS letter that protocol-level surveys be conducted over the entire Skyline Ranch site where suitable habitat exists to allow the DEIR to adequately address the direct and indirect effects of the project on the CCG. G2-15

The Department recommends that Least Bell's vireo protocol-level surveys be conducted in suitable habitat within the proposed project site including proposed open space dedication areas. As stated in the FWS letter, least Bell's vireos are tied to riparian habitat for nesting, however they have been observed extending their activities into adjacent upland habitats. Least Bell's vireos along the edges of riparian corridors maintain territories that incorporate both riparian and non riparian habitat, including coastal sage scrub. According to information in the BRA, suitable habitat may exist on the proposed development site, and if so, impacts to the least Bell's vireo should be addressed in the DEIR. At a minimum, all potential least Bell's vireo habitat should be assessed and reported to the FWS and the Department. G2-16

Proposed Land Uses

The Department applauds the proposal to set aside 1,551 acres of the project area for on-site mitigation and open space conservation. The Department recommends that the DEIR further clarify how the Skyline Ranch Conservation Area (SRCA) will be preserved. The Department recommends that an open space conservation plan be developed that includes all open space properties proposed in the project. Within the conservation plan, details of land use should be proposed. This plan would allow sensitive biological resources to be identified and protected G2-17

while identifying potential areas that could provide low impact outdoor public uses. The Department concurs with the FWS letter that the Cruzan Mesa is a biologically diverse system. As stated in the DEIR, this area supports three federally listed species: the vernal pool fairy shrimp, California orcutt grass, and spreading navarretia. The Department recommends that strict conservation guidelines for this area be detailed in an open space conservation plan. **G2-17 Cont'd**

Alternatives

The Department concurs with the FWS letter regarding alternatives. The Reduced Project B Alternative would reduce the size of the currently proposed project in the southern portion of Skyline Ranch, and would not develop on the Cruzan Mesa. As stated above, the Cruzan Mesa is a biologically significant resource area and we agree with the DEIR's determination that the Reduced Project B would be the environmentally superior alternative that meets the project objectives. The Department recommends that the applicant pursue this development alternative. **G2-18**

In summary, the Department concurs with the FWS letter that the DEIR is lacking in the specificity of information regarding the presence of sensitive species and biological resources needed to accurately evaluate and characterize the impacts of the project. The Department recommends that this information be gathered for evaluation by the applicant and the County of Los Angeles to facilitate a full analysis of potential biological impacts. **G2-19**

Thank you for the opportunity to comment on this DMND. Please contact Mr. Dan Blankenship, Staff Environmental Scientist, at (661) 259-3750 if you should have any questions and for further coordination on the proposed project.

Sincerely,

Edmund Pert
Regional Manager
South Coast Region

Attachments

cc: Ms. Helen Birss, Los Alamitos
Ms. Betty Courtney, Newhall
Mr. Dan Blankenship, Newhall
State Clearinghouse, Sacramento

From: Helen Birss
To: Duarte, Dolores
CC: Blankenship, Daniel; Courtney, Betty
Date: 11/3/2009 3:31 PM
Subject: Re: NOC Skyline Ranch Project DEIR, Santa Clarita
Attachments: CEQA DEIR Skyline Ranch Project Santa Clarita SCH 2004101090.hb.doc

Hi Dolores,
The attached letter has been reviewed and is ready for formatting and Ed's signature. This can go out tomorrow.

Dan, please confirm that this needs both attachments 1 and 2.

Thanks,
Helen

G2-20

>>> Daniel Blankenship 10/19/2009 8:32 AM >>>
Hi Helen, Hope all is going well. I have prepared a comment letter for this project based on concerns that the FWS has with the project. The document didn't make it to me until the filing closed but Betty and I think it is appropriate to go on record with our concerns in order to stay at the table with this project. The project will set aside approximately 1500 acres of open space. Please let me know if you have any questions. Thanks, Dan

Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities

State of California
THE RESOURCES AGENCY
Department of Fish and Game
December 9, 1983
Revised May 8, 2000

The following recommendations are intended to help those who prepare and review environmental documents determine **when** a botanical survey is needed, **who** should be considered qualified to conduct such surveys, **how** field surveys should be conducted, and **what** information should be contained in the survey report. The Department may recommend that lead agencies not accept the results of surveys that are not conducted according to these guidelines.

1. Botanical surveys are conducted in order to determine the environmental effects of proposed projects on all rare, threatened, and endangered plants and plant communities. Rare, threatened, and endangered plants are not necessarily limited to those species which have been "listed" by state and federal agencies but should include any species that, based on all available data, can be shown to be rare, threatened, and/or endangered under the following definitions:

   A species, subspecies, or variety of plant is "endangered" when the prospects of its survival and reproduction are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, over-exploitation, predation, competition, or disease. A plant is "threatened" when it is likely to become endangered in the foreseeable future in the absence of protection measures. A plant is "rare" when, although not presently threatened with extinction, the species, subspecies, or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens. G2-21

   Rare natural communities are those communities that are of highly limited distribution. These communities may or may not contain rare, threatened, or endangered species. The most current version of the California Natural Diversity Database's List of California Terrestrial Natural Communities may be used as a guide to the names and status of communities.

2. It is appropriate to conduct a botanical field survey to determine if, or to the extent that, rare, threatened, or endangered plants will be affected by a proposed project when:

   a. Natural vegetation occurs on the site, it is unknown if rare, threatened, or endangered plants or habitats occur on the site, and the project has the potential for direct or indirect effects on vegetation; or
   b. Rare plants have historically been identified on the project site, but adequate information for impact assessment is lacking.

3. Botanical consultants should possess the following qualifications:

   a. Experience conducting floristic field surveys;
   b. Knowledge of plant taxonomy and plant community ecology;
   c. Familiarity with the plants of the area, including rare, threatened, and endangered species;
   d. Familiarity with the appropriate state and federal statutes related to plants and plant collecting; and,
   e. Experience with analyzing impacts of development on native plant species and communities.

4. Field surveys should be conducted in a manner that will locate any rare, threatened, or endangered species that may be present. Specifically, rare, threatened, or endangered plant surveys should be:

   a. Conducted in the field at the proper time of year when rare, threatened, or endangered species are both evident and identifiable. Usually, this is when the plants are flowering.

When rare, threatened, or endangered plants are known to occur in the type(s) of habitat present in the project area, nearby accessible occurrences of the plants (reference sites) should be observed to determine that the species are identifiable at the time of the survey.

b. Floristic in nature. A floristic survey requires that every plant observed be identified to the extent necessary to determine its rarity and listing status. In addition, a sufficient number of visits spaced throughout the growing season are necessary to accurately determine what plants exist on the site. In order to properly characterize the site and document the completeness of the survey, a complete list of plants observed on the site should be included in every botanical survey report.

c. Conducted in a manner that is consistent with conservation ethics. Collections (voucher specimens) of rare, threatened, or endangered species, or suspected rare, threatened, or endangered species should be made only when such actions would not jeopardize the continued existence of the population and in accordance with applicable state and federal permit requirements. A collecting permit from the Habitat Conservation Planning Branch of DFG is required for collection of state-listed plant species. Voucher specimens should be deposited at recognized public herbaria for future reference. Photography should be used to document plant identification and habitat whenever possible, but especially when the population cannot withstand collection of voucher specimens.

d. Conducted using systematic field techniques in all habitats of the site to ensure a thorough coverage of potential impact areas.

e. Well documented. When a rare, threatened, or endangered plant (or rare plant community) is located, a California Native Species (or Community) Field Survey Form or equivalent written form, accompanied by a copy of the appropriate portion of a 7.5 minute topographic map with the occurrence mapped, should be completed and submitted to the Natural Diversity Database. Locations may be best documented using global positioning systems (GPS) and presented in map and digital forms as these tools become more accessible.

G2-21 Cont'd

5. Reports of botanical field surveys should be included in or with environmental assessments, negative declarations and mitigated negative declarations, Timber Harvesting Plans (THPs), EIR's, and EIS's, and should contain the following information:

a. Project description, including a detailed map of the project location and study area.
b. A written description of biological setting referencing the community nomenclature used and a vegetation map.
c. Detailed description of survey methodology.
d. Dates of field surveys and total person-hours spent on field surveys.
e. Results of field survey including detailed maps and specific location data for each plant population found. Investigators are encouraged to provide GPS data and maps documenting population boundaries.
f. An assessment of potential impacts. This should include a map showing the distribution of plants in relation to proposed activities.
g. Discussion of the significance of rare, threatened, or endangered plant populations in the project area considering nearby populations and total species distribution.
h. Recommended measures to avoid impacts.
i. A list of all plants observed on the project area. Plants should be identified to the taxonomic level necessary to determine whether or not they are rare, threatened or endangered.
j. Description of reference site(s) visited and phenological development of rare, threatened, or endangered plant(s).
k. Copies of all California Native Species Field Survey Forms or Natural Community Field Survey Forms.
l. Name of field investigator(s).
j. References cited, persons contacted, herbaria visited, and the location of voucher specimens.

Sensitivity of Top Priority Rare Natural Communities in Southern California

Sensitivity rankings are determined by the Department of Fish and Game, California Natural Diversity Data Base and based on either number of known occurrences (locations) and/or amount of habitat remaining (acreage). The three rankings used for these top priority rare natural communities are as follows:

S1.# Fewer than 6 known locations and/or on fewer than 2,000 acres of habitat remaining.

S2.# Occurs in 6-20 known locations and/or 2,000-10,000 acres of habitat remaining.

S3.# Occurs in 21-100-known locations and/or 10,000-50,000 acres of habitat remaining.

The number to the right of the decimal point after the ranking refers to the degree of threat posed to that natural community regardless of the ranking. For example:

S1.1 = very threatened
S2.2 = threatened
S3.3 = no current threats known

Sensitivity Rankings (February 1992)

G2-22

Rank	Community Name
S1.1	Mojave Riparian Forest
	Sonoran Cottonwood Willow Riparian
	Mesquite Bosque
	Elephant Tree Woodland
	Crucifixion Thorn Woodland
	Allthorn Woodland
	Arizonan Woodland
	Southern California Walnut Forest
	Mainland Cherry Forest
	Southern Bishop Pine Forest
	Torrey Pine Forest
	Desert Mountain White Fir Forest
	Southern Dune Scrub
	Southern Coastal Bluff Scrub
	Maritime Succulent Scrub
	Riversidean Alluvial Fan Sage Scrub
	Southern Maritime Chaparral
	Valley Needlegrass Grassland
	Great Basin Grassland
	Mojave Desert Grassland
	Pebble Plains
	Southern Sedge Bog
	Cismontane Alkali Marsh

S1.2	Southern Foredunes Mono Pumice Flat Southern Interior Basalt Flow Vernal Pool
S2.1	Venturan Coastal Sage Scrub Diegan Coastal Sage Scrub Riversidean Upland Coastal Sage Scrub Riversidean Desert Sage Scrub Sagebrush Steppe Desert Sink Scrub Mafic Southern Mixed Chaparral San Diego Mesa Hardpan Vernal Pool San Diego Mesa Claypan Vernal Pool Alkali Meadow Southern Coastal Salt Marsh Coastal Brackish Marsh Transmontane Alkali Marsh Coastal and Valley Freshwater Marsh Southern Arroyo Willow Riparian Forest Southern Willow Scrub Modoc-Great Basin Cottonwood Willow Riparian Modoc-Great Basin Riparian Scrub Mojave Desert Wash Scrub Engelmann Oak Woodland Open Engelmann Oak Woodland Closed Engelmann Oak Woodland Island Oak Woodland California Walnut Woodland Island Ironwood Forest Island Cherry Forest Southern Interior Cypress Forest Bigcone Spruce-Canyon Oak Forest
S2.2	Active Coastal Dunes Active Desert Dunes Stabilized and Partially Stabilized Desert Dunes Stabilized and Partially Stabilized Desert Sandfield Mojave Mixed Steppe Transmontane Freshwater Marsh Coulter Pine Forest Southern California Fellfield White Mountains Fellfield
S2.3	Bristlecone Pine Forest Limber Pine Forest

G2-22
Cont'd

LETTER NO. G2

California Department of Fish and Game
Edmund Pert, Regional Manager
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123

RESPONSE NO. G2-1

The comment is noted. This information is presented in Chapter 2.0, Project Description and Section 4.C, Biological Resources of the Draft EIR. However, it is noted that the proposed elementary school site is 11 acres, rather than 22 acres, as stated by the commenter.

RESPONSE NO. G2-2

The comment states roles and responsibilities of the California Department of Fish and Game as a Trustee Agency and Responsible Agency.

RESPONSE NO. G2-3

The comment summarizes biological issues referenced in the California Wildlife Action Plan and is not a comment on the contents or adequacy of the Draft EIR and therefore no further response is required. However, the Draft EIR addressed these issues in Section 4.C Biological Resources with supporting technical data and analysis provided in Appendix D.

RESPONSE NO. G2-4

The comment is noted. The information is presented in Section 4.C, Biological Resources of the Draft EIR.

RESPONSE NO. G2-5

The content of this comment is similar to comment A2-3 and provides a context for the federally-listed species that are the subject of the letter. No specific comments are provided regarding the California condor or Quino checkerspot butterfly. However, comments on these

species presented by the U.S. Fish and Wildlife Service are addressed in Responses to Comments A2-16 and A2-10, respectively.

RESPONSE NO. G2-6

Responses to these concerns are provided below in Responses to Comments G2-7 through G2-19.

RESPONSE NO. G2-7

Please see Responses to Comments A2-5, A2-6, A2-7, A2-12, A2-13, and A2-14 regarding the location, extent, and timing of the biological surveys conducted on the project site and presented in the Draft EIR. As stated in these responses, surveys were conducted over the entire site, including areas outside the development footprint, based on established protocols.

Concerning the reliability of using data derived from sensitive plant surveys conducted in 2003 and 2005, it should be noted that the reliability of plant surveys is highly dependent on rainfall totals during the season they were conducted. According to data collected at the Los Angeles Civic Center and presented in The Los Angeles On-Line Almanac, the 130-year average seasonal rainfall is 15.04 inches. During the 2002-2003 rainy season, 16.42 inches of rain fell at the Civic Center station, indicating slightly higher than normal precipitation. During the 2004-2005 rainy season, 37.96 inches of rain fell at the season, indicating a very wet year. In both cases, conditions for sensitive plant growth are considered to be good to excellent case scenarios that reflect best case conditions for conducting surveys. In addition, surveys conducted prior to the 2007 wildfire represent optimal conditions within the burn area as it may take several years for habitat within this area to fully recover, as stated in Response to Comment G2-9. Therefore, the data presented in the Draft EIR are considered to be accurate and reliable.

RESPONSE NO. G2-8

Please see Responses to Comments G2-9 through G2-19 below regarding the requested information, which has been adequately addressed in the Draft EIR**.**

RESPONSE NO. G2-9

In terms of its approach, focus, and documentation, the Draft EIR's content is consistent with the California Department of Fish and Game's Guidelines for Assessing Impacts to Rare Plants and Rare Natural Communities (attached as Comment G2-21). The Draft EIR also presents the

results of the most recent reliable field surveys for sensitive fish and wildlife since habitats had not recovered adequately from the 2007 wildfire to warrant updated surveys prior to publication of the Draft EIR. It should be noted that due to the well documented fire ecology of chaparral and sage scrub vegetation, the recovery of such habitats may take years to achieve the habitat diversity and structure (and, therefore, the plant and wildlife species holding capacity) of the habitat present at the time of the surveys that were conducted before the wildfire occurred. Finally, impacts on Rare Natural Communities in Southern California (see Comment G2-22) are avoided or minimized to a less than significant level through implementation of Mitigation Measures 4.C-1 and 4.C-2. For a more detailed description of biological surveys conducted for the Draft EIR refer to Responses A2-5 through A2-16.

RESPONSE NO. G2-10

The Draft EIR addressed wildlife movement/migratory species in Section 4.C, Biological Resources with supporting technical data and analysis provided in Appendix D-1. The analysis addressed impacts regarding wildlife movement in the project vicinity, habitat for migratory birds (i.e. resting and foraging habitat for migratory waterfowl and shorebirds on Cruzan Mesa), and nesting birds. The analysis identified a potentially significant impact to nesting birds which would be reduced to a less-than-significant level with implementation of Mitigation Measure 4.C-3 which would avoid vegetation clearance during the nesting season or require pre-construction surveys and nest avoidance of 100 feet to 500 feet as determined by the monitoring biologist. As presented in the comment, a minimum 500-foot buffer for all active raptor nests will be considered by the monitoring biologist. However, the presence of intervening topography and/or vegetation may serve as buffering agents that would allow a reduced setback. Also, to clarify the findings presented in Section 4.C, Biological Resources of the Draft EIR, no migratory butterfly roosts or noteworthy migratory bird stop-over or staging habitats are located within the area proposed for development.

RESPONSE NO. G2-11

Impacts to all habitats as a result of the County's fuel modification requirements are described in Table 4.C-5 (footnote b) and Mitigation Measure 4.C-1 of the Draft EIR. Areas slated for mitigation are within the Skyline Ranch Conservation Area (SRCA) and do not include habitats impacted by fuel modification zones. As stated in Mitigation Measure 4.C-1, Item 1 on page 4.C-72 of the Draft EIR, 642.1 acres (inclusive of fuel modification) would be impacted and 1,355 acres within the SRCA would be preserved.

RESPONSE NO. G2-12

The comment is noted; however, use of relocation, salvage, and/or transplantation as mitigation is not proposed in the Draft EIR.

RESPONSE NO. G2-13

The comment is noted. No impacts to any species covered by the California Endangered Species Act (CESA) will occur; and thus no CESA Permit will be necessary. No impacts to plants listed as rare under the Native Plant Protection Act will occur so no California Department of Fish and Game (CDFG)-approved Mitigation Agreement and Mitigation Plan is required.

RESPONSE NO. G2-14

A discussion of impacts to drainage features regulated by the CDFG and therefore subject to CEQA is provided on pages 4.C-66 through 4.C-68 of the Draft EIR and mitigation to impacts on 9.30 acres of California Department of Fish and Game jurisdiction is presented in Mitigation Measure 4.C-2 with additional details provided in the Habitat Mitigation and Monitoring Plan (HMMP) included as Appendix D-2 of the Draft EIR.

RESPONSE NO. G2-15

Please see Responses to Comments A2-8, A2-11, A2-12, A2-13, and A2-14 regarding the California Natural Diversity Database and the presence of the coastal California gnatcatcher.

RESPONSE NO. G2-16

Please refer to Response A2-15 regarding additional surveys to identify least Bell's vireo habitat on the project site. As stated in that response, no suitable habitat for the least Bell's vireo was identified in the Biological Resources Assessment (Appendix D-1 of the Draft EIR) and no further analysis is required.

RESPONSE NO. G2-17

As described in Mitigation Measure 4.C-1, on page 4.C-72, in Section 4.C, Biological Resources, of the Draft EIR, biological resources within the SRCA would be preserved through either a Declaration of Restrictions, Conservation Easement, or dedication or transfer of the land to

a qualified conservation organization approved by the County and include the establishment and funding of a long-term maintenance and management program. The program requires the use of signage, and where appropriate, other management practices to discourage off-road vehicles, domestic pets, and other activities harmful to natural lands. Mitigation Measure 4.C-1 provides a series of performance standards that must be met to ensure significant impacts are avoided. Please see Responses to Comment A2-18, A2-19, and A2-20 regarding protection of the Cruzan Mesa, which is proposed by the County as a Significant Ecological Area due to the regionally significant resources found on site. As stated in these responses, the portion of the Cruzan Mesa within the SRCA would be protected by the maintenance and management program and Habitat Mitigation and Monitoring Plan as described in Mitigation Measure 4.C-2. Furthermore, vernal pools adjacent to the proposed trail alignment would be protected by fencing.

As previously indicated, filming activities are not part of the proposed project. Because the Non-Development Continuing Use Area is primarily comprised of non-native grasslands, disturbed areas, and disturbed coastal sage scrub, and does not provide in-kind mitigation for impacts to any vegetation community from project development, this area was not included within the SRCA.

RESPONSE NO. G2-18

The comments regarding the project alternatives and EIR identification of and Department support for Reduced Project Alternative B as an environmentally superior alternative are noted for the consideration of the decision-makers. However, it should be clarified that the Draft EIR did not simply indicate that Reduced Project Alternative B meets the project objectives. Rather, it states more specifically in Section 5.A, Alternatives, on page 5-59, that: "…Reduced Project Alternative B would not fulfill certain objectives to the same degree as the proposed project. For example, due to the reduction in the amount of residential development, the Alternative would not increase the supply of housing to serve existing and future needs in the Santa Clarita Valley to the same degree as the proposed project. This Alternative would also not fulfill park and recreation objectives to the same extent as the proposed project, since no trail easement would be provided to support the extension of the County Trail System. Additionally, Reduced Project Alternative B would not fulfill the mobility objective of providing for the major highway improvement involving the Whites Canyon Extension to Sierra Highway, as proposed by the project and conditionally approved and shown on the County's Draft Highway Plan. Without this highway improvement as part of the project, the County's ability to complete such a connection could be compromised, as it would not be substantially funded by the project and its implementation, if it were to occur, could be significantly delayed."

RESPONSE NO. G2-19

Please see Responses to Comments G2-7 through G2-18 and U.S. Fish and Wildlife Letter A2 regarding the issues raised by the commenter.

RESPONSE NO. G2-20

Comment noted.

RESPONSE NO. G2-21

Please see Response to Comment G2-9 regarding the attached Guidelines for Assessing the Effects of Proposed Project on Rare, Threatened, and Endangered Plants and Natural Communities.

RESPONSE NO. G2-22

Please see Response to Comment G2-9 regarding the attached Sensitivity of Top Priority Rare Natural Communities in Southern California.

Letter G3

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

GAIL FARBER, 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

November 10, 2009

IN REPLY PLEASE REFER TO FILE: LD-1

TO: Paul McCarthy
Department of Regional Planning

Attention Michele Bush

FROM: for Steve Burger
Land Development Division
Department of Public Works

DRAFT ENVIRONMENTAL IMPACT REPORT (DEIR)
SKYLINE RANCH
PROJECT NO. 04-075
STATE CLEARINGHOUSE NO. 2004101090

We reviewed the DEIR for the Skyline Ranch project. The project includes residential lots, an approximately 11-acre elementary school site, 10 lots for park areas, 13 debris basins, 4 water tank/booster pumps station, and 25 open space lots. **G3-1**

The following comments are for your consideration:

Services-Traffic

The DEIR shall address the following comments, which were included in our September 18, 2008, letter. Please note the milestone indicated in the September 18, 2008, letter has been revised per comments below. **G3-2**

1. We recommend the project's developer work with the Sulphur Springs Union School District to develop traffic circulation plans and drop-off/pick-up procedures for the proposed school. If possible, we recommend implementing a one-way, counter-clockwise, on-site traffic circulation for any valet service and restricting any site access from Skyline Ranch Road. The traffic circulation plan should include informational packets containing the approved drop-off/pick-up procedures as well as brochures on trip reduction strategies such as carpooling and transit services to minimize traffic generation in the area (the brochures should have specific average vehicle ridership goals for students and staff **G3-3**

members). We also recommend the plan include a mechanism for enforcement and levying of noncompliance penalties. The traffic circulation informational packets and the detailed school site plan shall be reviewed and approved by Public Works prior to the issuance of the Certificate of Occupancy. **G3-3 Cont'd**

2. Caltrans should be consulted for any possible California Environmental Quality Act (CEQA) impacts to the freeway system in the area. Therefore, we ask that you provide Caltrans with a copy of the report so they have an opportunity to review it prior to public circulation. Any written comments received from Caltrans should be submitted to Public Works and included in the DEIR. **G3-4**

3. The City of Santa Clarita should review this document to determine whether they concur with the study's findings of the potential CEQA impacts within its jurisdiction. Any written comments from the City should be submitted to Public Works and included in the DEIR. **G3-5**

If you have any further questions regarding traffic comments, please contact Courtney Sweeney at (626) 300-4721 or by e-mail at csweeney@dpw.lacounty.gov.

Services-Road/Access

We agree with the mitigation summaries relating to the roadways within the County as shown in the DEIR. In addition, the DEIR should disclose the following: **G3-6**

1. Bike lanes are being proposed along Skyline Ranch Road.

2. Approval of the conceptual striping plans and related road plans and permits will be required by Public Works for work within the County's jurisdiction. **G3-7**

If you have any questions regarding road comments, please contact Sam Richards at (626) 458-4921 or by e-mail at srich@dpw.lacounty.gov.

Services-Water/Sewer

Water

1. Santa Clarita Water District is the water purveyor for this area. **G3-8**

2. The DEIR should address the adequacy of the water supply to ensure the capability of water for the project.

3. Submit Will Serve letter from water purveyor(s) that meets the minimum domestic flow requirements as well as fire flow/fire hydrants requirements to Public Works' Land Development Division for review and approval. **G3-8** Cont'd

Sewer

Sewer area study, PC12109AS, dated April 28, 2009, was approved per Mitigation Agreement No. 20090435108 for sewer line upgrade in the City of Santa Clarita. **G3-9**

If you have any questions regarding water and sewer comments, please contact Tony Khalkhali at (626) 458-4921 or by e-mail at tkhalkhali@dpw.lacounty.gov.

Hazards–Others

1. 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, Public Works' Environmental Programs Division must be contacted for required approvals and operating permits. **G3-10**

2. Food service establishments may be required to provide a grease treatment device and will be subject to review and approval by Public Works' Environmental Programs Division. **G3-11**

3. All development and redevelopment projects, which fall into one of the Standard Urban Stormwater Mitigation Plan project types, characteristics, or activities, must obtain the Standard Urban Stormwater Mitigation Plan approval by the appropriate agency. **G3-12**

If you have any questions regarding the environmental comments, please contact Corey Mayne at (626) 458-3524 or by e-mail at cmayne@dpw.lacounty.gov.

If you have any other questions or require additional information, please contact Toan Duong at (626) 458-4945 or by e-mail at tduong@dpw.lacounty.gov.

MA:ca
P:\CEQA\CDM\DRP – Project 04-075_Skyline Ranch_DEIR.doc

LETTER NO. G3

County of Los Angeles Department of Public Works
Steve Burger
Land Development Division
900 South Fremont Avenue
Alhambra, CA 91803

RESPONSE NO. G3-1

The comment is noted. This information is presented in Chapter 2.0, Project Description of the Draft EIR. Responses from the respective divisions are provided in Responses to Comments G3-2 through G3-12 below.

RESPONSE NO. G3-2

Please see Responses G3-3 through G3-5 below. The referenced letter includes comments provided by the Traffic and Lighting Division to the traffic consultant (Austin-Foust Associates, Inc.) on the February 29, 2008 Revised Traffic Impact Analysis. The October 2008 Traffic Impact Analysis was revised based on these comments and is included as Appendix F of the Draft EIR.

RESPONSE NO. G3-3

Comment noted. As indicated on page 2-13 in Chapter 2, Project Description of the Draft EIR, plans for the school will ultimately be developed by the Sulphur Springs School District and will be subject to Title 5 of the California Code of Regulations, which contains standards for school site selection, site planning, and construction of school facilities within the State of California. Once developed, plans for the school would also be subject to environmental review by the District, California Department of Toxic Substances Control, and other State and local agencies, as well as final review and approval by the Division of the State Architect. Furthermore, as stated on page 2-1 of the Traffic Impact Analysis (included as Appendix F of the Draft EIR), a traffic study addressing circulation related to the school site will be prepared and submitted at the time a detailed site plan for the school is developed by the school district. Components of the subsequent school plan and anticipated traffic study would include consideration of the recommendations stated by the commenter.

RESPONSE NO. G3-4

Caltrans was consulted during the CEQA process to determine potential impacts to the freeway system. Specifically, Caltrans provided comments on the project's traffic study to the Department of Public Works in a letter dated July 20, 2004 and included in Appendix A of the Draft EIR, stating that the Department's Traffic Impact Study Guidelines should be referenced and impacts should be identified and mitigated along State Highway 14. The concerns were incorporated as part of the Traffic Impact Analysis (pages 6-13 through 6-18) and Section 4.F, Traffic/Access of the Draft EIR (pages 4.F-32 through 4.F-36 and Mitigation Measure 4.F-3). In addition, a copy of the Draft EIR, including the Traffic Impact Analysis, was sent to Caltrans District 7 via Federal Express on July 27, 2009. No comments were received on the Draft EIR from Caltrans.

RESPONSE NO. G3-5

Mr. Ian Pari, City of Santa Clarita Traffic Department was provided a copy of the Draft EIR, including the Traffic Impact Analysis via courier on July 28, 2009. As noted in the December 3rd and December 10th 2009 staff reports for the Skyline Ranch Report and at the public hearing before the Regional Planning Commission held on December 16, 2009, the applicant, the County Department of Public Works, and City of Santa Clarita are continuing to work together to resolve issues on the design of Skyline Ranch Road. Mitigation for the intersection of Sierra Highway and Soledad Canyon Road has now been resolved between the applicant and City of Santa Clarita Traffic Division. See Response to Comment D2-2 for responses to written comments from the City of Santa Clarita on the Draft EIR regarding pedestrian safety and revisions to the project design. See also Section 2.B, Public Hearing Testimony and Responses, for responses to comments from the City of Santa Clarita presented at the public hearings on September 16th and December 16th 2009.

RESPONSE NO. G3-6

The Draft EIR disclosed that bike lanes are proposed along Skyline Ranch Road in Chapter 2.0, Project Description, page 2-14 and Figures 2-8 and 2-14 and Section 4.P, Parks, page 4.P-11. See also revised street sections presented in Section 3.0, Corrections and Additions to the Draft EIR, in this Final EIR.

RESPONSE NO. G3-7

Comment noted. As stated on page 2-26 in Chapter 2.0, Project Description, all roadways within the project site would be constructed to urban or rural standards as defined by the Department of Public Works. This would include the submissions of plans and permits to the Department of Public Works for review and approval prior to roadway construction for the project. As stated on page 2-17 of the Draft EIR, the realignment of Skyline Ranch Road was conditionally approved by the Department of Public Works on July 19, 2006.

RESPONSE NO. G3-8

The Draft EIR identified the water purveyor, the adequacy of the water supply, and the adequacy of infrastructure in Section 4.I, Water Resources, of the Draft EIR. As stated on pages 4.I-3 and 4.I-4 of the Draft EIR, the Castaic Lake Water Agency (CLWA) is the water wholesaler who treats and distributes water to the Santa Clarita Water Division (SCWD). The project site is within the service area of the SCWD. As concluded on page 4.I-42 of the Draft EIR, based on the best available information provided in the Department of Water Resources 2007 State Water Project (SWP) Delivery Reliability Report, the 2005 Urban Water Management Plan, and the Water Supply Assessment prepared by CLWA's SCWD, impacts to water supply are considered less than significant. However, due to the reduction in SWP supply and current drought conditions in the County, Mitigation Measures 4.I-1 through 4.I-5 are proposed to ensure project consistency with all applicable water conservation plans, programs, and ordinances. Regarding domestic flow and fire flow requirements, based on a preliminary evaluation by the SCWD (see footnotes 85 and 86 on page 4.I-43 of the Draft EIR) the proposed infrastructure would provide adequate water pressure to meet these requirements. A Will Serve letter (i.e., written verification) from the SCWD to indicate the availability of sufficient water supply and water flow will be submitted to the Public Works Land Development Division, Department of Regional Planning, and Fire Department for review and approval prior to filing any final map.

RESPONSE NO. G3-9

Comment noted. Sewer service is analyzed in Section 4.J, Wastewater Disposal of the Draft EIR. As concluded on page 4.J-6 of the Draft EIR, although project impacts on sewer lines and wastewater treatment facilities would be less than significant, due to cumulatively significant impact on the City-owned line sewer line in Sierra Highway resulting from future development in the Mint Canyon area, the project would include the construction of a new 24-inch sewer line to supplement the existing 21-inch line. Construction of this sewer line would mitigate cumulative impacts on sewer conveyance systems to a less than significant level.

RESPONSE NO. G3-10

Comment noted. No construction, installation, modification or removal of underground storage tanks, industrial waste treatment or disposal facilities is proposed as part of the project. Storm water treatment facilities and related permit requirements and approvals are discussed in Section 4.B, Hydrology and Water Quality in the Draft EIR. To avoid impacts on water quality during construction and operation Mitigation Measures 4.B-2, 4.B-3, and 4.B-4, require that an Erosion Control Plan, Notice of Intent, Storm Water Pollution Prevention Plan, Stormwater Quality Management Plan, and Standard Urban Stormwater Mitigation Plan be prepared and submitted to the Los Angeles Department of Public Works, and Los Angeles Regional Control Board for review and approval

RESPONSE NO. G3-11

Comment noted. Any grease treatment device that may be necessary as a result of the operation of the proposed school will be evaluated at the time a detailed site plan is developed by the Sulphur Springs Union School District

RESPONSE NO. G3-12

Comment noted. Please see Response to Comment G3-10 regarding the review and approval of the Standard Urban Stormwater Mitigation Plan (SUSMP) in Section 4.B, Hydrology and Water Quality in the Draft EIR. A Draft SUSMP was included in Appendix C-1 of the Draft EIR and approved by the Department of Public Works on May 13, 2009.

Letter G4

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

SANTA MONICA MOUNTAINS CONSERVANCY
RAMIREZ CANYON PARK
5750 RAMIREZ CANYON ROAD
MALIBU, CALIFORNIA 90265
PHONE (310) 589-3200
FAX (310) 589-3207

October 5, 2009

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

Skyline Ranch Project DEIR Comments
Project No. 04-075 - Tract Map 060922 - SCH No. 2004101090

Dear Planning Commission Members:

The Cruzan Mesa area is an important component of the multiple mountain ranges along the northern edge of the upper Santa Clara River that are ecologically tied to the Rim of the Valley Trail Corridor zone. The Conservancy's December 6, 2004 Notice of Preparation comments were not acknowledged in the Draft Environmental Impact Report (DEIR) so they are hereby incorporated by reference. **G4-1**

Without question any development approved on the subject property will result in unavoidable significant adverse biological impacts. One of those significant impacts will be the loss of hundreds of acres of habitat and a portion of a blueline drainage riparian system. The DEIR refers to this canyon as the unnamed drainage in the southern part of the site. **G4-2**

It is incumbent on the County to make reasonable attempts to reduce ecological impacts if feasible alternatives exist. Reduced Project Alternative B was a good start at such a goal because it preserves one hundred percent of the unnamed drainage in the southern part of the site. However, the alternative is not feasible because it loads too much traffic onto Whites Canyon Road and Bakerton Avenue. The DEIR analysis does not flat out say that this traffic configuration is physically not workable. However, it would result in substantial adverse traffic impacts to several neighborhoods. Reduced Project Alternative A has too many strikes against it in regards to significant impacts to be feasible. Both alternatives produce secondary significant impacts and both are designed to be doomed politically. **G4-3**

The DEIR is deficient for not including an adequate range of feasible reduced development alternatives. The Final EIR must include the following alternative project for the FEIR to not be deficient. **G4-4**

DEC - 7 2009

Need for Reduced Project Alternative C

This project should be called the Reduced Project Alternative C. The project would be exactly the same as the proposed project in regards to including the Whites Canyon Extension to Sierra Highway. However the footprint of this alternative project would differ from the proposed project by not filling any of unnamed drainage in the southern part of the site other than to the extent necessary to achieve the desired Whites Canyon Extension. It would thus follow the same eastern boundary of the Reduced Project Alternative B. This alternative project footprint provides significant avoidance of a blueline drainage and it meets all of the project objectives. **G4-5**

The alternative project would also provide between 950 and 1,000 units of the same size in the proposed project. It would avoid the need for one of the offsite grading areas. This alterative cannot be dismissed as infeasible simply because it does not provide enough housing to prevent additional housing from occurring further into undeveloped land on other properties in the future. There is no way to define that number and in any case it could then be construed that the whole site should be developed. **G4-6**

The northeastern bulge in the proposed project that fills in a long section of the unnamed blueline stream canyon was conveniently put in to add extra units. If Reduced Project Alternative B is physically feasible, then the Conservancy proposed Reduced Project Alternative C is also physically feasible. The fill that would have gone into the above described northeastern bulge of units can be used for the Whites Canyon Extension. If Alternative B is not physically feasible then that confirms that the DEIR range of alternatives is inadequate. Alternatives must be physically feasible. **G4-7**

In the FEIR, the above described Reduced Project Alternative C must supplant Reduced Project Alternative B as the environmentally superior alternative. Reduced Project Alternative B is not a feasible alternative (because of traffic circulation) and therefore not a valid alternative. The range of FEIR alternatives must be expanded accordingly. **G4-8**

Fee Simple Open Space Dedication a Condition of Grading Permits or Map Recordation

We urge the Commission to require that all of the undeveloped land located outside of the private lots and public rights-of-ways be dedicated in fee simple to a public park agency. Any place where fuel modification is required, the HOA should retain a permanent easement to allow brush clearance consistent with written Los Angeles County Fire Department requirements. To adequately mitigate the project impacts to natural land, **G4-9**

that complete fee simple dedication should occur as a precondition to the issuance of any grading permits or map recordation. **G4-9 Cont'd**

That open space dedication should include all of the site including the area being used for movie production. The entity managing the open space including the Cruzan Mesa vernal pools needs to control all portions of the property that can affect the pools. In addition it is better to have unified management of the open space by a public agency with the public's interest at the forefront. **G4-10**

We concur with the County staff recommendation that the County Biologist work the future land management agency to come up with a range of acceptable filming activities and footprints. The Conservancy supports responsible filming on public lands and makes all efforts to accommodate the needs of the film industry on its multiple properties. **G4-11**

The Conservancy defers to the County if the Department of Parks and Recreation wants to take the land. If not, the Mountains Recreation and Conservation Authority (MRCA) is the obvious choice. In the case of the nearby Spring Canyon tract open space dedication, the Department of Parks and Recreation was not assertive about making sure a permanent maintenance funding source was built into the project approval. If the Department is not definitely and aggressively willing to make that request for permanent maintenance funding to prevent the open space maintenance burden from falling on the rest of the County tax payers, we urge the Commission to require that a permanent funding source and title to the open space go to the MRCA. **G4-12**

Open Space Management Funding

The minimum 1500-acre open space preserve that will result from a project approval on the subject property is the mitigation center piece for a project that proposes over 20 million cubic yards of grading. For that mitigation center piece to provide a quality public experience and to continue to improve in ecological condition, a permanent funding source is imperative. **G4-13**

Filming may produce a variable stream of funding for the management agency but a consistent funding source not dependent on resource disturbance is the only prudent mechanism to protect the public interest. Filming revenue is better suited to go towards habitat restoration.

That open space maintenance funding must be in the form of a Landscape Maintenance District or a Community Facilities District. No other mechanism provides an adequate guarantee to the public. In contrast HOAs can delay funding. **G4-14**

How much funding is necessary? We throw the question back to the Planning Commission. How important is it for public users of the 1500-plus acres of open space to have well maintained trails, restrooms, trash pick up, and ranger patrols? The Commission gets one shot at it in its recommendation to the Board of Supervisors, and we urge the Commission to require a dollar amount that guarantees a safe and fulfilling public experience.

If the MRCA were to patrol the land with its sworn law enforcement rangers at current rates, $35,000 annually would provide ten weekly hours of ranger time devoted to the site for 52 weeks a year. To continue that level of service an inflation adjustor must be included. **G4-15**

If porta-potty restrooms are to be included the monthly rental and cleaning cost would also need to be added with an inflation adjustor.

We also recommend an initial one time start up payment of $20-30,000 for adequate gates, fencing, signage, trail refurbishment, focused noxious weed control, and trash clean up.

Suitability of the MRCA to Manage the Property

The MRCA manages over 60,000 acres of open space including approximately 8,000 acres in the upper Santa Clara River watershed. To use the MRCA for maintenance is a simple turn key operation.

The MRCA rangers are sworn peace officers with wildland fire training and naturalist training. The MRCA has six staff ecologists to address management and restoration issues. In addition the MRCA has a full time habitat restoration crew currently doing long term restoration in the Elsmere, Whitney, Pico and Soledad Canyon tributaries of the upper Santa Clara River. The MRCA manages the Tierra Rejada vernal pool in Moorpark with the Endangered Riverside fairy shrimp. The MRCA staff includes a biologist certified to survey for this species in the years the vernal pool adequately fills. **G4-16**

The MRCA also has staff devoted to filming activities. Filming occurs on many MRCA-owned and managed properties on a year-round basis.

Please address any questions to Paul Edelman of our staff at the above address and by phone at (310) 589-3200 ext. 128.

Sincerely,

RONALD P. SCHAFER
Chairperson

LETTER NO. G4

Santa Monica Mountains Conservancy
Ronald P. Schafer, Chairperson
Ramirez Canyon Park
5750 Ramirez Canyon Road
Malibu, CA 90265

RESPONSE NO. G4-1

Comment noted. While the Draft EIR does not explicitly acknowledge the Conservancy's Notice of Preparation comments, the comments were considered in preparation of the Draft EIR and were included as part of Appendix A of the Draft EIR.

RESPONSE NO. G4-2

The comprehensive analyses of biological resources provided in Section 4.C, Biological Resources, and the associated technical reports provided in Appendix D of the Draft EIR, does not indentify impacts on biological resources as significant and unavoidable as suggested by the commenter. Rather, the Draft EIR identified potentially significant impacts on sensitive plant species, riparian habitat, nesting birds, and oak trees prior to mitigation and concluded that all of the impacts would be mitigated to less than significant levels after mitigation. The mitigation measures provided in the Draft EIR are extensive. Mitigation Measure 4.C-1 addresses the establishment of a 1,355-acre Skyline Ranch Conservation Area (SRCA), sets performance standards for the area and lays out management and funding responsibilities. Mitigation Measure 4.C-2 provides for implementation of a Habitat Mitigation and Monitoring Plan (HMMP) that preserves the 1,355-acre SRCA, requires the preservation of 1.53 acres of southern vernal pool and artificial pool habitats that are subject to RWQCB jurisdiction, and requires the establishment of 7.27 acres of sycamore/cottonwood riparian woodland within Plum Canyon. The measure sets out specific criteria and standards for the implementation of the HMMP. Mitigation Measure 4.C-3 addresses potential impacts to nesting birds protected by the Migratory Bird Treaty Act. Mitigation Measure 4.C-4 requires tree planting with specific performance requirements. Mitigation Measure 4.C-5 requires the use of native plant species adjacent to the open space areas.

RESPONSE NO. G4-3

As further described in Chapter 5, Alternatives, of the Draft EIR, Reduced Project Alternatives A and B were selected for evaluation after consideration of a number of alternatives

that were ultimately not carried forward due to failure to meet project objectives and/or determinations that they would not be feasible. The alternatives were not designed as the commentor suggests, to be doomed politically, rather, the alternatives evaluated in the Draft EIR were selected for further consideration because they were capable of reducing and avoiding significant impacts, supporting to some degree the objectives of the proposed project, and were viewed as appropriate to help foster the decision-making process. The alternatives were also selected after considering comments on the Notice of Preparation, including comments from the Conservancy that suggested an alternative that would avoid impacts on the drainage in the southern portion of the site. This suggestion is reflected under Reduced Project Alternative B.

RESPONSE NO. G4-4

The Draft EIR considered a reasonable range of alternatives. As indicated in CEQA Guidelines Section 15126.6(a), an EIR need not consider every conceivable alternative to a project but a reasonable range of potentially feasible alternatives that foster informed decision-making. Furthermore, an EIR is not required to consider alternatives which are infeasible.

RESPONSE NO. G4-5

The comment is made that a new alternative, Reduced Project Alternative C, must be evaluated. The suggested alternative is proposed with the intent to avoid filling of the unnamed drainage in the southern part of the site while still allowing for construction of the Whites Canyon Extension to Sierra Highway. For a number of basic reasons, this alternative is not considered feasible. As stated on page 4.A-12 in Section 4.A, Geotechnical Resources, of the Draft EIR, due to the topography of the site approximately 32 percent of the grading for the project, representing approximately 6.4 million cubic yards, is associated with the extension of Whites Canyon Road to Sierra Highway. If the extension of Whites Canyon were to be retained with residential development still concentrated in the southern portion of the site while also avoiding impacts on the unnamed drainage, more than 6 million cubic yards of soil would need to be exported from the site. This represents a substantial amount of export material estimated to cost from $60 to $120 million dollars when considering loading, hauling, unloading and possible landfill costs. It is estimated that it would take 100 truck trips a day for a period of 15 years to export this much soil. Associated impacts on air quality alone would be four times the significance threshold for NOx over this extended period, along with more than 3,800 tons of greenhouse gases per year. There would also be impacts on traffic, local roadways, and noise due to the number of truck trips per day.

RESPONSE NO. G4-6

The infeasibility of the suggested alternative does not relate to the ability to develop 950 to 1,000 units in the southern portion of the site, rather, as stated in Response G4-5 above, infeasibility relates to grading export costs and associated impacts on the environment.

RESPONSE NO. G4-7

Regarding the feasibility of suggested Alternative C, see Response to Comment G4-5 above. Regarding Alternative B, it should be noted that because it provides an alternate approach to site access, it does not face the massive grading requirements that render suggested Alternative C infeasible. Reduced Alternative B provides 935 lots and avoids impacts on the unnamed drainage.

RESPONSE NO. G4-8

The comment that Reduced Alternative B is not feasible because of traffic circulation, and that it must be replaced by suggested Alternative C as the environmentally feasible alternative, is incorrect. The approach to circulation for Alternative B is feasible, and as demonstrated above in Response to Comment G4-5, the circulation and development scheme suggested with Alternative C is infeasible and it would result in substantially increased significant impacts on air quality and other issues. It is acknowledged that Reduced Alternative B would not fulfill the mobility objective of providing for the major highway improvement involving the extension of Whites Canyon Road.

RESPONSE NO. G4-9

The comments regarding dedication to a public park agency are noted and will be forwarded for consideration to the decision-makers. Provisions for brush clearance would be consistent with Los Angeles County Fire Department requirements as addressed in Section 4.M, Fire Services and Hazards of the Draft EIR.

RESPONSE NO. G4-10

The comment regarding the desire for all open space areas to be included under one dedication and managing entity is noted.

RESPONSE NO. G4-11

The comments regarding filming are noted.

RESPONSE NO. G4-12

The Conservancy's willingness to manage the open space lands is noted. Regarding funding for maintenance of open space lands, as indicated in Mitigation Measures 4.C-1 on page 4.C-71 of the Draft EIR, "The applicant shall provide long-term funding to assure management of the property to protect its biological resources in perpetuity."

RESPONSE NO. G4-13

Regarding funding for management of open space see Response to Comment G4-12 above.

RESPONSE NO. G4-14

Regarding funding for management of open space see Response to Comment G4-12 above.

RESPONSE NO. G4-15

Regarding funding for management of open space see Response to Comment G4-12 above.

RESPONSE NO. G4-16

The Conservancy's ability and potential interest in management of the open space lands associated with the project is acknowledged and will be forwarded for consideration by the decision-makers.

2. COMMENTS AND RESPONSES
B. PUBLIC HEARING TESTIMONY AND RESPONSES

REGIONAL PLANNING COMMISSION HEARING
SKYLINE RANCH
SEPTEMBER 16, 2009

Alejandrina Baldwin: Good Morning, Mr. Chairman and members of the Commission. My name is Alejandrina Baldwin and I am a principal planner with the Land Division Section. Item Number 9 this morning is a subdivision to create 1,260 single family lots, 25 open space lots totaling l,882 acres of open space, 13 debris basin lots, 1 public park, 9 private parks, total of 41.6 million cubic yards of grading, and associated permits including a conditional use permit for hillside management, density control development, on-site project grading and temporary materials processing plant. An oak tree permit has been filed on this project for the removal of one oak tree. There is only one oak tree within the project site. The project also requires a highway realignment permit to access the project site as depicted. Access will come from the west side of the project through an extension of Whites Canyon Road, through the project site, south to Sierra Highway. The new road will be named Skyline Ranch Road. The Draft Environmental Impact Report has determined significant impacts that cannot be mitigated to less than significant. These impacts include visual quality and cumulative traffic, among others.

Next slide please.

The project proposes a total of 1,260 units. Based on slope density analysis the calculation for this project the midpoint density of 870 units. The maximum units permitted within this project is 1,302 units. The project to cluster the development onto the southern portion of the site and the northern portion of the project site will remain within open space lots. Density within the project will be transferred onto the southern portion of the project. The northern portion as mentioned, that will remain an open space lots will have building restrictions. This project is

adjacent to residential development through the western southern part of the project, there are single family residential. To the south and southeast of the project there is multi-family residential and single family residential.

Next slide please.

The project will be providing a 12-acre public park to be constructed by the applicant and then dedicated to the Department of Parks and Recreation for maintenance. A draft of the park exhibit will soon come up on the screen. The park will provide various recreational uses including a basketball court, a baseball court and meeting areas. A 2.4-mile trail is proposed along the northern portion of the project site and the southeastern portion of the project site. Along the trail there will be various lookout points. Pedestrian accessibility is provided in various areas of the project via paseos. In addition, an additional, optional pedestrian bridge is proposed near the elementary school lot to allow pedestrian access between the east and west side of Skyline Ranch Road. The 11-acre elementary school is located in the middle of the project site along Skyline Ranch Road. Staff has received an agreement between the applicant and Sulfur Springs School District regarding acceptance of the elementary school lot.

If the school chooses to, they may construct the optional bridge to connect pedestrian traffic from the east to the west side of Skyline Ranch Road onto the elementary school lot.

Next slide please.

The current Countywide General Plan Master Plan of Highways depicts the location of the major highway coming into the project site from the west through the project, through the proposed open space lots connecting to Vasquez Canyon Road. On the exhibit to my left you can see the

current alignment of Vasquez Canyon Road; it would come from Whites Canyon, which is over here to the left straight through the project. This is the current delineation of this highway within the General Plan Master Plan of Highways. This project proposes to realign the highway to take the road through the project site towards the south of the project connecting to Sierra Highway on the southern portion of the project. The highway realignment will prevent a road through the proposed open space lot, which is also within, which is also proposed to be future significant ecological area within the General Plan update and the One Valley One Vision plan. This area is supposed to be the future SEA as it does hold the last vernal pools within Los Angeles County.

Next slide please.

This hearing has been labeled an insist hearing because this project is not complete. Staff cannot recommend approval of this project at this time as submitted. The tentative and exhibit A maps have not cleared the subdivision committee, there are technical holds including a revision of the schematic public park and cross sections for public works requirements. The applicant has continued to work with County staff to resolve these issues and will soon be ready to submit a revision to the map to be circulated through subdivision committee.

The highway realignment permit is not complete. To complete the permit, staff is requesting an additional conditional use permit to be submitted for the off-site grading associated with the construction of the highway. In addition an interdepartmental committee meeting must be held before approval of your commission.

For the realignment of the highway to be adopted, a General Plan amendment must be submitted and approved as the highway that is being realigned is within the Master Plan of Highways within both the General Plan and OVOV. I'm sorry, that does not matter. I'm sorry. If either

the General Plan update or OVOV, which does show the new realignment is approved and adopted prior to this project moving forward, the Plan amendment will not be required. At this time staff does not know if the applicant wishes to continue with the project with a Plan amendment.

Lastly, within the northern part of the project site, filming activity has historically existed, continues and is proposed to be allowed and remain.

Next slide please.

Other filming activity by various filming companies is conducted in a continuous basis. The filming activity takes place within the area proposed to be designated as the Cruzan Mesa Significant Ecological Area, within approximately 100 to 200 feet of the vernal pools. On the exhibit to my right, on the top right, I have identified the filming activity, which is the graded pad. This area also referred to as the Mystery Mesa Ranch or just Mystery Mesa. About 100 to 200 feet there are vernal pools. The pools are fenced, but the Draft Environmental Impact Report has not discussed any impacts that may happen to the pools due to the filming activity that is continuously happening on this project site. The applicant proposes to create this entire area to an open space lot and allow the filming activity to continue within it. Staff does not support continuous filming activity within a proposed open space lot that is proposed to be maintained as natural open space. In addition, the draft EIR has not discussed the possible impacts. Staff is continuing to also research whether a conditional use permit is required to allow the filming activity to continue on a continuous basis.

Next slide please.

At this time staff recommends that this item be continued to a date certain to allow for the applicant to continue working with County staff to clear all map holds, to complete the highway realignment permit including the submission of a conditional use permit and a Plan amendment, and to resolve the filming activity use. This concludes staff's presentation and now I am available for questions.

Commissioner Bellamy: Any questions to staff?

Commissioner Modugno: Miss Baldwin, it seems as if there is an awful lot of work that still needs to be done on this. How much time are you suggesting that you would be needed to complete it, to bring it back to us as a complete case?

Alejandrina Baldwin: At this point staff is waiting for responses from the applicant to see if they would like to continue with this project and the Plan amendment. After staff's analysis we see that we cannot recommend approval of this project without a Plan amendment. I do not know if the applicant wishes go that route. In addition to that, they also need to file an additional CUP and a new map. I believe they are ready to file a new map. I don't know about the other permits so it would be dependent upon how quickly the applicant could come back with the required corrections. A November date has been, I'm sorry a December date has been briefly discussed, which may be possible.

Commissioner Modugno: Alternatively, if we can't come to some conclusion in terms of some time estimates just taking it off calendar in terms of a continuance might make more sense?

Alejandrina Baldwin: We could do that as well. There is one item that wasn't brought up, which is if there is a General Plan amendment filed to allow this project to continue, the Draft

Environmental Impact Report may have to be updated. We are looking into this. If it has to be updated, if we would have to reopen it for circulation, which would add additional time.

Commissioner Modugno: Okay, now we have a meeting in the community on October 5th or, I think it is on the 5th, to begin to discuss the Castaic plan. Is there any One Valley One Vision discussion that is going to take place on that meeting?

Sorin Alexanian: I'm sorry I couldn't hear the question

Commissioner Modugno: A public meeting is taking place in Santa Clarita Valley the evening of I believe Monday October the 5th.

Sorin Alexanian: That is correct.

Commissioner Modugno: And that's looking at the Castaic Community Standards District. Is there also some discussion that evening on One Valley One Vision or in terms of how that interfaces within the One Valley One Vision or no?

Sorin Alexanian: According to the agenda there are two items on October 5th, one is One Valley One Vision and the other is the update, the Santa Clarita Valley Area Plan update. They are both related actually.

Commisioner Modugno: In that One Valley One Vision discussion that might have applicability in terms of the road designed through this project? Or is it focusing more on the West Valley.

Sorin Alexanian: I believe that the October 5th is intended for the One Valley One Vision project. But we can certainly look into it and report it to you a little later today.

Commissioner Modugno: The other thing, Ms. Baldwin, this is a case that you are deeply involved in. In the event of your absence, because it looks as though you are going to be taking a leave soon.

Alejandrina Baldwin. Yes, we have prepared for this.

Commissioner Modugno: Okay, there is someone on staff?

Alejandrina Baldwin. They will take over.

Commissioner Bellamy: Okay, thanks. It sounds to me like this is going to be a completely different project when you bring it back.

Alejandrina Baldwin: Excuse me.

Commissioner Bellamy: I said it sounds to me like this is going to be a completely different project when you bring it back.

Alejandrina Baldwin. Um, we don't expect a lot of changes. Mostly there are permits that have to be filed to correctly process this project. I haven't heard of any changes in design. Staff is not recommending changes in design or density at this time.

Sorin Alexanian: Mr. Chair, I am told that on October 5th that you are meeting out in Castiac. Part of the proposal is part of the OVOV is to consider the realignment of the highway I believe as proposed by the applicant.

Commissioner Modugno: Again, if we are putting that hearing first and it is the indication that we are moving in that direction with the One Valley One Vision, then that would not require this applicant to file for a General Plan amendment, perhaps. This just depends on the timing of what

is to be done first and so I think the dilemma they are going to be faced with is do we coat tail on back of the One Valley One Vision, which will require some re-pacing of this project, which may then get it into a requirement of having to go out and do the environmental documentation again going over some time period at that.

Sorin Alexanian: One of the dilemmas I believe would be the timing, the OVOV plan would have to go before the Board of Supervisors and that we are not certain how long that process will take and I believe our position is that the highway realignment should be adopted prior to approval of this project.

Commissioner Modugno: Unless applicant chooses to go for General Plan amendment.

Sorin Alexanian: Correct.

Commissioner Modugno: I don't, look it is slightly afternoon. I think we are going to have to adjourn at 1:00 today. This gives about an hour or so and I know you have a number of people who wanted to speak. My choice would be to try and get whatever testimony wants to be made but not dig deeply into the project until a subsequent hearing because Commissioner Valadez is not present with is today and to try and just get testimony on record for those people that don't want to have to make the trip again down here but want to get their comments on file.

Sorin Alexanian: From this chair I should state that there are total of sixteen speaker cards, eight of those speaker cards have indicated that they are part of the applicant's team and then there are two speakers in favor for no position and two have concerns.

Commissioner Helsley: Mr. Chair, I would like to request that we be certain to hear the eight that are not part of the applicant's team and particularly those who have concerns. I would like

to hear them first. I would be of hopes that the applicant to take and pass on their fifteen minute presentation because I think we are going to hear that in more detail at a later time.

Commissioner Modugno: Mr. Chair, could we have, Mr. Moore represents the applicant. If he could just step forward. Please put your name on record.

Charles Moore. Good afternoon, I'm Charles Moore, my business address is 2049 Century Park East, Los Angeles, and I am appearing on behalf of the applicant.

Commissioner Modguno: Mr. Moore, the question is, I think you've understood from our dialogue, we've got a fifty minutes that we are going to be here this morning or this afternoon. One of our commissioners is not present. This is a very important case because of its size and scope. It is also important because we are in a drought period and the state legislature didn't take action recently and they sort of adjourned without addressing the state's water problems.

Charles Moore: We noticed.

Commissioner Modugno: They were too busy with other things, obviously, but that to me is a massive, massive issue that we've got to be able to address. We've got a commissioner not present. There are technical issues that staff has pointed out. I want you to have your full day in terms of being able to present this case to us but I think it would be helpful to us if that could either be limited or wait until we have a continuation of this and at least get on record people's testimony, particular those testimony of people who have concerns about the project that you might then be able to incorporate within your presentation. Again it is up to you.

Charles Moore. Thank you very much. I appreciate the circumstances. I would be remiss that if I didn't point out that we disagree with the necessity for a Plan amendment and new CUP, but

that can all be discussed at a later time. May I suggest there are at least two officials here to speak, one from Sulfur Springs School District and another representative of an association. If we could have the officials speak and then yield to the interested persons and then we can discuss the continuance, I think that works for everyone. Is that what you suggest?

Commissioner Helsley: I would like to go in that direction with one other caveat and that is I don't think that the bridge to the school should be an alternative. I think it is a necessity. **Commissioner Bellamy:** The two officials.

Sorin Alexanian: Did you want to hear from the officials? Alan Ferdman, Vicky Myers. We have David Koontz.

Commissioner Bellamy: After them, the two persons that have concerns. Okay.

Sorin Alexanian: And Ian Perry, also with the City of Santa Clarita and the two individuals that have indicated concerns, Lynn Plambeck and Paul Edelman, are they here? They're here.

Alan Ferdman. Good Morning, Commissioners. My name is Alan Ferdman. I am chair of the Canyon Country Advisory Committee and a forty-four year resident of Canyon Country. The Canyon Country Advisory Committee is comprised of concerned citizens who wish to make Canyon Country a better place to work, live and play. Our goal is work collaboratively with residents, city and County governments, businesses, schools and other community stakeholders to make Canyon Country better then ever. Whenever new development is proposed there are always those individuals who object to growth of any kind and those who sit back and just throw around all those tired terms. How can any developer expect to overcome all that sentiment. In this case, the representatives of Pardee Homes took a practical and realistic approach. To assure

H1-1

the community's questions and concerns were answered and mitigated, they approached the Canyon Country Advisory Committee and provided information about how they felt this development would blend with our community. Pardee Homes has presented its Skyline Ranch project to our group several times and they openly shared updates accomplished as a result of previous meetings and answered new questions. Additionally, they took the time to provide me with a tour of the proposed site and allowing me to view it first-hand. Our group was pleased to see that there would not be any interconnecting residential streets from the Skyline Ranch development to the adjacent neighborhoods, thereby guaranteeing that cut-through traffic would be an issue. We were also pleased that the main roadway providing access to Skyline Ranch would also provide an interconnection between Plum/Whites Canyon and Sierra Highway. We like the Skyline Ranch design with the trails, bike paths, a new park, a new elementary school and the permanently designated open space provided north of the project. Lastly we were impressed with the idea that the east side access would provide the improvement to Sierra Highway, an area sorely needed of attention. We therefore wish show our support for the Skyline Ranch Project, we want to make a special comment about how Pardee Homes made every effort to alleviate concerns our community raised ending with a project that blends with and enhances our community. Thank you very much. **H1-1** Cont'd

Commissioner Bellamy: Thank you. Any questions? Yes maam?

Vicky Myers: My name is Vicky Myers. I'm the assistant superintendent of business for the Sulfur Springs Union School District in Santa Clarita and it is a pleasure to be here to speak on behalf of Pardee Homes. Our district has completed four mitigation agreements with Pardee, which have already resulted in the completion of two elementary schools, the first being Fair Oaks Ranch and the second Golden Oak. I've worked on two of the mitigation agreements and **H1-2**

Pardee works very, very well with our district, taking into account the type of sites that we need, the location, accessibility and the educational needs of our students. When I came on aboard, the Golden Oak site had just been graded and although there were no houses under construction in the tract, Pardee recognized our concern for housing more students and space the needed and went ahead with the construction and it has been completed and opened for a full year and we still do not have any houses in the area, but we have built that school. They worked closely and cooperatively with our district from the beginning of the project to the end and the result was a state-of-the-art facility complete with fully outfitted science lab, lap-top computers at every station, document cameras, smart board televisions, dishwasher, refrigerator, lab tables and stools. It has been a sense of pride for all of the schools in our valley. They've met there and now all the other schools are modeling theirs after what Pardee has built for us. Each of the schools have interactive smart boards and document cameras in every classroom for use in instruction through Kindergarten through 6th Grade. We have a fully operational computer lab 32 students utilize every day. And every school has beautiful landscaping including the running track, they are utilized by the neighborhood community, children on the weekends and after school, we have soccer games there and Little League practices and our school grounds are opened, like I said they are used as parks. We leave them open for the community. Skyline Ranch and Sulfur Springs and Pardee have an agreement in place to designate ten net usable acres for our next elementary school site and for the construction that will house 500 students with the utilities in place to expand to 750 and Pardee has labs, buildings, furnishings and equipment under this Agreement. They have worked closely with our District in the past and our students and staff and the entire Canyon Country community have benefitted greatly from our continued partnership. Thank you.

H1-2

H1-3

Commissioner Bellamy: Thank you very much. Any questions? Thank you. Question?

Commissioner Helsley: I would like to ask – did you find that in your experience with your school district that this is typical of most developers in the area?

Vicky Meyer: No.

Commissioner Helsley: Thank you.

Vicky Meyer: They are exceptional.

Commissioner Bellamy: Thank you very much. Yes sir?

Ian Perry:. Good morning and thank you, Commissioners, for this opportunity. My name is Ian Perry, I am the Senior Traffic Engineer with the City of Santa Clarita. I am here this morning to speak to you regarding the off-site mitigation at the intersection of Sierra Highway and Soledad Canyon Road. Per the EIR, the applicant would be required to add a second southbound left-turn lane, which they have been able to demonstrate that can be accommodated within the existing right of way. However, what I wanted to point out is Sierra Highway on our General Plan and OVOV circulation plan is six-lane major arterial. North of Soledad it is currently four lanes. The City wanted to make sure that the addition of the second southbound left-turn lane doesn't preclude the City's ability to add that third through-lane in each direction north of Soledad. We've been working with the applicant and their engineer over the past year, reviewing various drawings and improvement plans and as of yesterday they have been unable to demonstrate that the left-turn lane doesn't use up so much right of way that the additional through-lanes can be added. I understand that they have had trouble finding right of way documents to establish where the right of way actually is located. However, I would like to add that as of this morning I

H1-4

did receive from their engineer a revised drawing. Now just initially it appears to accommodate what we've be asking. Obviously the City has not had time to review this drawing, by myself and our other engineers. We will continue to work with the applicant and their engineer to insure that those third lanes can be accommodated. H1-4 Cont'd

Commissioner Bellamy: Thank you. Any questions? Yes sir?

David Koontz: Members of the Planning Commission. My name is David Koontz. I am an Associate Planner with the City of Santa Clarita. I just wanted to start off by giving some thanks for the really extraordinary experience that I have had interacting with your Planning and Public Works staff over the past year on this project. We've worked closely with Susie and Alejandrina and Steve Burger and they're most professional and most cooperative and it has been truly a joy to feel that we worked as a team for the common good of the Santa Clarity Valley. I also wanted to acknowledge Pardee. They've responded to numerous concerns that we've expressed to them about various portions of this project. They have met with us, they have made certain changes to the project to try address our concerns and we appreciate that as well. With all of that said, I do want to indicate that during this continuance time there are still a number of technical issues that we believe can be resolved and that we want to resolve and that we think will benefit the project. H1-5

Just to go on record to outline what a couple of them are, with regard to Skyline Ranch Road, which is the major access secondary arterial that will run through the project. Currently, the street section proposed is for a class two bikeway. We have real concerns of the class two bikeway. We would like to see a class one bikeway and we believe that a class one bikeway can be easily accommodated within the right of way they are currently showing. There has been some discussion between the City and County Public Works on this. There are trade-offs in any street section between parkway, sidewalks, bikeway and we believe that there may be some H1-6

trade-offs that will need to be made here, perhaps a non-standard street section will need to be considered. But at the end of the day we think that if we keep working together that we will resolve this and achieve what will be a better bikeway for the residents and a workable street section that will fit with the applicant's current plan. Additional technical issues that we hope to address during this continuance period is currently would be the improvements for Skyline Ranch Road west of the project between the subdivision boundary and Plum Canyon. The current conditions as I read them and their just draft conditions call for only 24 feet of improvement; however, the Shappell project has already dedicated a full 80 foot right of way for their previous Ferrell Road alignment, which this Skyline Ranch Road will connect to. Skyline Ranch Road will be required to dedicate 80 feet as well. With those dedications in place we can't see a strong justification for not going ahead with the 80 foot improvement. It will be a B&T roadway, so the road will be funded anyway. And we just think that the public interest would be served in that regard. And I already spoke to you about off-site mitigation. There is an awful lot of coordination that goes on, on a project like this where the City abuts the project on two sides, where even the sewer from this project runs through the City, where the storm drains connect to the City, where the intersection and entryway on the south are in the City. There is an incredible amount of coordination that has to occur for things to go well and fortunately I am here to tell you that coordination is happening and it is happening very effectively.

H1-6 Cont'd

H1-7

H1-8

Commissioner Bellamy: Thank you. Any questions? Thank you very much. Yes, maam.

Lynn Plambeck. Hi, my name is Lynn Plambeck. I'm here representing Santa Clarita Organization for Planning and the Environment. We haven't submitted our comments yet, but we intend to do so, and request that since you're going to continue this hearing apparently that you leave the public comment period open, or re-open it, it closed on Monday technically. We

H1-9

do appreciate having an opportunity to review responses to comments, which wouldn't be available to us if we stood by the 14th date. We also believe this project was improperly noticed. Your own staff report states that it requires a General Plan amendment, but it was not noticed as such. And I think it's inappropriate for all of us to be having to call the department to find out that indeed it needs a General Plan amendment and that it would automatically go to the Supervisors or else it has to go through OVOV. That should have been in the notice. Now it needs a General Plan amendment to the Highway Plan, so that should have been in the notice. You're supposed to notify which entitlements need approval here and we didn't receive that. We are also concerned that there is no development monitoring system printout in the appendices of the EIR. Although it says that it is attached to the notice of preparation, it is in fact not in the DEIR. The development monitoring system is a requirement of the County of Los Angeles General Plan. It is supposed to review infrastructure needs based on what's already been approved, but not built, including projects that are ahead of this one so you get a good overview of the cumulative needs. It is particularly important in this case because there is no sewer to this project. We have huge sewage problems in Santa Clarita. We have a big water quality problem with chloride, we have traffic issues, we have water supply issues. There's several, there are a lot of projects that have already been approved that aren't yet built so we need to have a closer look. And the DMS printout on this project was 2004. It's inappropriate to get a project back five years later and not update the development monitoring system. That amendment was put into effect as a result of a public interest lawsuit and it seems that the planning department would like to forget it exists. That's because no one remembers it's there anymore. But we remember it's there. I would like to talk to you about air quality. As you know we have some of the worst air quality in the nation in Santa Clarita. We are in a non-attainment zone for particulate matter

H1-9 Cont'd

H1-10

H1-11

H1-12

H1-13

and for ozone. And yet we continue to approve these massive project out in distant areas, not close to any public transportation that will necessitate a car. These people are not going to ride their bikes to work even if they have a bike lane. This is contrary to the Governor's initiative on trying to do land use concentrating, SB 375. It is contrary to SCAG's effort to start approving how the more concentrated areas close to transportation nodes. And I just feel that we cannot do it without you, we can't do it when these projects, the old dinosaurs continue to come to you and they just continue to get approved. So as you look at this further I hope you will address these issues. H1-13

Commissioner Bellamy: Thank you. Any questions? Thank you. Lorraine Woodman and Jay Ziff. Mr. Edelman is first, yes.

Paul Edelman: Hello, Commissioners, I'm Paul Edelman representing both the Santa Monica Mountains Conservancy and the Mountains Recreation and Conservation Authority. At this stage neither Agency can support this project given the fact that the Alternative B, the reduced footprint alternative, is so superior and still provides a tremendous amount of units and more or less meets the project objectives. Generally, and this we expressed in 2004 notice of preparation letter, generally a project that fills a whole blue-line stream, i.e. Mint Canyon, and have that avoidable is something our agencies cannot support. H1-14 The MRCA manages about 60,000 acres of land from the triangle of the Oxnard Coast to Palmdale to Whittier to Ballona Creek and we urge that one way or another, that if County Parks and Recs defers to taking this open space that the property go to the MRCA, the Mountains Recreation Conservation Authority. There has to be some funding for maintaining the open space and I know a couple of times I have been up here and deferred the Board of Supervisors to that Rec and Parks that they were going to get in on the landscape maintenance district to fund the open space maintenance. They didn't do it so that the H1-15

track record of Rec and Parks seeking that opportunity is not so hot. So one way or another, please don't approve the project without really good permanent funding for the open space. The mitigation monitoring plan in the DEIR does include provision for permanent funding source, but there is zero specifics in there and we really urge Pardee to work with the staff to come up with something that is solid and will provide enough money. Because really the open space is the centerpiece of the mitigation for this project. It's a great piece of open space and 1,500 acres of land is a lot of land to manage and particularly when you are dealing with a vernal pool that has not had any TLC and quite the opposite of TLC for decades and is really the centerpiece of the centerpiece. The MRCA currently manages another vernal pool with the same endangered species in Ventura County and Tiera Rejada Valley. So we're really, whatever happens has to be a commensurate amount of money to a project that is going to push 20 million cubic yards and put them somewhere else for a total of 40 million cubic yards and millions and millions and millions of dollars of off-site improvements. Somehow we urge that the Commission make, set aside a certain amount of money. You ask well how much money and really the amount of money is what does the public deserve in terms of the visitor use and the land stewardship. It is up to the County and we think that, in our notice of preparation comments we said a minimum of $35,000 per year with inflation adjusted, what that gets you at current rates is about ten hours a week of ranger services and maintenance services and whether or not you think that is enough, whether there should be a port-a-potty there that service that people hiking at that facility that is something we can talk about in the future. And we will submit some written comments. As our notice of preparation letter said include a certain number of thousand dollars for immediate on-site improvements: signage, trails, kiosks, things of that nature. And I'll close with saying that the whole idea of this bouncing along longer with the filming in the vernal pool. And if the map

H1-15

H1-16

H1-17

is approved by not recorded forever and in a lifetime a lot of things happen, grading occurs and maps get recorded many, many, many years after you've taken action or the Board of Supervisors takes an action, that the vernal pools not be allowed to degrade any longer and that filming issue be addressed to a point where there is no degradation occuring. Lastly, and our other concerns in our comment letter in 2004 we said there really should be a large chunk of money to restore the vernal pools too because so much density is being transferred from that area and it is really the right thing to do being a key resource in the County. Other than that thank you for your time.

H1-17 Cont'd

H1-18

Commissioner Modugno: Let me ask you a question. There is a disturbed area for the filming at the present time. Southern California derives a great deal of revenue from filming. If the area is already disturbed and it is near a vernal pool would you have any interest of exploring some possibilities of a continuation of filming and that becomes a funding source to maintaining the open space areas, perhaps improving and doing some things. That whatever agency takes over ownership then also has the right to derive a revenue stream from the area that has already been disturbed. I see that there might be some compromise.

Paul Edelman: The MRCA has an extensive, we have extensive filming on our property and two people devoted, half their job to doing that, and we balance it out. We look at it as a case by case basis. However, in no location do we have a permanent filming ranch on open space dedication area in an SEA. It's more a film crew comes in, does the work, hires a staff biologist proves it and we move on – we don't object that. I think that the main thing being the public made a good deal and not have the filming be the only funding source for the open space when that funding from the filming could actually help maintain other pieces of open space that don't have enough funding that Pardee step up to the plate and provide the bulk of the open space

funding. So we are absolutely not opposed to filming, but if filming, the current filming has impacts on resident or migrant wildlife in certain seasons or the runoff goes into the pool and those are concerns. H1-19

Commissioner Modugno: I was almost reading from staff's earlier comments that they're heading towards eliminating the filming and requiring the applicant to do some restoration of the area – so suddenly that puts the area back in a more natural state, but eliminates potential revenue source. The trade-off here in terms perhaps the area is already disturbed, looking at that again at this point I've not seen it, I don't know what the circumstances or specifics are but there may be a valid position here that could improve the environment.

Paul Edelmen: It is really important to realize that just because something is disturbed, but in ten years left to its own devices it wouldn't qualified as disturbed anymore so it is really an oxymoron, so it is not appropriate to say that something is disturbed that it's permanently disturbed so that's important.

Commissioner Modugno: Okay thank you.

Sorin Alexanian: Thank you very much. That brings us to Mr. Moore. Charles Moore and his team.

Charles Moore: Charles Moore again. Just when you think you've seen every kind of public hearing we something new. We began by hearing that we needed a Plan amendment and the matter had to be put over and we needed a new conditional use permit now we have heard that we have one oak tree and the City is support of the project and staff has no design changes. I don't know whether the Commission, as long as the staff leaves recommendation on the power

point I need to comment. The first bullet point, staff is recommending a continuance because we need to clear subdivision committee holds. Each and every hold is a result of detail changes that have been made recently to accommodate the City. They simply have not had a chance to go to subdivision committee. The subdivision committee will see the changes, they're all changes supported by the City with whom obviously Pardee is negotiating and working closely. File a new conditional use permit. I guess the conditional use permit requested is for off-site grading. There is a conditional use permit now on file for grading on-site and off-site. I have never see an analysis of why we need to break that into two conditional use permits. File a general plan amendment. There is no requirement that every road be described on the general plan. Skyline Ranch may proceed without being depicting on the general plan. Now I would say that Skyline Ranch is depicted in One Valley One Vision. It is depicted in the pending Highway Plan update by the County. So I'm not that concerned about a Plan amendment. As for holding an IEC Meeting, this very meeting may constitute a meeting of the IEC. There is no need to postpone the hearing for that. Resolve filming activity. I heard the staff indicate that there is continuous filming. I've been to the site several times and I've never seen filming. It is a site of intense filming activity I agree but it is not continuous. And I would also say that it is within the conservation area that is to be dedicated to a public agency. Maybe the public agency ought to have something to say about conservation, filming, the funding. Edelman spoke about funding from the filming and certainly the land is proposed to dedicated. I will say that four years ago we had extensive discussions with the enforcement section of planning and resolved the issue of filming. So I don't know what it is reoccurring today. Having said all of that we support a continuance. We look forward to bringing this case to you. I don't' know if it is worth going forward with the beginning of our case. Mr. Bizzelle, Vice President with Pardee, is here and

ready to move forward with perhaps. I must also say we heard all testifiers in opposition. Again, we are supportive of a continuance and we want to continue clearing the technical holds, working further with the City, addressing Mr. Helsley's concern about the turn around and we are getting there. We are supportive of the continuance, we can go forward now only to break in 15 minutes. It is the Commission's choice.

Commissioner Modugno: I think, thank you Mr. Moore, I think the very few comments in opposition and I think we are quite focused and certainly the water issue is one of major concern to all of us. Again I think that I prefaced earlier the legislature sort of ignored the issue this session, which was a disappointment. We know how precious water is to us and yet we have repeatedly every time we turn on the television seen massive amounts being lost through pipe failures in the City of Los Angeles or the amount of the Fire Department has had to use in fighting with these huge fires that are taking place. That is water that is just lost. It is not going to come back to us. So that's an issue that is going to be a major point on this. Then we've got the One Valley One Vision that is going to be proceeding alongside. I think the technicalities that Ms. Plambeck brought up in terms of notification. You weren't suggesting a Plan amendment and therefore it wasn't advertised that way and the staff raised the issue, but I think for us to get down a clean case and have a staff recommendation with it puts us in a much better position to hear a case and see if the staff is prepared to move forward with it, have draft conditions, incorporating those, and having a full commission, I think makes much more sense and I think this is sort of to treat as a preview. **H1-20**

Charles Moore. And we support that point . . . request to continue.

Commissioner Helsley: Mr. Chairman.

Commissioner Bellamy: Yes.

Commissioner Helsley: I greatly appreciate your deferral. I think it makes our discussion via public support via public concern of even greater of importance. I think it was important that we had the opportunity to hear the officials and the concerns that were voice today. I think that the one that is still sticking out there beyond where you commented is and what I've read is the aspect of public transportation. I think that is a major concern and I voiced that to this Commission a number of times that as we looked twenty years ago down the road we may be on bicycles and walking. Electric cars are probably going to be our major form of transportation as we come to peak oil and we start down the slope on the other side. So it is a major concern but I think to protect the community we need to have a community that is going to be something that is a walkable community. I think you have the potential of doing that and we certainly have some very strong supporters to show that you've done diligent work within the community. The quote I think of the day is that you're going to be cutting down one oak tree, one hundred percent of your oak trees are going to be lost. (laughter) **H1-21**

Commissioner Modugno: Do we have the dates certain in mind for this?

Sorin Alexanian: Yes, a three month continuance would take us I believe to December 16th, which is the last meeting of the year for the Commission.

Commissioner Modugno: I see a head nod on behalf of the applicant. Mr. Moore, is that acceptable?

Moore. Yes, it is.

Commissioner Modugno: I will make a motion then that we continue this hearing to a date certain of December 16, 2009.

Commissioner Helsley: Second.

Commissioner Bellamy: It's been moved and seconded. Any further discussion? All in favor.

Commission: Aye.

Commissioner Modugno I want to thank all of you for your patience and holding back your desire to put on the record what I'm sure you have just budding to speak, but we'll hear that at our next hearing.

H. PUBLIC HEARING BEFORE THE REGIONAL PLANNING COMMISSION (SEPTEMBER 16, 2009)

RESPONSE NO. H1-1

Comment noted.

RESPONSE NO. H1-2

Comment noted.

RESPONSE NO. H1-3

A discussion of the proposed Mitigation Agreement with the Sulphur Springs Union School District is provided in Section 4.N, Education of the Draft EIR.

RESPONSE NO. H1-4

Please see Response to Comment G3-5. As noted in this response, mitigation for the intersection of Sierra Highway and Soledad Canyon Road has now been resolved between the City of Santa Clarita and the County Department of Public Works.

RESPONSE NO. H1-5

Comment noted. Please see Responses to Comments H1-6 through H1-8 regarding additional technical issues.

RESPONSE NO. H1-6

The applicant, County Department of Public Works and City of Santa Clarita are continuing to work together to resolve issues on the design of Skyline Ranch Road, including the designation of bikeways. However, standard conditions imposed by the County only require the provision of Class II bikeway. As shown on the October 2009 Tract Map, a Class II Bikeway is proposed along Skyline Ranch Road.

RESPONSE NO. H1-7

The applicant, County of Los Angeles and City of Santa Clarita continue to coordinate on the preferred design of Skyline Ranch Road. However, as shown on the October 2009 Tract Map and as stated in the December 3, 2009 staff report, the proposed County right-of-way for Skyline Ranch Road between the westerly project boundary and the Bension Extension is approximately 82 feet and from the Bension Extension to Plum Canyon/Whites Canyon Road is 80 feet. The conditions referenced by the commenter are "Draft" conditions and will be revised by County staff to reflect the street improvements shown on the current tract map and ultimately approved by the County Department of Public Works and Regional Planning. These revised cross sections of Skyline Ranch Road are presented in Chapter 3.0, Corrections and Additions to the Draft EIR, in this Final EIR.

RESPONSE NO. H1-8

The Draft EIR addressed project impacts on City and County sewer lines, storm drains, and intersections in Sections 4.J, Wastewater Disposal, 4.B, Hydrology and Water Quality, and 4.E, Traffic/Access.

RESPONSE NO. H1-9

Comments received on the Draft EIR during the formal comment period (i.e., September 14, 2009) and after the formal review period closed, that is up to February 12, 2010 have been responded to in this document. The Final EIR is available for review on the County's website at: http://www.planning.lacounty.gov/case/all

RESPONSE NO. H1-10

This comment was made during the Regional Planning Commission hearing held on September 16, 2009, when the project did not include a request for a General Plan Amendment to amend the Los Angeles County Master Plan of Highways to realign Whites Canyon Road to the proposed Skyline Ranch Road alignment as a secondary highway from Plum Canyon to Sierra Highway. At the time the Draft EIR was prepared, it was anticipated that the highway realignment would be approved as part of the County's pending updated General Plan and updated Area Plan for the Santa Clarita Valley (or the One Valley One Vision [OVOV] plan). At the time the Draft EIR was prepared, approval of the updated County General Plan was anticipated to be December 2009 and therefore prior to the final public hearing before the Regional Planning Commission and Board of Supervisors for the Skyline Ranch Draft EIR. Because the approval process for the updated

County General Plan and OVOV has been delayed, County staff requested that the Skyline Ranch project initiate the General Plan Amendment request for the realignment of Skyline Ranch Road. Because a new entitlement was requested, for the December 16, 2009 continued public hearing at the Regional Planning Commission, the County provided new and revised notices of public hearing in compliance with County Code Sections 21.16.070 and 22.60.174, posted the project site in compliance with County Code Sections 21.16.075 and 22.60.175, and posted the revised notice on the County's website at: http://www.planning.lacounty.gov/case/all and published in The Signal on November 13, 2009 and La Opinion on November 14, 2009. The revised notice included the request for a General Plan Amendment to amend the Los Angeles County Master Plan of Highways to realign Whites Canyon Road to the proposed Skyline Ranch Road alignment as a secondary highway from Plum Canyon Road to Sierra Highway.

However, the proposed realignment of Skyline Ranch Road, as envisioned in the updated General Plan and OVOV, was described and analyzed throughout the Draft EIR. As stated on page 2-17 in Chapter 2.0, Project Description, of the Draft EIR, this realignment is shown on the County's Draft Highway Plan, a component of the Draft General Plan, and was conditionally approved as Skyline Ranch Road by the Los Angeles County Department of Public Works on July 19, 2006. See also Chapters 2.0, Project Description, pages 2-14 through 2-26; 4.A Geotechnical Resources, page 4.A-12 and Figure 4.A-4; and 4.C, Biological Resources, pages 4.C-64 and 4.C-65. The addition of this approval is noted in Chapter 3.0, Corrections and Additions to the Draft EIR, in this Final EIR.

RESPONSE NO. H1-11

The Development Monitoring System (DMS) print out is included in Appendix A of the Draft EIR following page 25 of the Initial Study prepared for the project. As stated on page 3 of the Initial Study, "as required by the Los Angeles County General Plan, DMS shall be employed in the Initial Study phase of the environmental review procedures . . ." A list of 48 related projects comprised of approved and pending projects in the County of Los Angeles and the City of Santa Clarita is provided in Chapter 3.0, Cumulative Impact Analysis Methodology, Table 3-1, in the Draft EIR. As also described on page 4.F-16 in Section 4.F, Traffic/Access of the Draft EIR, this list was last reviewed and updated on December 2007. This list of related projects used in the Draft EIR provides a more up to date and appropriate basis for the EIR evaluations than the DMS print out. It also supports a conservative analysis since not all the related projects will be approved and/or fully built out and some of the related projects will be constructed and occupied after the proposed project has been built and occupied. Regarding the provision of sewer service to the project site and related projects, this was analyzed in Section 4.J, Wastewater Disposal with supporting data provided in Appendix J, of the Draft EIR. As concluded in the analysis, project impacts to waste water disposal would be less than significant. Cumulative impacts on the City's sewer line capacity would be less than significant with the construction of a new 24-inch sewer line (proposed as part of

the project), and payment of fair share fees and/or construction of a relief sewer line as required by the City.

RESPONSE NO. H1-12

The Draft EIR addressed water quality in Section 4.B, Hydrology and Water Quality, traffic issues in Section 4.F, Traffic/Access, and water supply in Section 4.I, Water Resources with supporting data provided in Appendices C-3, F, and I, respectively. Project and cumulative impacts on water quality and traffic were less than significant with implementation of mitigation measures, with the exception of cumulative impacts to Highway 14 between Sand Canyon Road to the south of the Sierra Highway interchange which would be cumulatively significant. Project and cumulative impacts on water supply are less than significant; however, mitigation measures are proposed to ensure consistency with local and regional water conservation objectives.

See Response to Comment H1-11regarding the DMS and cumulative development analyzed in the Draft EIR.

RESPONSE NO. H1-13

The Draft EIR discussed air quality is Section 4.H, Air Quality with supporting data provided in Appendix H of the Draft EIR. As described in Response to Comment E1-12, the South Coast Air Basin, of which the Santa Clarita Valley is a part, is in a non-attainment zone for particulate matter. However, there is a trend towards the reduction of particulate matter concentrations over time. As shown on Table 4.H-2, Section 4.H, Air Quality of the Draft EIR, the Basin is also in non-attainment for ozone. As depicted on Table 4.H-3 of the Draft EIR, the number of days that national and California air quality standards are exceeded for ozone concentration has been reduced over time. As stated on page 4.H-40 of the Draft EIR, the project's operational emissions and the project's contribution to region-wide emissions would result in a significant and unavoidable air quality impact. Regarding the commenter's assertion that the proposed project is contrary to SB 375 and SCAG's efforts to concentrate development near transportation nodes, please refer to responses to SCAG's comments, in particular Responses to Comments D1-5, D1-6 and D1-7. As stated in these responses, the project includes a system of landscaped pathways, paseos, a pedestrian bridge, and bike lanes that encourage and support walking and bicycling to the school and parks located on the project site, and to offsite areas as well (as described in Chapter 2.0, Project Description of the Draft EIR). The proposed project would also facilitate the extension of Santa Clarita Transit bus service to the project site. In addition, the proposed project would provide housing that would occur adjacent to existing housing and a proposed mixed-use development to the west. Consistent with the intent of SB 375, the project incorporates relevant objectives, features,

and mitigation measures to reduce greenhouse gas emissions, as described in Section 4.S, Global Climate Change, pages 4.S-23 through 4.S-29.

RESPONSE NO. H1-14

As described in Section 5.E, Reduced Project B: 935-Residential Lot Alternative, pages 5-55 and 5-56, although this alternative would have less impact on biological resources it would not meet key objectives of the proposed project, including the extension of the Mint Canyon trail and the extension of Whites Canyon Road to Sierra Highway, as shown on the County's Draft Highway Plan. Alternative B was developed to avoid impacts on the drainage channel and was based, in part, on comments on the Notice of Preparation provided by the Santa Monica Mountains Conservancy. Since the September 16, 2009 public hearing additional comments were submitted by the Santa Monica Mountains Conservancy (see Letter G4) that proposed a new Alternative C. Please refer to Responses to Comments G4-5 through G4-8, for a discussion of this alternative.

RESPONSE NO. H1-15

The Conservancy's willingness to manage the open space lands is noted. Regarding funding for maintenance of open space lands, as indicated in Mitigation Measures 4.C-1 on page 4.C-71 of the Draft EIR, "The applicant shall provide long-term funding to assure management of the property to protect its biological resources in perpetuity."

RESPONSE NO. H1-16

Regarding funding for management of open space see Response to Comment H1-15 above.

RESPONSE NO. H1-17

The comment regarding filming activities in proximity to the vernal pools is noted. Please see Response to Comment A2-18 regarding filming within the Skyline Ranch Conservation Area and preservation of the vernal pools. Filming activities within the Non-Development Continuing Use area may continue, as described in Chapter 2.0, Project Description, of the Draft EIR.

RESPONSE NO. H1-18

Regarding funding for management of open space see Response to Comment H1-15 above.

RESPONSE NO. H1-19

Please see Response to Comments H-17 and A2-18 regarding filming activities.

RESPONSE NO. H1-20

The Draft EIR addressed water supply in Section 4.I, Water Resources with supporting data and analysis presented in Appendix I of the Draft EIR. As stated on page 4.I-40, in Section 4.I, Water Resources, of the Draft EIR, based on the analysis provided in the 2005 Urban Water Management Plan (UWMP) sufficient water supplies would be available to meet projected demand from future development, including the proposed project. As discussed on pages 4.I-41 and 4.I-42 of the Draft EIR, although there is uncertainty regarding the availability of State Water Project (SWP) water, based on the Department of Water Resource's 2007 SWP Delivery Reliability Report, sufficient water supplies would be available to serve the proposed project through 2030. Nevertheless, due to the reduction in SWP supply and Los Angeles County water conservation requirements, Mitigation Measures 4.I-1 through 4.I-5 are proposed to further reduce less-than-significant impacts to water supply. These measures include the use of water efficient fixtures, low flush toilets, water efficient irrigation, and drought-tolerant landscaping.

RESPONSE NO. H1-21

Comment acknowledged. The proposed project would facilitate the extension of Santa Clarita Transit bus service to the project site. As described in Chapter 2.0, Project Description of the Draft EIR, the proposed project would include features of a walkable community such as landscaped pathways, paseos, hiking trails, and a pedestrian bridge that encourage walking and to the school and parks located on the project site, and to offsite areas as well.

I1 Public Hearing Transcript

REGIONAL PLANNING COMMISSION HEARING
SKYLINE RANCH
DECEMBER 16, 2009

Chairman Bellamy: Thank you very much. Okay, we'll move on to public hearings. Item number six.

Susan Tae: Good morning Mr. Chairman, members of the Commission. My name is Susan Tae and I'm with the land division section of the Department of Regional Planning. As you may recall, Skyline Ranch is a subdivision to create 1,260 single family residential lots, thirteen debris basin lots, twenty five open space lots totaling 1,770 acres of open space. The twelve acre public park lot, nine private parks, and an elementary school within unincorporated Santa Clarita Valley. Associated permits include a conditional of use permit for Hillside Management, density control development, onsite grading and an onsite temporary materials processing facility for use during grading and construction of the project. An Oak Tree Permit was filed for the removal of one tree. There's only one oak tree within the project boundaries. The project also requires a highway realignment for the project's main access. Access will be provided by Skyline Ranch Road, an extension of White's Canyon Road/Plum Canyon Road through the project site in order to extend down south to Sierra Highway. This project was first before you on September 16, 2009. During a public hearing, six persons testified regarding the project, including the City of Santa Clarita, SCOPE, Santa Monica Mountains Conservancy, and the Sulfur Springs School District. After hearing from interested persons as well as the applicant, your Commission continued the public hearing to December 16th. The draft Environmental Impact Report has determined significant impacts that cannot be mitigated to less than significance, including impacts to visual quality, cumulative traffic, noise, and air quality, among others. Additional entitlements have also been filed since the September public hearing, including a general plan amendment and an additional CUP for off-site work. As mentioned, the project proposes a total of 1,260 single family lots. Based on the project's slope density analysis, the mid-point density is 870 and the maximum permitted is 1,302 units.

[Eric, if we could have the next slide please . . .]

The project proposes to cluster the development within the southern portion of the project site, with the remaining portion of the project site as open space. Density within the project was transferred onto the southern portion of the project, as you can see from the exhibit shown on the right screen. The remaining 1,700 acres, including the northern part known as Mystery Mesa, will remain as permanent open space with development restrictions. Open space lot number 1293, which includes 1,490 acres, will be dedicated to County Parks and Recreation. Open space will include natural areas, re-landscaped slopes, parks and trails. The project's main access is Skyline Ranch Road, a proposed secondary highway . . .

[If we could have next slides . . . Eric, on the left side I think we need to go back two slides. One more slide back, sorry about that. One more forward. No, um . . . slide five? On the left. Yeah. Thank you.]

The project's main access is Skyline Ranch Road, a proposed secondary highway, as you can see on the exhibit on the right hand screen that is the red line through the project site. The project does provide a loop circulation system from Skyline Ranch Road to serve the northeast and southwest portions as North and South Main Streets. Those are shown in blue, providing access to both sides of Skyline Ranch Road. Local residential streets connect to Main Street to provide direct driveway access to the homes. Roundabouts or traffic circles, which are shown in the black circle, are also proposed as intersections of North and South Main Street and Skyline Ranch Road. The project is adjacent to existing residential, there is single family residential directly to the southwest of the project site, and multi-family to the southeast and south. The City of Santa Clarita is immediately to the south and southwest as well.

Next slide . . . The applicant will be providing a twelve acre turnkey public park shown on the left screen. It's the largest green bush that's shown approximately where "Sheet Two" is labeled. This turnkey public park once constructed will be transferred to County Parks and Recreation. The park exhibit also depicts on the right screen, the park exhibit depicts the park with various recreation uses, including a baseball field and basketball court. On the left screen

are also shown private parks that total approximately nine acres and those are distributed throughout the developed area. Private parks will be maintained by the homeowners' association.

Next slides please . . . Next feature of the project is the public and private trail system. A system of public and private trails is proposed. The Mint Canyon Trail is a public trail within the large open space lot and is shown with the future staging area. Future construction would be coordinated through Parks and Recreation. The private trails are comprised mainly of existing trails that connect both to the public trail and to the paseos and street sidewalks within the developed area. These will be maintained by the homeowners' association. The pedestrian accessibility, this accessibility is also provided within the developed area of the project through paseos. Paseos are designed to connect to more remote cul-de-sacs and provide connection to the parks and sidewalks. A pedestrian bridge across Skyline Ranch Road near the elementary school is also part of the project and is no longer an optional element of the project. Stairs will provide more direct access from the bridge to the northeast part of the project site. All accessible access is still maintained through along the paseos/sidewalk connection. Additional project entitlements, general plan amendment has been filed. There are currently two highways mapped on a general plan's master plan of highways within the project site. As you can see on the exhibit on the right screen, the first is Whites Canyon Road. This is a road that travels northward; it starts at the west, excuse me, it starts at the east and then heads north through the large open space lot to Vasquez Canyon Road. Oh, excuse me, that is west. And that's a major highway. The second is Cruzan Mesa Road, which basically bisects the property, that is proposed as a limited secondary highway and is mapped going east to west. The project proposes to delete Cruzan Mesa Road and re-designate Whites Canyon as a secondary highway to be renamed as Skyline Ranch Road. The associated highway realignment also considers the change in location of this highway from its current mapped location to serve as the primary access. The general plan amendment has been filed to effect these proposed changes. These amendments are consistent with those proposed under the pending general plan update, as well

One Valley One Vision. However, since the project needs its own amendment . . . However, the project needs its own amendment because should it move forward, it would need standalone entitlements independent from the general plan update and One Valley One Vision. The additional entitlement also filed is the CUP for offsite grading. An additional CUP had been filed to address this grading construction that's necessary for Skyline Ranch Road west to Plum Canyon/Whites Canyon Road. The offsite grading consists of 535,000 cubic yards of cut and 37 cubic yards of fill. Before this morning's hearing continued hearing notices, including these new entitlements, were distributed and notice was also published in The Signal and La Opinion.

Next slide. Holds that were discussed at the last public hearing have since been resolved. One of the holds was regarding filming activity. The subject property contains an area that's popular for filming, and this area's proposed within open space lot 1293. After further consultation, staff has determined that the filming activity and the model that they're proposing does not require a CUP or to be included as part of the project. The onsite filming activities are already regulated through existing provisions, and in the future if the filming does change then the CUP would be required at that time. On the right screen the filming activity is shown on the north, uh, northeast corner of the project site. It's shown as a disturbed area adjacent to the vernal pools. And also resolved what was raised at the September 16 hearing was questions regarding the proposed mitigation area. 21.6 acres were required by the Army Corps of Engineers for the adjacent project, which is tract map number 46018. This mitigation area will be set aside within this project's open space lot 1293. After further consultation with both applicants however, we had resolved any concerns with the mitigation area as proposed since this will remain natural, and is consistent with the intended use of the open space area to remain natural. There are pending project issues at today's hearing. There are technical holds relating to the tentative and Exhibit A map. These maps were distributed to the Subdivision Committee after the September public hearing and, as of today, two technical holds still remain. These include proof of offsite easements for the grading and access, as well as approval of a proposed booster pump station. An interdepartmental engineering committee, or IEC, meeting is also still

required for formal recommendation on the highway realignment. The applicant has provided the necessary materials and staff anticipates scheduling the meeting with Planning and Public Works early next year. IEC recommendation will be forwarded to your Commission before final action. And additional information was received this morning and distributed this morning for the Oak Tree Permit. We received formal recommendations from the Forester regarding the request. The project proposes one removal and the arborist report has identified proposed mitigation as if it were a heritage tree, although the Forester indicated that technically today it's not anticipated that it is of heritage size. The Forester has concurred with their recommended conditions for ten mitigation trees and with the change to fifteen gallon trees to be planted. The project proposes modified street cross-sections for three main roads: Skyline Ranch Road and the North and South Main loop roads. These modified street designs were reviewed by County Public Works and recommended for approval. The City of Santa Clarita however, has alternate streets that Public Works at this point is not recommending for approval. There are also interim cross-sections for some of these roads. The interim designs are intended to be constructed first, and only if traffic warrants it additional improvements will be required to be constructing the streets to full capacity. All landscaping within the streets are proposed to be maintained by the Landscape Maintenance District. The alternate cross-section is also proposed where the sidewalk is adjacent to the car travel lanes and the parkway or landscaped area is adjacent to the front yards of the properties. With the alternate cross-section, the six feet of landscaping can be counted towards the lot area and used for setbacks. However, more recently staff has been evaluating requests for alternate cross-sections as it differs from the traditional neighborhood street design and potentially detracts from walkability by forcing pedestrians to navigate street furniture, utility boxes and other encroachments within the right of way. The sidewalks must also narrow and shift when the alternate cross-section comes in contact with the driveway entrance for the individual single family homes. And this is to meet ADA requirements. Staff has been consulting with Public Works on a recommendation regarding the alternate cross-section, and for this project staff does not have an objection with the alternate cross-section

proposal. Staff is, however, recommending additional setbacks for the garage portions of the homes. This would ensure that any car parked within the driveway portion of the lot would not obstruct the sidewalk. Staff is recommending a minimum of eighteen feet of clearance to allow for this . . .

The project proposes phasing of development with multiple final maps. Phase One, or the unit 01 map, will record approximately 1,325 acres of open space within lot 1293. Access will also record before the first recordation of the single family homes insuring access. The second unit map will include the public park, and the eighth unit map will include the school site. Flag lots are also proposed, four among the 1,260 lots that are proposed. Although few flag lots exist in nearby residential areas, flag lots can be compatible with new developments and proposed as part of a new community. These four flag lots are proposed off of cul-de-sacs and could be found consistent if all the homes are developed together and any concerns regarding new flag lot homes affecting existing residential would not be the case. The project proposes six areas of future entry monumentation. Four are within the County, and one is located offsite . . . oh, excuse me, one is located within the project and three within the adjacent project. Two are proposed within the City of Santa Clarita and all will be required to comply with applicable regulations at the time of sign installation. The subdivision project is also exempt from the Low Impact Development ordinance and would continue to be exempt. Green building and drought tolerant landscaping ordinances are enforced at the building permit stage and all of these ordinances will apply if future construction however, goes beyond the vesting time limits of the Map Act. In conclusion, staff, if the Commission agrees with the staff, the staff recommends that the Commission continue this matter to a date certain to allow the applicant to clear the remaining holds, for IEC to hold its meeting, and for the Final EIR with the associated documents and draft findings and conditions to be prepared. Staff is now available to answer any questions.

Chairman Bellamy: Any questions of staff?

Commissioner Modugno: Mr. Chairman, thank you Ms. Tae for the presentation. One of the points which was raised at the last hearing I think, echoed by the Commission, was water. And I know that the applicant has provided some information on updates in terms of where the State's heading with water, but ability to serve here is going to be very critical in terms of moving this project forward. Do you have any comment on water or where that stands at the present time?

Susan Tae: The water analysis in the draft environmental document was relied on a previous letter that had been issued by the Castaic Lake Water Agency and our impact analysis section has evaluated this letter in terms of this project and feels comfortable that the water availability provided in the Castaic Lake Water Agency still applies. There is additional discussion that the applicant is intending include in the Final Environmental Impact Report, however staff at this time feels comfortable that the water availability analysis is sufficient.

Chairman Bellamy: Any further questions of staff?

Commissioner Helsley: Yes, please, Mr. Chairman. With what's happening in the State Water Project, I think that we need to re-evaluate with current information the water situation. We don't really have a solution in the Delta yet. We do have tremendous amounts of water that are being held back for fish and Delta environmental concerns. I have a couple of other questions. The first, the easy one. And that is the Oak Tree report from the Forester goes so far that as we put conditions on this, I want to be certain that there is an added condition that as the oak trees are planted that there is an infusion of microrhizomes within the soil, and that there is an acorn planted with each tree that is planted not just a 15 gallon tree. Because the acorn will out produce that tree and it will be healthier root zone. But there needs to be added the microrhizomes. And the pump stations, these are in the sanitation series, in the sanitation lines? I1-1

Steve Burger (Public Works): The pump stations I believe are for the water system, and actually from what I understand I think that issue has been worked out. When we come back for final conditions we will clarify, but I believe, from what I understand and the applicant may be able to clarify, from what I read this morning the pump stations are already moved from the project.

Commissioner Helsley: There is fire flow at the higher elevation?

Steve Burger: Yes.

Commissioner Helsley: Are they providing any . . . We had in Yorba Linda in the last fire that went through a dry zone. One of the concerns I have is that if we have pump stations that are going to be pumping out good fire flow pressures, there needs to be a tank at the far end of that, which I didn't see on the plans and maybe I missed something. I1-2

Steve Burger: Yeah, I can double-check that there's a couple of different ways that the water companies handle it. One is to have redundant pumping systems that would, with including backup power sources, that could handle that scenario. The other one, which is the more set failsafe like you said is the tanks. I'll take a look at that and Public Works will take a look at that and review it and make sure that there is appropriate methods to handle fire flow.

Commissioner Helsley: The backup I think is the other one in that there needs to be two forms of power to that pump station as it goes forward. I can concur with the driveway setbacks, I think that's a very good move. I have concerns still in relation to Cruzan Mesa Road being removed because I think in the future as we look at this area that's going to be developing, this is not the last of the developments out there and so, I think that road should be maintained. I would like to have Public Works relate to that and come back with, okay why if we're going to delete it, why and how do we carry traffic for those other developments that are going to up and beyond this development. Because I think that if we shortchange the community otherwise. Thank you. I1-3

Chairman Bellamy: Any further questions of staff? Thank you. Do we have speaker cards?

Sorin Alexian: Yes. Mr. Chairman, we had a total of 11 speaker cards. Seven speakers represent the applicant and his consultants. I'd like to call on Jim Bizzelle. Also Robert Thomson. Jay Ziff is the EIR consultant available for questions. Mark Sikand and Craig Yang are the engineers. Charles Moore and Daryl Zerfass. Mr. Bizzelle? Is Mr. Bizzelle here? Please come forward.

Chairman Bellamy: Okay any persons that want to speak on this agenda item or any agenda item today would you please stand and be sworn in. Raise your right hand. Do you and each of

you swear or affirm under penalty of perjury that the testimony you may give and the matters now pending before this Commission shall be the truth, the whole truth and nothing but the truth?

All: I do.

Chairman Bellamy: Thank you. And the applicant will have 15 minutes. Please give your name.

Jim Bizzelle: Jim Bizzelle. And we're getting warmed up with the Powerpoint presentation. Good morning. As I said my name is Jim Bizzelle, Vice President of Community Development for Pardee Homes. Before I begin, I would like to take this opportunity to truly thank staff for all of their support bringing this project forward. Behind me today is our Skyline Ranch team to answer any questions you might have. I've broken our brief presentation into three sections: overview of Pardee Homes, our involvement in the Santa Clarita community, a few more details about our Skyline Ranch project. And with that . . . thank you. Pardee Homes began over 80 years ago and has been developing master planned communities since the early 30s. We are very proud of the communities we have developed. We entered the Santa Clarita Valley in the early 70s and still have a major presence there. Our Phillips Ranch project is one of our recent master planned communities in the Santa Clarita Valley and it's the first master planned community in Canyon Country. Pardee Homes develops communities from beginning to end. In several cases we bring out amenities earlier than required and we keep our commitments that we make to the community. For example, Golden Oak Community School opened in September 2008. We developed a site and funded construction of the school, even before a house was built. Pardee Homes also recognizes it takes more than homes and streets to build a community. We also support the many elements that make up the fabric of a city or a region. For instance, last month we worked with the City of Santa Clarita and the Sherriff's Department to name a street at our Golden Valley Ranch project in honor of a fallen deputy. Here you see the deputy's sons pull away the drape revealing the street name. Part of our stewardship to the environment is Pardee Homes Living Smart program. Our Living Smart program involves four key areas of sustainable

construction. These features also mean lower energy and water cost for homeowners. Since the Living Smart program was pioneered, Pardee Home has developed or is committed to more than forty Living Smart neighborhoods and over 5,000 Living Smart homes. One of our elements of Living Smart program is water smart. This list shows some of the aspects of our water smart program. Pardee Homes brought to north Los Angeles County the first California Green Builder certified home. These homes are located in our Fair Oaks Ranch community in Santa Clarita. I should note that a California Green Builder certified home uses about 20,000 gallons less water a year than newer, similarly built non-green homes. As you can see, all of our efforts have resulted by being recognized by many organizations as an environmental-friendly builder. Our Skyline Ranch project will provide Santa Clarita with the items listed to your right, plus a new major road that will only help traffic circulation route on that side of the valley. In addition, we will add to the major trail network in this area of the Santa Clara Valley. As we look closer into our community, this map shows you several key features that will be included in our project. A neighborhood loop system, pocket parks, bike paths, trails or paseos connecting neighborhoods and the school, a turnkey elementary school, a community public park that will be constructed at the beginning. Here is a conceptual rendering of our community public park, which will include tennis courts, basketball courts, baseball courts, excuse me, basketball fields, multipurpose field, top-notch playgrounds and an amphitheatre. Skyline Ranch will provide more than 70 percent of its project as open space. In addition, we help secure the County's proposed SEA by acquiring lands from 36 different property owners. The SEA is outlined in red. Now, I would like to show you some photos of the planned open space. This is Plum Canyon Creek, Plum Canyon trail headed north, a view looking south into the open space, one of our vernal pools located on Cruzan Mesa aka Mystery Mesa, and finally I'll end this presentation with some of the testimonies made in the September public hearing. This is from the chair of the Canyon Country Advisory Committee. With that I'm available to answer any questions you might have and thank you.

Chairman Bellamy: Thank you. Any questions?

Commissioner Helsley: Mr. Chairman, could you go back to slide number 22 and 23 for me please? Are those of the same pool?

Jim Bizzelle: No they're not.

Commissioner Helsley: This is one that's down slope?

Jim Bizzelle: This actual pool is located more closer to Plum Canyon Creek, which would be, this is north looking up to Mystery Mesa. It's on the southwest on this photograph.

Commissioner Helsley: Thank you. And I would just make a point that I commend you on the bridge that you're planning to put in for the transportation of school children. Thank you.

Chairman Bellamy: Thank you. Can't hear you.

Charles Moore: Charles Moore. My business address is 2049 Century Park East, Los Angeles. Just very, very briefly, I think I must join Mr. Bizzelle in the commending staff. This project was applied for five or six years ago. It's undergone numerous reviews of the EIR and I think it's important to place it in its historical context. The application was filed at a time when the County was proposing a very controversial, widely publicized update of its significant ecological area maps. This project respected that proposed SEA boundary, and what you see is a development that was the result density transfers. The planning director personally, at the time it was Jim Hartl and Mr. Sanabria carried forward a very complicated density transfer in order to respect and protect that proposed SEA boundary. Unfortunately, the boundary is still proposed but Pardee has respected it and I think its will benefit generations. I remember Daryl Koutnick early on, we came to Daryl Koutnick, who was a biologist for the County at the time and I said, "Why is this SEA boundary so important?" to him. And I remember his words. He said that he felt that the vernal pools and the Mesa were the most important resource in the entire Santa Clarita Valley. I think this department and Pardee Homes are to be credited for the tremendous effort, it took a lot of time to devise the program, but I think the protection of these 1,700 acres of open space is a credit to everyone involved. To Mr. Helsley's point about preserving the roads on the plan of highways, initially Public Works was to bring forward in a general plan update the addition of Skyline Ranch and the illumination of the roads through the Mesa. Those

roads, even if they are deleted, still can be designed/devised in the future, but those roads I think are being removed with the tremendous support of Federal and State environmental agencies. The design is simply environmentally unacceptable to environmental agencies, and if there is a future need it probably could be addressed at a future time. I would like to just comment on Mr. Helsley's points concerning water supply. I'm very proud of our environmental consultants and our water supply experts. I know a few weeks ago this Commission was faced with an unfortunate need to postpone work on your OVOV plan because of CLWA's comments concerning the water supply analysis in the EIR. You'll note that CLWA is not similarly making a statement here. In fact, our water supply consultant works regularly with CLWA. There's not one statement about water supply that we have made either in the EIR or in updates or in various communications that we have not first put before CLWA. We, as a policy, never file anything about water supply without first ensuring the support of CLWA. I can confidently say that the EIR in its present form has the most up-to-date information. Today there is no more up-to-date information than what our supplements and addendas contain. That's not to say that there won't be additional information, and I am sure that as this case moves forward through the Commission, to Final EIR stage, and indeed through the Board of Supervisors, and indeed through final map processing, there will be a continuing of additional water supply information. The materials we supplied you I think are interesting from the Department of Water Resources as they attempt to digest the new water supply laws. So we expect regular updates, but I can confidently say there is no more current information available. With that I just want to thank staff again and recommend that you follow the recommendation of Susie Tae and we look forward to coming back as soon as possible. Hopefully, in January or February I suppose, with a Final EIR.

Chairman Bellamy: Any questions?

Commissioner Helsley: Mr. Chairman, you gave us a handout that was attached to your letter.

Charles Moore: Yes, Mr. Helsley, that's from the State.

Commissioner Helsley: And the Department of Water, California Department of Water Resources, and the last, I guess, three pages of it are something I think we have to really tee our water supply to, and that's the water bond, Safe, Clean, and Reliable Drinking Water Supply Act of 2010. But that's dependent upon the vote in November. So we won't know the answer to that in February. And, I think that that's a critical issue as we go forward with all but very, very small projects that are going to be requiring water. There was a comment that your homes save 200,000 gallons of water and that sounds like a big number, but if you consider that a home uses probably 320,000 gallons of water minimum, that number becomes another saving and I commend you for the saving, don't get me wrong there, but we're talking about something that's very small compared to the large use of the average residence in the state of California, Southern California. And so I still have concerns.

Charles Moore: Of course, and even the passage of the bond does not bring California home safe. It is a many year process, of course. It'll take the cooperation of all levels of government, the public as well. Take many years.

Chairman Bellamy: Thank you. The next two. Anyone else on the applicant's team that wishes to speak at this time?

Charles Moore: A consultant's here if you have any questions, but I think…

Chairman Bellamy: I'd like to call on Ian Perry from the City of Santa Clarita. Also Martin Rasnick, Tyler Gold, and the last speaker is Joyce Mason. Yes, sir, give your name.

Ian Perry: Good morning Chair Bellamy, members of the Commission. My name is Ian Perry. I am senior traffic engineer at the City of Santa Clarita. When I was here before you back in September, for the previous public hearing for this project, there were two issues that the City had from a traffic standpoint on the project. One was the proposed mitigation at Soledad Canyon Road and Sierra Highway, and the other was the cross-section of Skyline Ranch Road. I'm happy to report that we've been working very strongly with the applicant's engineer, Sikand Engineering, and have resolved the issue at Soledad and Sierra Highway. The City's now comfortable with the mitigation as shown, and it can fit within the existing right of way, and so

I1-4

we now accept that mitigation as it is designed. And the second item regarding the cross-section of Skyline Ranch Road as the County staff person mentioned during her presentation, the site plan currently shows two sets of cross-sections for Skyline Ranch Road: the County proposed section and the City's alternate section. While we are still working with County Public Works staff to reach a compromise, our goal is that the next time this project is before you for approval that there'll just be one set of cross-sections for Skyline Ranch Road that are agreed to by both the City and the County and you won't have to deal with the issue of two competing cross-sections. And so we're encouraged, we had a very productive discussion just yesterday afternoon with Steve Burger and Public Works staff. I'm working toward a compromise and so that is still the goal of both City and County staff. I1-5

Chairman Bellamy: Thank you. Any questions? Thank you very much. Yes, sir.

Martin Rasnick: Yes, good morning, my name is…sorry about that, my name is Martin Rasnick, I'm at Glenn Lukos Associates. I'm also part of the project team. I'm the jurisdictional delineation consultant. I wonder if you have any questions, I'm here to answer them. Thank you.

Chairman Bellamy: Questions? Thank you sir.

Martin Rasnick: Thank you.

Chairman Bellamy: Next two.

Tyler Gold: My name's Tyler Gold. I'm a landscape architect with L.A. Group Design Works. And I'm here to answer any of the questions you might have regarding the landscape . . . Thank you.

Chairman Bellamy: Yeah, last person. That concludes the speaker cards. Commissioner Modugno.

Commissioner Modugno: Thank you, Mr. Chairman. Thank you all for your presentations and for attendance today. The discussion back and forth on the water, and Mr. Moore, thank you very much for providing this information that Commissioner Helsley referenced. This is way beyond the scope of our pay range. I think it's way beyond this project, it is a very complex

issue that the State is wrestling with. The State wrestles with it with federal judges and protecting a species, you know, through a capriciousness and arbitrary sort of determination, water supply is yanked and added to and the City of Los Angeles is notified that its allocation is being cut down to 5% of its request. Various agencies have to deal with it. Water is something the State has lived with in terms of shortages and excesses throughout its history. I don't know if this will ever be concluded to the satisfaction of all parties. I think we have to move along with cases with information that we have and we have to rely upon those who are experts and I hope there will be a more recent update again by Castaic Lake Water Agency is going to be some providing as we look closer to the conclusion of this. I think this project as designed with its smart features is where we want to head with development. We didn't ask the landscape fellow questions, but I applaud the applicant and their consultants in terms of having the sensors on the sprinklers, to the extent to which there's going to be some drought tolerant plantings. There is other issues, and they seem to be things that the County is trying to promote, for instance type of housing that we'd like to see more of not less of. And to the extent to people move into this type of housing and move out of other housing that may then be recycled to other purposes or updated over time I think is going in the right direction. Let me state just a very, very minor, simple issue. When you talked about the driveways and making car clearance make sure that somewhere in that the garage doors are rollup doors because people tend to, if they don't have a rollup door, back up further and they don't get as close to it, so we want to make sure there is sufficient clearance on that because we don't want to block the sidewalks for it. I look forward to this project coming back to us, and in concluding I appreciate Mr. Perry's comments from the City of Santa Clarita in terms of working with Mr. Burger and hopefully there will be a resolution and we will only have one and we won't have to sort of decide, well do we want to go with the City or County on this one? But there is consistency on their part. Do we have the date certain?

Sorin Alexian: Yes, Mr. Chairman, Commissioners, I checked with staff and the earliest date that we feel we can come back with all the information would be the first meeting in March, that would be March 3rd. That's our recommendation.

Chairman Bellamy: If there are no other comments, I move that the Planning Commission continue the public hearing on the date certain of March 3, 2010 in order the technical, some technical clearance in the subdivision be received, interdepartmental engineering committee to meet for its recommendation to this body in preparation of filing an Environmental Impact Report with findings and facts, a statement of overriding considerations, and in draft findings and conditions for the project.

Commissioner Helsley: I second the motion, but I would like to have discussion.

Commissioner Esther Valdez: I'd like to just speak to that motion for a second. I'm obviously not a water expert and I'm sure we have many many wise water experts who've been working on this bond, etc. At what point do we stop and take a deep breath and consider how many more large subdivisions are we going to approve until we know what the real situation is with respect to water. And there is a secondary reason for that. This is a very big subdivision and I'm really proud of the kind of things that have put out and the SEA, etc. But, if we do have some very serious issues with water, etc., would we not want to consider additional restrictions on the use of water for large subdivisions? Would that not be something that would be wise and all? I think as we're going forward, it's just a comment that I have here in light of the dire straits that we have with respect to water. You know, we don't want to be accused at some point that we were frittering while Rome was burning, and we're not looking at implications of this, not because we would want to deny this subdivision at all, I would not say that, but I would at this point indicate would we want to increase the use of recycled water in the ways in which this subdivision is going to be constructed or even consider that if something happens we would be able to come back and add that. We don't know and there's such an uncertainty, and I understand that the developer wants to move forward, but in light of uncertainty, during this interim period that we're coming back, I'd like to think about that a little bit. There's a lot of

I1-6

homes that have built up over a great number of years I'm sure, and in our economy I doubt if they'll be building other phases or even two phases at the same time. But just a concern that I had, an overall concern, not just for this project, but as we're looking at other developments in going forward, so I support the motion for the continuance. I1-6 Cont'd

Commissioner Helsley: I support the motion, and I don't want you to get the idea that I dislike the development. I think this development is planned, it is taking in and coordinating very effectively with concerns that the County has, the concerns the community has had, and I think it's met many of those very, very effectively. I do have, maybe a little different position than Commissioner Modugno in that, I think we do have to say that before we consider land use is a reasonable use, that if there's no water available, we have a problem. At what point do we say no water is available? I don't think we're at that point yet, but I think we have a constraint on that water, maybe for the next eight to ten years that is going to be very, very strong, and I would hate to see a situation where we go with the landscaping that I see is projected and the nice homes, then all of a sudden find a very difficult thing for the family that moved in to have enough water to maintain those facilities. And so I think the legislature kind of said that as we do land use planning, they want us to be sure that there's an adequate water supply, and that they take that seriously. With the November election, I'm afraid I didn't have confidence in the people voting that in due to the pork that's been attached to that bill or that bond. I think that they've kind of been disingenuous in their saying that they solved the water problem, or have tried to solve the water problem, but that's my personal opinion. As we look at this, I think a comment in relation to reuse, I realize you don't have a treatment facility real close but it might be worthwhile putting in the piping, to have a reuse supply in the public medians and you have some fairly large community slopes that can be irrigated with reclaimed water. You have the potential as you build this, to build the homes or the lots so that they can have a system for water collection during the rainy season . . . I'm guessing it's not like Ohio where you get a rain every month or two. Now and if you get six weeks without water back there, why that's a drought. And here we go months and months and many months without water, and our vegetation has I1-7

adapted to that. But those are things that might maintain the green environment around the house a little more effectively. I don't know whether you want to be on the forefront of gray water use or that type of thing, but I think that's another thing that might be explored as this development moves forward. I greatly appreciate your extra effort in moving it off of the Mesa, and moving it down into the southern portion. The original general plan maps I think projected this development basically up on the Mesa. And I commend you for really working diligently to put it down into close contact with other developments.

I1-7 Cont'd

I1-8

Chairman Bellamy: This concludes our discussion. All in favor of the motion?

All: Aye.

Chairman Bellamy: Thank you. We're going to take a ten minute break.

[Ten minute break]

I. PUBLIC HEARING BEFORE THE REGIONAL PLANNING COMMISSION (DECEMBER 16, 2009)

RESPONSE NO. I1-1

This request will be incorporated by the Department of Regional Planning, Land Division Section as a condition of project approval.

RESPONSE NO. I1-2

The Draft EIR addressed pump stations and fire flow pressures in Sections 4.I, Water Resources and 4.M, Fire Services and Hazards. As indicated on page 4.I-43 of the Draft EIR, In order to provide sufficient amounts of water and adequate water pressure to the project, a series of on-site water booster/pump stations and water tanks are proposed, including a two-million gallon water tank in the northwestern portion of the site and two one-million gallon tanks in the northeastern portion of the site. As determined by the Santa Clarita Water Division and in compliance with Los Angeles County Fire Department (LACoFD) requirements, the project would meet the fire flow requirements of 1,250 gallons per minute and 20 pounds per square inch for a duration of two hours. (See pages 4.M-10 and 4.I-43 of the Draft EIR.) In addition, project plans would be reviewed by the LACoFD prior to the issuance of building permits to ensure adequate fire flow (as also specified under Mitigation Measure 4.M-1(b). Therefore, impacts related to water supply infrastructure and fire flow would be less than significant. Based on additional refinements to Figure 4.I-2, Conceptual Water Plan, since publication of the Draft EIR the alternative booster station in the northwestern portion of the development area is now designated as a booster station and the booster station on the center of the development area is now designated as an alternative booster station. Please refer to revised Figure 4.I-2, Conceptual Water Plan in Chapter 3.0, Correction and Additions to the Draft EIR, in this Final EIR.

RESPONSE NO. I1-3

The removal of Cruzan Mesa Road has been considered by the County Department of Public Works and was described in Chapters 2.0, Project Description and 4.F, Traffic Access with supporting data provided in Appendix F of the Draft EIR. As stated on page 4.F-39 of the Draft EIR, "[This] future roadway segment, as currently shown on the Highway Plan, [has] been recommended for elimination by the County due to the amount of grading that would be required and the impact the proposed alignment would have on sensitive biological resource areas." As shown on the Draft Highway Plan and as proposed by the project, Whites Canyon Road would extend from Plum Canyon Road on the west to the southeast and through the project site as Skyline

Ranch Road, ultimately connecting to Sierra Highway. A comparison of long range average daily traffic volumes under the current plan and the proposed project alignment was described on pages 4.F-39 through 4.F-42 and shown on Figure 4.F-14 and Table 4.F-11 of the Draft EIR. As concluded in this discussion, the proposed alignment would result in reduced traffic volumes on the surrounding roadway system in some locations and increased volumes in other locations. However, the project alignment would carry a higher volume of through traffic than the current plan.

RESPONSE NO. I1-4

Comment noted.

RESPONSE NO. I1-5

The applicant, the County Department of Public Works, and City of Santa Clarita are continuing to work together to resolve issues regarding the specifics of the design of Skyline Ranch Road.

RESPONSE NO. I1-6

Please see Response to Comment H1-20 regarding the analysis of water supply. As concluded in this response, although impacts on water supply would be less-than-significant, additional mitigation measures are proposed due to local and regional drought conditions. Regarding the use of recycled water, please see Response to Comment I1-7.

RESPONSE NO. I1-7

The applicant is considering the feasibility of providing infrastructure for the potential future use of reclaimed water. Long-range plans identify recycled water infrastructure in the vicinity of the project site. The Castaic Lake Water Agency's (CLWA) Recycled Water Master Plan (*CLWA Draft Report, Recycled Water Master Plan, Kennedy-Jenks Consultants, May 2002*) shows that an 8-inch recycled water pipeline is planned for White's Canyon Road, south of the project site, at which point it veers east, ending just west of the site's southerly border and a 24-inch line is planned to end south of the site along the Sierra Highway, north of its intersection with Soledad Canyon Road. The final layout would be determined once this phase of the Recycled Water Master Plan was ready to be developed and once specific customers were identified.

The feasibility of using recycled water from these lines depends on multiple factors, including the timing of the proposed development in relation to the timing of the recycled water

infrastructure. CLWA is currently designing Phase 2a of the Recycled Water Master Plan, which would serve the area along Newhall Ranch Road. Phase 2b is planned to connect to the Honby Booster Pump Station and would extend farther to the east. The 8-inch and 24-inch pipelines described above may be connected to Phase 2b. The schedule for Phase 2b has yet to be determined, however, and it is contingent upon the results of a flow study being conducted for Phase 2a. Additionally, the site's topography may prove to be a constraint. As shown in the Recycled Water Master Plan, the proposed 8-inch and 24-inch recycled water lines would terminate near a reservoir located at a 1680-foot elevation. The portion of the Skyline Ranch site that would be developed contains elevations that are up to several hundred feet higher. The engineering feasibility of connecting the project site to the recycled water infrastructure would need to be evaluated. Should providing recycled water prove to be technically and economically feasible based on timing and engineering considerations, there should be no constraints to recycled water being made available to the site (personal communication, Jeff Ford, CLWA, January 27, 2009).

RESPONSE NO. I1-8

Comment noted.

3.0 CORRECTIONS AND ADDITIONS TO THE DRAFT EIR

This chapter provides changes or additions made to the Draft EIR based on comments received during the public review period, as well as other edits to provide additional clarification. Deletions are shown with ~~strikethrough~~ and additions are shown with underline. Changes to the Draft EIR are indicated below under the respective EIR section heading. The revisions are minor changes that do not constitute significant additional information that alter the outcome of the environmental analysis or require recirculation of the document (CEQA Guidelines Section 15088.5).

EXECUTIVE SUMMARY

Pages ES-12 and ES-13, Table ES-1, Environmental Impact column (B. Hydrology and Water Quality) and corresponding Mitigation Measure column (4.B-1) have been revised as follows:

> Construction of the proposed project would not have a significant impact on flow rates for a 50-year storm within the five watersheds that would be affected by the project. In addition, the project would not change drainage patterns in a manner that would increase flood potential. However, the proposed project could have an effect on Sierra Highway in an area that is designated as a FEMA ~~AO~~ Flood Zone A, which is defined as subject to 100-year ~~shallow~~ flooding, due to construction of Skyline Ranch Road. In order to achieve the grade necessary to connect this roadway to the proposed developed areas of the site, an area of fill would be required near the roads intersection with Sierra Highway. This potential for displacement of flood plain area is considered a significant impact.
>
> **4.B-1:** Final drainage improvement plans for the project shall ensure that there is no displacement of flood plain area in the vicinity of Sierra Highway and its intersection with proposed Skyline Ranch Road through construction of a culvert, bridge, or combination thereof, within the flood plain area. Final drainage improvement plans and the culvert or bridge shall be designed during the engineering stage by a licensed engineer to ensure that the water surface shall be equal or lower than existing conditions both downstream and upstream of the proposed project entrance along Sierra Highway and adjacent properties during a 50-year storm event and that post-development flow rates shall be less than existing conditions downstream along Sierra Highway and adjacent properties. Final drainage improvement plans to achieve these standards shall

be designed to the satisfaction of, and approved by, the Los Angeles County Department of Public Works and City of Santa Clarita, Department of Public Works.

Pages ES-32, Table ES-1, Environmental Impact column (C. Biological Resources) column has been revised as follows:

The proposed project would have the potential to result in indirect impacts to biological resources as a result of construction activities and development of the site associated with drainage (increased urban run-off and pollutant concentration), lighting, noise, barriers, ~~invasive species,~~ and ~~brush management~~ introduced humans and pets. However, as further discussed in Section 4.C, Biological Resources, these indirect impacts were determined to be less than significant.

Pages ES-43and ES-44, Table ES-1, Mitigation Measure column (4.D-2(a), 4.D-2(b), and 4.D-2(c) have been revised as follows:

4.D-2(a) Paleontological Survey and Treatment Program. Prior to the implementation of grading or construction related activities, a qualified paleontologist shall be retained by the applicant to survey the project area to relocate known fossil localities, and determine the most sensitive areas. A qualified paleontologist is defined as a paleontologist meeting the criteria established by the Society for Vertebrate Paleontology including institutional affiliations/credentials, ability to recognize and recover vertebrate fossils in the field, local geological and biostratigraphic expertise, proficiency in identifying vertebrate fossils, publications in scientific journals. Following the survey, a paleontological resources monitoring and mitigation program will be developed by the qualified paleontologist that will include salvage of known fossil resources, areas that will be monitored during project-related earth-moving activities. The paleontological resources monitoring and mitigation program shall be submitted to the County for review and approval prior to construction grading activities. The program shall define specific procedures for construction monitoring; emergency discovery; sampling and data recovery, if needed; museum storage of any specimen and data recovered; preconstruction coordination; and reporting. Any curation costs shall be incurred by the applicant.

4.D-2(b) Paleontological Monitoring. The ~~paleontologist~~ paleontological monitor, who has been trained by a qualified paleontologist to identify invertebrate fossils, shall monitor earth-moving construction activities at depths determined to be sensitive as specified in the County approved monitoring plan. Monitoring will not be conducted in areas where the ground has been previously disturbed

or in areas where exposed sediment will be buried, but not otherwise disturbed.

4.D-2(c) Paleontological Data Recovery. Prior to the start of grading or construction related activities, construction personnel involved with earth-moving activities shall be informed of procedures to follow if fossil remains are encountered. In the event that paleontological resources are encountered during construction-related earth-moving activities, all work shall cease within the immediate area and be redirected elsewhere until the paleontological monitor has evaluated the situation and provided recommendations for the protection of, or mitigation of adverse effects to, significant paleontological resources assessed. Upon such discoveries, the contractor shall notify the applicant and Los Angeles County. Procedures for mitigating potential impacts to significant paleontological resources shall follow the monitoring and mitigation program previously developed under this mitigation measure. Construction work within this area shall resume upon approval from the principal project ~~paleontologist~~ paleontological monitor.

Because initial site access for approximately 300 units would be provided from Whites Canyon Road/Plum Canyon Road to the west, page ES-48, Table ES-1, Environmental Impact column (F. Traffic/Access) and corresponding Mitigation Measures column (4.F-2(b)) have been revised as follows:

The proposed project would construct a network of collector roads to provide local access and construct an important regional roadway improvement long planned by the County to extend Whites Canyon Road (as Skyline Ranch Road). The provision of access to the proposed project during the later construction phases would also require intersection improvements at Skyline Ranch Road at Sierra Highway, which should be designed to accommodate the eventual widening of Sierra Highway.

4.F-2(b) Sierra Highway at Skyline Ranch Road: Prior to the issuance of the ~~first~~301st building permit the project shall construct a new intersection for project access; provide one northbound left-turn lane, two northbound through lanes, two southbound through lanes, one eastbound left-turn lane, and two eastbound right-turn lanes; and install a traffic signal. The placement of the new west leg should be of sufficient distance from the Sierra Highway centerline to allow for the eventual addition of a third southbound through lane as identified in the City of Santa Clarita General Plan Circulation Element.

Page ES-50, Table ES-1, Environmental Impact column (F. Traffic/Access) has been revised as follows to include the provision of a pedestrian bridge:

Pedestrian access routes to the proposed elementary school on-site would be provided by fully improved streets with full-width sidewalks and a pedestrian bridge across Skyline Ranch Road for residential areas north and east of Skyline Ranch Road. Pedestrians crossing Skyline Ranch Road would be able to use the pedestrian bridge, crosswalks or the traffic signal adjacent to the school at Skyline Ranch Road and Main Street South. Compliance with the Caltrans Pedestrian Safety manual would ensure that impacts related to pedestrian safety would be less than significant. In addition, and independent of the proposed project, a traffic study addressing the school site will be required by the County when a detailed site plan for the school is developed by the District.

Page ES-68, Table ES-1, Environmental Impact column (M. Fire Services and Hazards) has been revised as follows:

The project's residents would increase the demand for Los Angeles County Fire Department (LACoFD) staffing, equipment, and facilities. As such, the proposed project would potentially result in deficiencies in fire service. The project would be required to pay fees pursuant to the Los Angeles County Fire Department's Developer Fee Program, which would be used toward land acquisitions, ~~facility improvements~~ new facilities, and ~~partial funding of new~~ equipment. However, while ~~general fund~~ these revenues have historically supported adequate levels of fire protection services in the area, if sufficient funding for LACoFD services is not maintained by the County, a potentially significant impact could occur.

Page ES-72, Table ES-1, Environmental Impact column (P. Parks) has been revised as follows:

Based on the Los Angeles County Code (LACC) park requirement formula, the proposed project is required to provide 12.23 net acres of on-site park space that meets Los Angeles Department of Parks and Recreation (LADPR) criteria. The proposed project would provide approximately 18 acres of park space, including a fully improved ~~10.6~~ 9.2 acre public park. Because the ~~10.6~~ 9.2 acres of public park space is less than the 12.23 acres required by LADPR, payment of in-lieu fees would also be required. With the payment of fees and development and conveyance of a fully-improved park to LADPR, impacts related to the provision of parks and recreational facilities would be less than significant.

1.0 INTRODUCTION

Page 1-1 has been revised as follows:

A. PURPOSE AND OVERVIEW OF THE EIR PROCESS

The County of Los Angeles is the Lead Agency under the California Environmental Quality Act (CEQA) for the Skyline Ranch project. The 2,173-acre Skyline Ranch site is located in the Santa Clarita Valley west of Sierra Highway, north of Highway 14 (Antelope Valley Freeway) and the City of Santa Clarita in unincorporated Los Angeles County. The project applicant proposes to develop approximately 622 acres of the site with 1,260 single-family residential lots with pads ranging in size from 5,775 to 7,350 square feet along with an approximately 11-acre elementary school site, approximately 12 acres (~~10.3~~ 9.2 net) of public parkland to be dedicated to the Los Angeles County Department of Parks and Recreation, and approximately 6 acres of private parkland to be maintained by a homeowners' association. Nearly three quarters of the site, the northern 1,551 acres located in the northern portion of the site, is proposed to remain undeveloped, with 1,355 acres dedicated or designated as natural open space through the proposed establishment of the Skyline Ranch Conservation Area (SRCA). Approximately 166 acres in the northern portion of the site on Cruzan Mesa would remain undeveloped and designated as a Non-Development/Continuing Use Area. Also in the northern portion of the site, approximately 22 acres would be preserved as a Mitigation Exchange Area for 22 acres of preserve area within adjoining recorded Tract 46018, that would be disturbed due to the construction of Skyline Ranch Road.

2.0 PROJECT DESCRIPTION

Section 2.0, Project Description, pages 2-4 through 2-36 of the Draft EIR have been revised to show minor revisions and clarifications primarily based on additional details for the construction of the Mint Canyon Trail trailhead; additional entitlements required for Skyline Ranch Road, off-site grading, and the materials processing facility; and the provision of a pedestrian bridge across Skyline Ranch Road to the proposed school site. New or revised figures are indicated in the figure title and provided within this section of the Final EIR.

B. PROJECT OBJECTIVES

Section 15124(b) of the *State CEQA Guidelines* requires that an Environmental Impact Report (EIR) include a statement of the objectives, including the underlying purpose of the project. Presented below are the objectives of the proposed project:

1. Land Use Planning Objectives

- Develop in a location that is adjacent to existing and planned infrastructure, urban services, transportation corridors, and major employment centers.
- Cluster development within the site to preserve significant biotic resource areas and other natural open space while reducing landform alteration and avoiding a scenic ridgeline.
- Provide development and transitional land use patterns that are compatible with surrounding communities and land uses.
- Increase the supply of housing to serve existing demand and future needs associated with forecasted population growth in the Santa Clarita Valley.
- Provide sites for a public elementary school and a public park to serve residents of the project and others in nearby communities.
- Create a pedestrian friendly environment which encourages pedestrian access between neighborhoods, parks, and a public elementary school.

2. Mobility Objectives

- Provide a major regional roadway improvement that will also serve the site, consistent with the alignment being proposed in the County's Draft Highway Plan.
- Provide a safe, walkable community, through the use of enhanced landscaped sidewalks and paseos segregated from vehicle traffic.
- Enhance pedestrian safety through the use of innovative traffic calming techniques, which may include roundabouts, designed to slow traffic while providing continual traffic flow.
- Provide bike lanes and an extension of existing bus service along Skyline Ranch Road to facilitate the use of alternative transportation.

3. Park and Recreation Objectives

- Provide on-site recreational opportunities, including an improved public park, private passive neighborhood and pocket parks, and hiking trails convenient and accessible to residents.

- Support extension of the County Trail System (Mint Canyon Trail) by dedicating an easement in the northern portion of the site to the County from Vasquez Canyon Road to the Plum Canyon Fire Road and southwesterly to a lookout point (approximately ~~2.2~~2.5 miles).

4. Resource Conservation Objectives

- Avoid development in regionally significant biotic resource areas located on Cruzan Mesa by designating a 166-acre portion of the site as a Non-Development/Continuing Use Area.

- Preserve other significant biotic resources in the northern portion of the site through establishment of one or more voluntary conservation easements, land dedications, or land set asides over a 1,355-acre area to be known as the Skyline Ranch Conservation Area (SRCA).

- Promote water conservation through use of drought-tolerant, fire-retardant, and native plants.

- Promote energy reduction, sustainable building practices, health enhancement, and water conservation into housing design, construction, and operation to reduce greenhouse gas emissions, while also reducing the operating and maintenance costs of housing.

- Provide landscaping along the perimeter of the site with a mix of native, drought-tolerant, low-fuel, and non-invasive plant species to serve as buffer between improved areas of the site and adjacent natural open space in order to protect sensitive biotic resources.

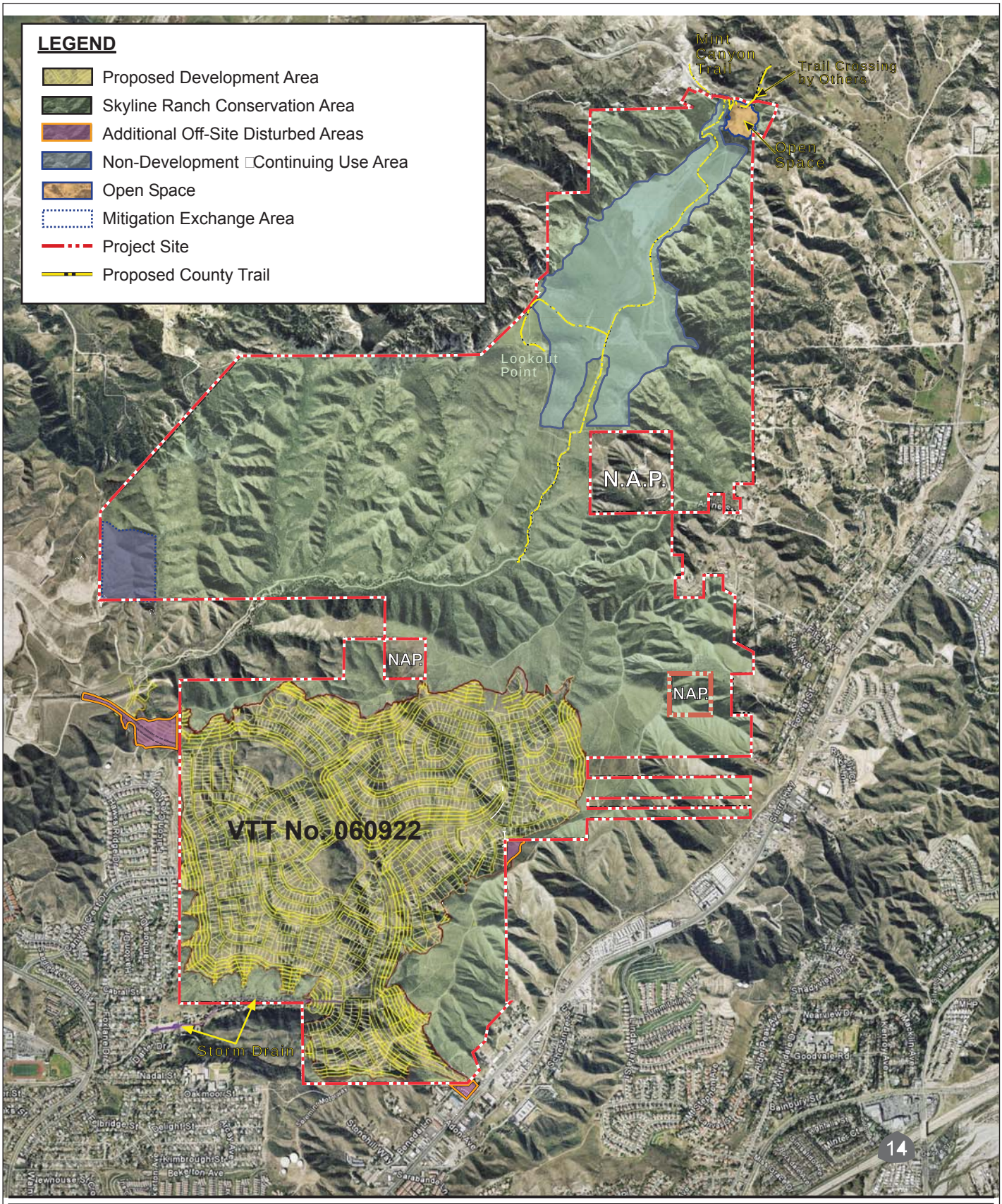
C. PROJECT CHARACTERISTICS

The project applicant proposes to develop approximately 622 acres of the site with 1,260 single-family residential lots with pads ranging in size from 5,775 to 7,350 square feet, an approximately 11-acre elementary school site, approximately 12 acres of fully improved public parkland to be dedicated to the Los Angeles County Department of Parks and Recreation, and approximately 6 acres of private parkland to be managed by a homeowners' association. Development is proposed for the southern portion of the property where slopes of 25 percent or less predominate. As further described below, nearly three quarters of the site (the northern 1,551 acres) is proposed to remain undeveloped, with approximately 1,355 acres dedicated or designated as natural open space through establishment of the Skyline Ranch Conservation Area (SRCA). The SRCA would be managed, as appropriate, to preserve the natural open space.

Approximately 166 acres in the northern portion of the site on the Cruzan Mesa, would remain undeveloped and designated as a Non-Development/Continuing Use Area. Also, within the northern portion of the site approximately 22 acres would be preserved as a Mitigation Exchange Area for 22 acres of preserve area within adjacent recorded Tract 46018, that would be disturbed due to the construction of Skyline Ranch Road. These three areas would preserve nearly all of the undeveloped areas of the site and simultaneously provide approximately 80 percent of the lands being proposed by the County for establishment of the Cruzan Mesa Vernal Pools Significant Ecological Area (SEA). Figure 2-3 (Revised), Aerial View—Development and Conservation Areas, on page ~~2-7~~ 3-9 presents an aerial view showing the southern portion of the site proposed for development and the northern portion of the site that includes the proposed SRCA and other open space areas. Also shown on Figure 2-3 (Revised) is a proposed trailhead entrance and trail that would extend the existing Mint Canyon Trail from Vasquez Canyon Road to the Plum Canyon Fire Road primarily along an existing dirt path and southwesterly towards a lookout point. The proposed trail extension would run a total distance of approximately ~~2.2~~2.5 miles within portions of the SRCA and Non-Development/Continuing Use Area. As detailed in Figure 2-4 (New), Mint Canyon Trail Entrance, on page 3-10, the proposed trail extension would include a 1,400 linear feet switchback trail with a variable width of 6-8 feet at the Mint Canyon Trail trailhead entrance at Vasquez Canyon Road.

The Vesting Tentative Tract Map No. 060922 (~~Figure 2-4~~ Figure 2-5 (Revised), Vesting Tentative Tract Map No. 060922, on page ~~2-10~~ 3-11), subdivides the development area of the project property into 1,313 lots, including 1,260 residential lots, 10 lots for park areas, 1 lot for a school site, 13 debris basin lots, 4 water tank/booster pump station lots, and 25 open space lots.[4] Primary access to the tract is provided by the proposed extension of Whites Canyon Road from Plum Canyon to the southeast through the project interior ultimately connecting to Sierra Highway. A detail of the proposed entry and other offsite improvements is shown on ~~Figure 2-5~~ Figure 2-6, Proposed Entry and Other Off-Site Improvements, on page ~~2-11~~ 3-12. These include cul-de-sac improvements at Canyon Crest and Bookham Drive and a cul-de-sac and hammerhead turnaround at Beneda Lane; a 78-inch storm drain and trapezoid channel that extends southwest approximately 1,300 feet off-site and discharges into an existing County flood control channel parallel to Goodvale Road and storm drains within Bookham Drive and Bakerton Avenue that would connect to the on-site storm drain system; proposed water lines within Sierra Highway; and downsizing an existing debris basin at the easterly terminus of Foxlane Drive.

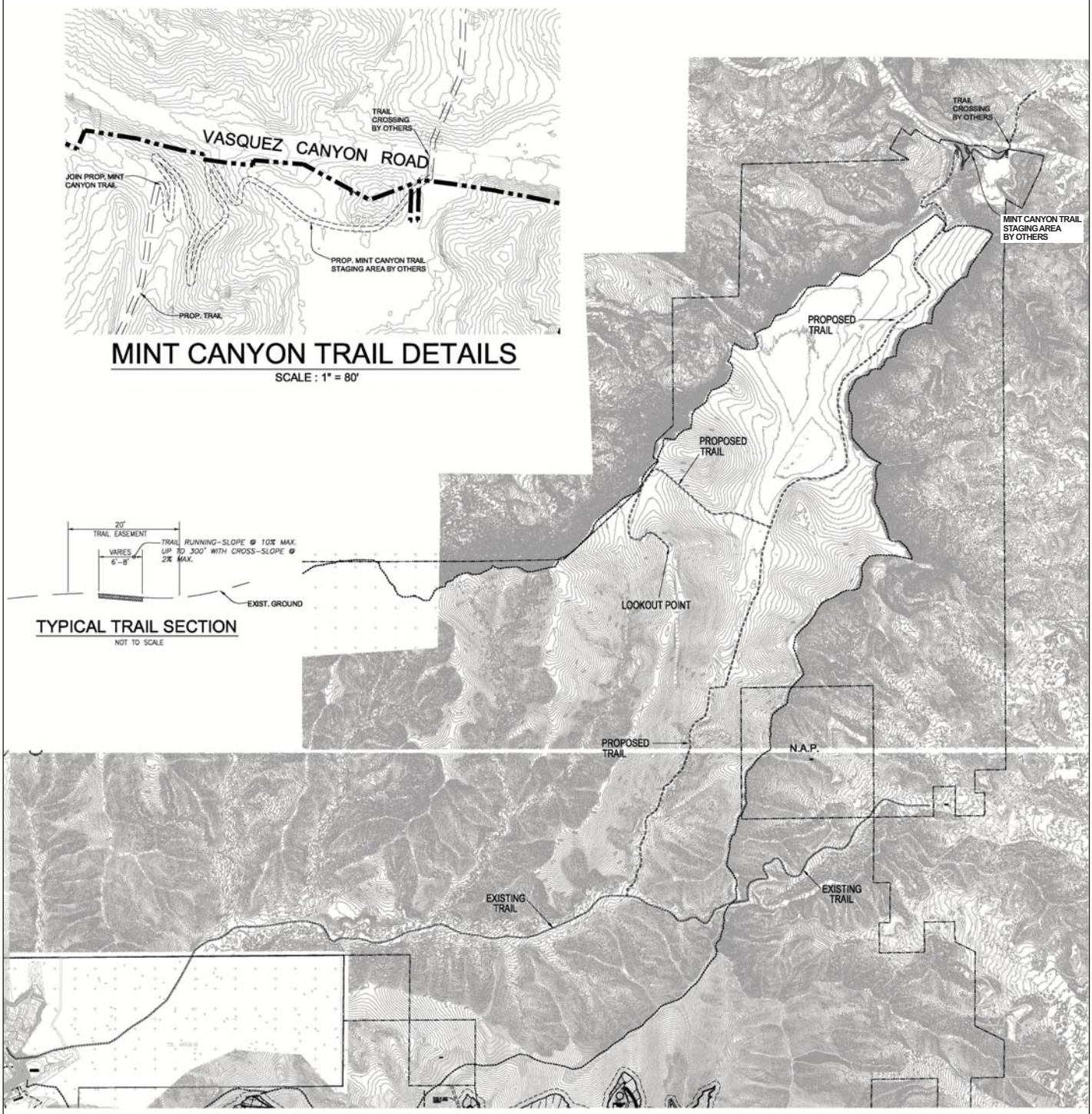
[4] *The number and size of lots within Vesting Tentative Tract Map No. 060922 may be subject to change; however such changes would not increase the number of residential lots, decrease the amount of open space or parks, or alter the overall footprint of the approximate 622 acre area proposed for development. In addition, the location of the proposed 11-acre school site may be subject to change within the development area based on the determination of the Sulphur Springs School District, Office of the State Architect, and County of Los Angeles; however the size of the site to be conveyed to the District would remain the same.*



PCR

Figure 2-3 (Revised)
Aerial View - Development and Conservation Areas

Source: PCR Services Corp., Sikand Engineering, and NRC, 2009

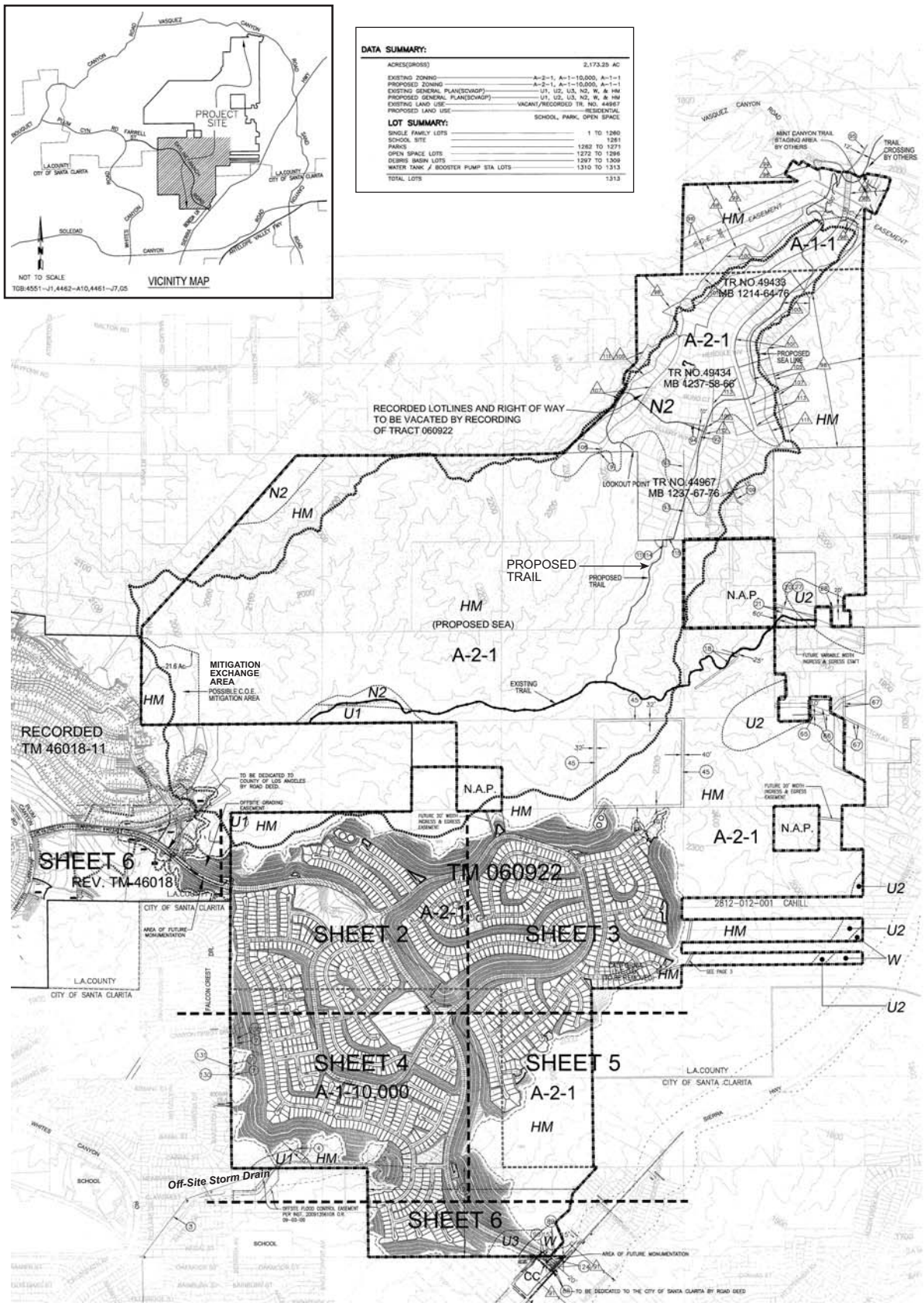


PCR

N

Figure 2-4 (New)
Mint Canyon Trail Entrance

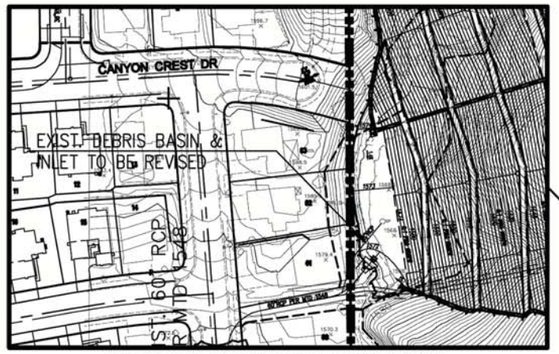
Source: Sikand Engineering, 2009



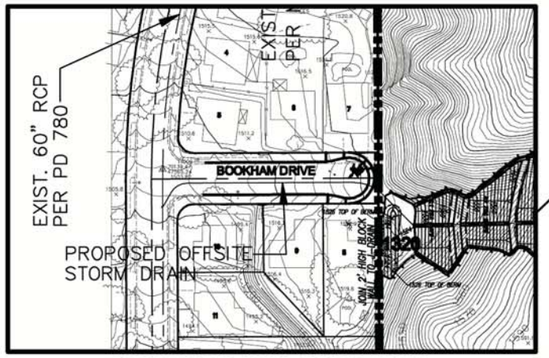
PCR

Figure 2-5 (Revised)
Vesting Tentative Tract Map No. 060922

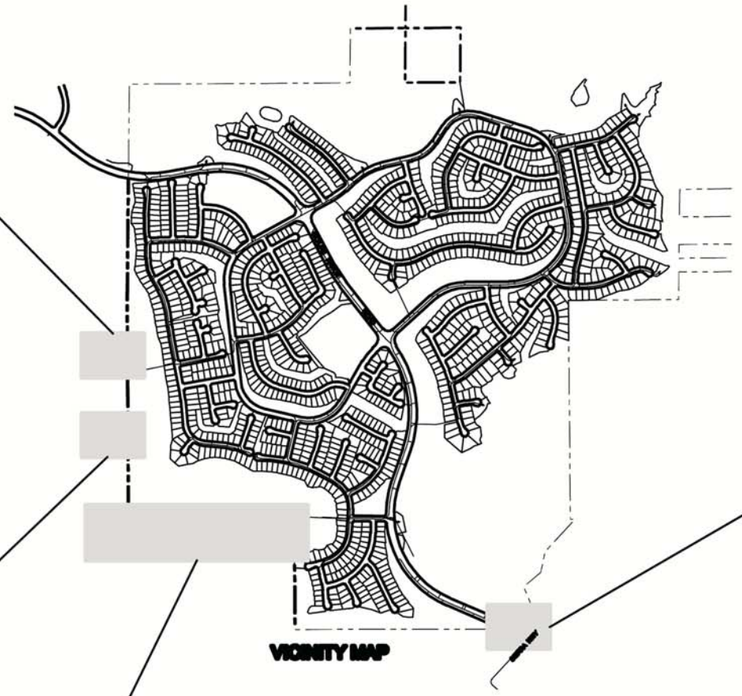
Source: Sikand Engineering, 2009



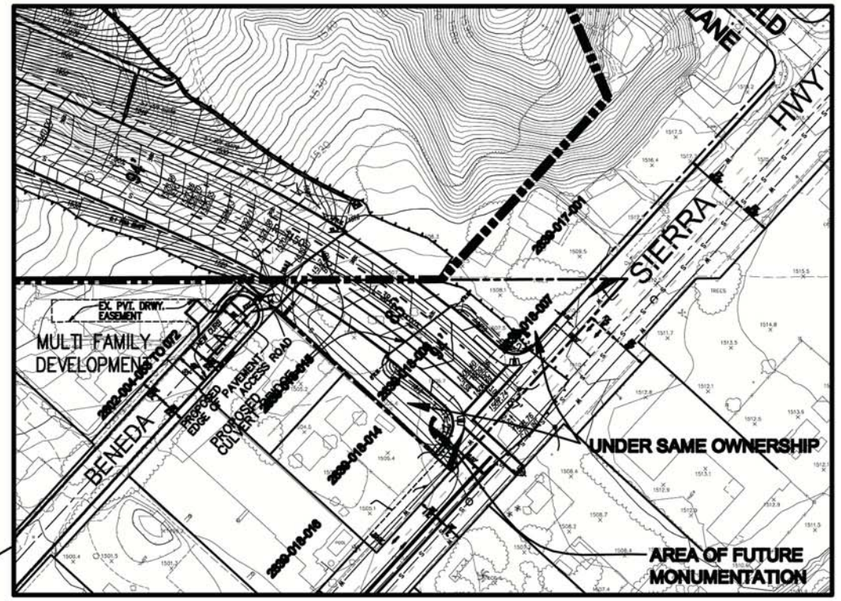
CANYON CREST DR. EX. TURNAROUND



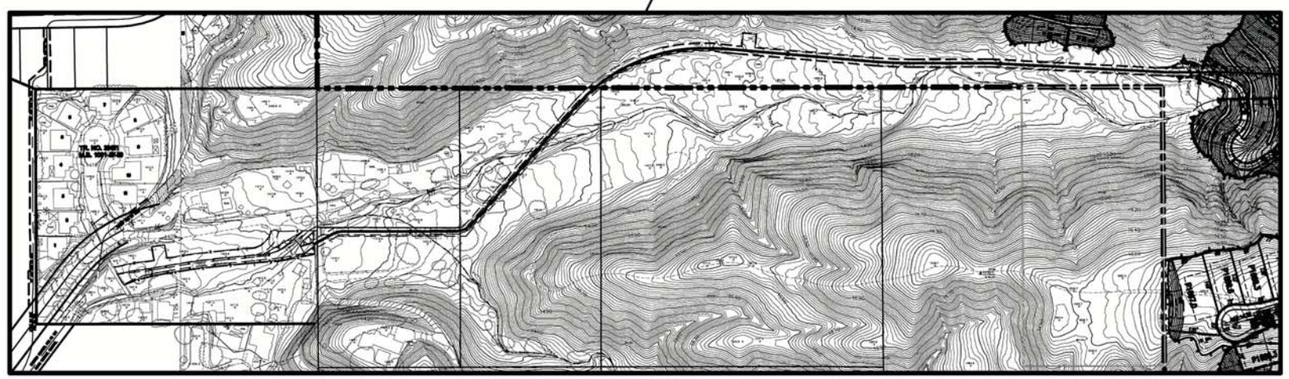
BOOKHAM DR. PROP. TURNAROUND



VICINITY MAP



PROP. SKYLINE RANCH ROAD/SIERRA HWY. INT.



PROP. 76" STORM DRAIN

PCR

Source: Sikand Engineering, 2009

Figure 2-6
Proposed Entry and Other Off-Site Improvements

Table 2-1, Skyline Ranch Project Land Use Summary, on page ~~2-12~~ 3-14 provides a breakdown of the proposed project's land uses. The primary components of the project are described in more detail below.

1. Proposed Land Uses and Improvements

a. Residential Land Uses

The 1,260 single-family homes would be characterized by a traditional lot orientation at net densities ranging from 3.0 to 4.0 dwelling units per acre on lots with pads ranging in size from 5,775 to 7,350 square feet. All lots are proposed to be located along public streets. There would be a mix of housing types with three to six bedrooms. Homes would be one or two stories and would range in size from 2,400 square feet to 4,700 square feet. An illustrative conceptual site plan of the proposed residential development is depicted in ~~Figure 2-6~~ Figure 2-7, Skyline Ranch - Conceptual Site Plan, on page ~~2-13~~ 3-15.

As further described in Section 4.Q, Land Use, the proposed project includes a proposed density transfer of 200 residential units from recorded Tract Map No. 44967, which is located within the proposed northern open space area of the site. Additional density would also be transferred from other areas of the site designated for Urban, Floodway, and Non-Urban uses.

The transfer of urban density within the project site is considered appropriate and supportive of County policies by concentrating development proximate to urban areas, preserving regionally significant biotic resources and open space proposed to be incorporated into a County SEA, avoiding a major ridgeline and areas prone to flooding, and substantially reducing grading and associated impacts that would otherwise be required to serve more remote areas with urban infrastructure.

The preliminary landscape design concept for the project, also shown on ~~Figure 2-6~~ Figure 2-7, is intended to create an aesthetically pleasing and highly livable residential environment. This would be achieved through a combination of streetscape elements, enhanced landscaped pedestrian circulation routes (such as paseos and parkways), parks, and common area landscaping. Along the perimeter of the site, landscaping would consist of a mix of native, drought-tolerant, low-fuel, and non-invasive plant species that would provide a transition between natural open space areas and improved areas of the site while supporting biological resource, aesthetic, and fire safety priorities. Within the residential community, landscaping would be provided along the streets and manufactured slope areas.

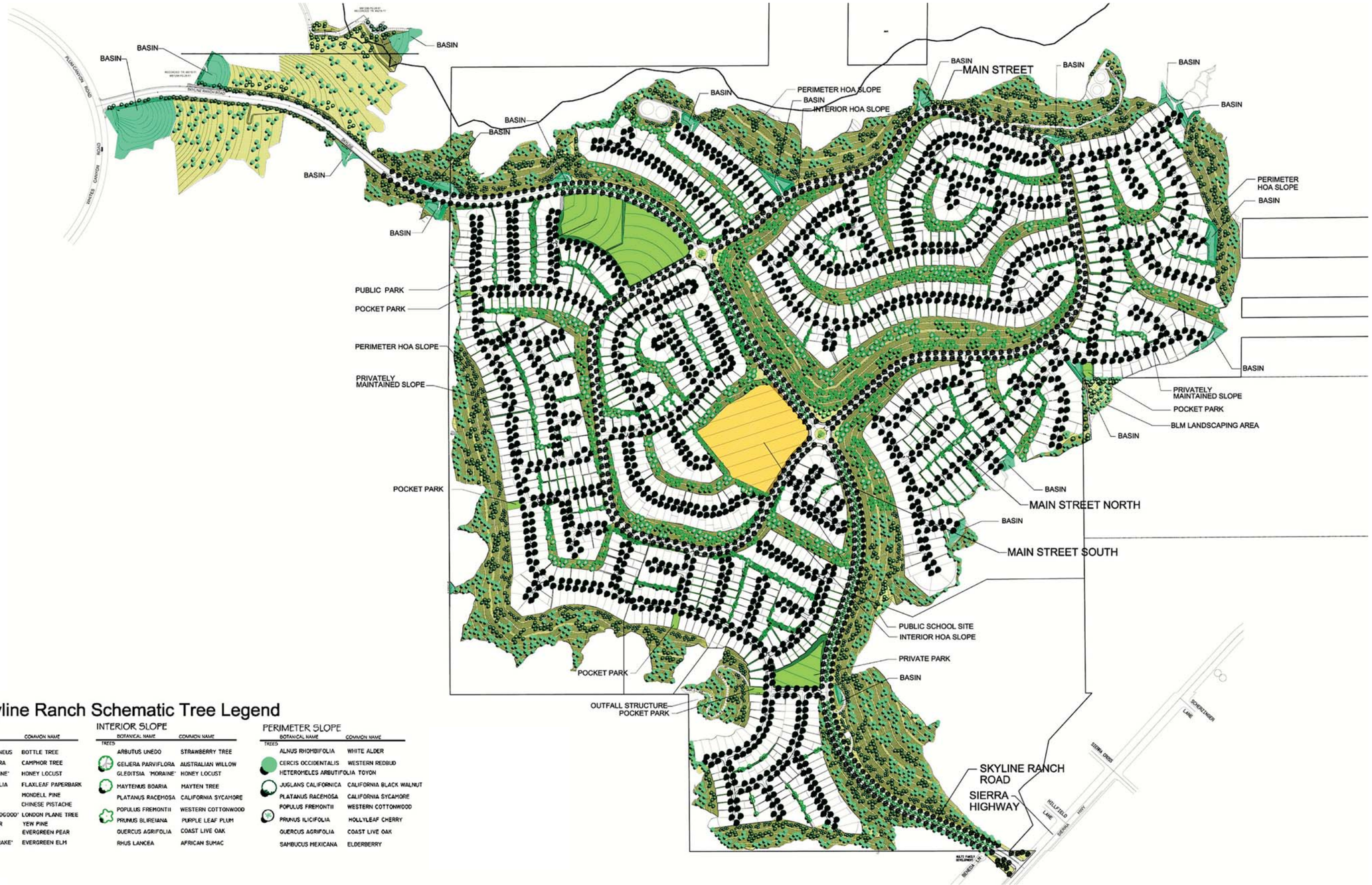
Table 2-1

Skyline Ranch Project
Land Use Summary

DEVELOPMENT AREA	
Residential Lots	
Number of Single Family Lots	1,260
Total Area of Pads/Side Lot Slopes	11,582,604 s.f. (265.9 acres)
Percent of Total Site	12.2%
Range of Pad Sizes	5,775 s.f. to 7,350 s.f.
Average Pad Area	9,253 s.f.
Range of Pad Widths	55 feet – 70 feet
Average Pad Depths	105 feet
Common Area – Roads (Private)	
Road Rights-of-Way	5,074,740 s.f. (116.5 acres)
Percent of Total Site	5.4%
Range of Road R-O-W Widths	58 feet to 94 feet
Paved Road Area/Bike Lanes	3,007,884 s.f. (69.0 acres)
Sidewalks	935,044 s.f. (21.5 acres)
Parkways	1,132,560 s.f. (26.0 acres)
Common Area	
Landscaped Slopes	8,746,848 s.f. (200.8 acres)
Debris Basin Lots	304,920 s.f. (7.0 acres)
Water Tank Lots	91,476 s.f. (2.1 acres)
School	505,296 s.f. (11.6 acres)
Parks	778,417 s.f. (17.9 acres)
Percent of Total Site	11.0%
Total Development Area	621.8 acres
Percent of Total Site	28.6%
OPEN SPACE AREA	
Open Space (All natural/undeveloped)	
Total Open Space Area	67,579,855 s.f. (1,551.4 acres)
Percent of Total Site	71.4%
Total Site Area	**2,173.3 acres**

Note: Total site area does not include off-site areas to the west (29.5 acres) and south (1.4 acres) associated with the extension of Whites Canyon Road to Sierra Highway, 2 acres of manufactured slope/drainage area to the east, or 0.88 acres (approximately 1,300 linear feet) to the southwest required for the 78-inch storm drain and related improvements.

Source: Sikand Engineering, 2009.



Skyline Ranch Schematic Tree Legend

STREET TREES

BOTANICAL NAME	COMMON NAME
TREES	
BRACHYCHITON POPULNEUS	BOTTLE TREE
CINNAMOMUM CAMPHORA	CAMPHOR TREE
GLEDITSIA TRI. 'MORAINE'	HONEY LOCUST
MELALEUCA LINARIIFOLIA	FLAXLEAF PAPERBARK
PINUS ELDARICA	MONDELL PINE
PISTACHA CHINENSIS	CHINESE PISTACHE
PLATANUS ACE. 'BLOODGOOD'	LONDON PLANE TREE
PODOCARPUS GRACILOR	YEW PINE
PYRUS SPP.	EVERGREEN PEAR
ULMUS PARVIFOLIA 'DRAKE'	EVERGREEN ELM

INTERIOR SLOPE

BOTANICAL NAME	COMMON NAME
TREES	
ARBUTUS UNEDO	STRAWBERRY TREE
GEIJERA PARVIFLORA	AUSTRALIAN WILLOW
GLEDITSIA 'MORAINE'	HONEY LOCUST
MAYTENUS BOARIA	MAYTEN TREE
PLATANUS RACEMOSA	CALIFORNIA SYCAMORE
POPULUS FREMONTII	WESTERN COTTONWOOD
PRUNUS BLIREIANA	PURPLE LEAF PLUM
QUERCUS AGRIFOLIA	COAST LIVE OAK
RHUS LANCEA	AFRICAN SUMAC

PERIMETER SLOPE

BOTANICAL NAME	COMMON NAME
TREES	
ALNUS RHOMBIFOLIA	WHITE ALDER
CERCIS OCCIDENTALIS	WESTERN REDBUD
HETEROMELES ARBUTIFOLIA	TOYON
JUGLANS CALIFORNICA	CALIFORNIA BLACK WALNUT
PLATANUS RACEMOSA	CALIFORNIA SYCAMORE
POPULUS FREMONTII	WESTERN COTTONWOOD
PRUNUS ILICIFOLIA	HOLLYLEAF CHERRY
QUERCUS AGRIFOLIA	COAST LIVE OAK
SAMBUCUS MEXICANA	ELDERBERRY

PCR

Figure 2-7
Skyline Ranch - Conceptual Site Plan

Source: LA Group, Inc., 2007.

b. Elementary School Site

An approximately 11 acre parcel of land on the site is proposed to allow for the construction of an elementary school by the Sulphur Springs School District (District). As proposed, the school site would be developed, operated, and maintained under a contemplated agreement between the District and the applicant. The school site would be located to the west of the proposed intersection of Skyline Ranch Road and Main Street (see ~~Figure 2-6~~ Figure 2-7) with a pedestrian bridge proposed across Skyline Ranch Road to provide access to the school site from residential areas to the north and east of Skyline Ranch Road. The elementary school is intended to accommodate up to 750 K-6 students. The specific design of the school facilities and ultimate location within the development area would be subject to Title 5 of the California Code of Regulations, which contains standards for school site selection, site planning, and construction of school facilities within the State of California. Once developed, plans for the school would also be subject to environmental review by the District, California Department of Toxic Substances Control, and other State and local agencies, as well as final review and approval by the Division of the State Architect.

c. Recreation Areas

An approximately 12 acre site is proposed for an improved public park in the northwestern residential portion of the site. This public park, which would be fully improved as part of the project and then dedicated to the County of Los Angeles and operated and maintained by the County Department of Parks and Recreation, is intended to serve the recreational needs of the new residential community. A conceptual park plan has been conditionally approved by the County of Los Angeles Department of Parks and Recreation. As shown on ~~Figure 2-7~~ Figure 2-8, Proposed Public Park Plan, on page ~~2-16~~ 3-17, the proposed park would include areas for active and passive recreation such as a multipurpose ballfield, a basketball court, volleyball court, children's play area, picnic areas, a community gathering area, seating and lawn areas, and a meandering pathway. The park would also include restrooms and a parking lot.

In addition to the public park, a number of smaller private parks and recreational amenities are proposed. An approximately 2.5-acre private park for passive recreation is proposed in the southern residential portion of the site along Skyline Ranch Road, and eight small pocket parks, totaling approximately 3.7 acres, are proposed within the residential development area. As shown on ~~Figure 2-8~~ Figure 2-9, Proposed Parks and Trails Locations, on page ~~2-17~~ 3-18, recreational amenities also include approximately two miles of hiking trails along the western, northern, and eastern perimeters of the development area, approximately one mile of paseos, and approximately eight miles of bike lanes. The trail along the western perimeter of the project site connects to the adjacent single family residential area. The trail along the northern perimeter includes two lookout points. The trail along the eastern perimeter also serves as fire access and connects to vacant land to the east. There are several paseos

PCR

Figure 2-8
Proposed Public Park Plan

Source: Sikand Engineering, 2009

PCR

No scale

Figure 2-9
Proposed Parks and Trails Locations

Source: Sikand Engineering, 2009

located within landscaped slope areas that provide access to the parks from residential areas. Bike lanes are proposed along Skyline Ranch Road, Main Street North, and Main Street South. All proposed trails, paseos, and bike lanes are subject to County approval.

d. Infrastructure

(1) Arterial/Collector Roadways

The project would construct a network of collector roads to provide local access to land uses associated with the proposed project. Development of the project as proposed would also provide a secondary highway improvement that would extend Whites Canyon Road to Sierra Highway. This roadway improvement would be consistent with plans shown on the County of Los Angeles Draft Highway Plan, a part of the Draft General Plan (September 2008). This Draft General Plan is currently available for public review, with final approval anticipated by ~~December 2009~~ spring 2012.[5] The existing Los Angeles County Highway Plan currently shows an extension of Whites Canyon Road being routed through the property's undeveloped area with a connection to Vasquez Canyon Road. The Plan also shows a future roadway segment for Cruzan Mesa Road between Whites Canyon Road and Sierra Highway. Issues associated with constructing these roadways as shown in the Highway Plan have been under consideration by the County due to the amount of grading that would be required and the impact the proposed alignments would have on sensitive biological resource areas. Consequently, the County is proposing a change to the Highway Plan that would realign Whites Canyon Road to connect with Sierra Highway instead of Vasquez Canyon Road with Cruzan Mesa Road eliminated as part of this change. With this proposal, no change or new access to Vasquez Canyon Road would result. The roadway improvement proposed by the project is in keeping with the County's preferred alignment and shown on the Draft Highway Plan, where Whites Canyon Road would be extended from Plum Canyon on the west (through Tract Map No. 46018) to the southeast and through the project site as Skyline Ranch Road, ultimately connecting (through property owned by the applicant in the City of Santa Clarita) to Sierra Highway just north of Adon Avenue. The realignment of Whites Canyon Road, between Plum Canyon Road and Sierra Highway, was conditionally approved as Skyline Ranch Road by the Los Angeles County Department of Public Works on July 19, 2006 under IEC P270. ~~It is expected that the extension of Whites Canyon Road/Skyline Ranch Road, will lead to an amendment to the Los Angeles County Highway Plan upon~~ Because approval of the County's Draft General Plan has been delayed, County staff requested that the Skyline Ranch project initiate the General Plan Amendment request to amend the Los Angeles County Master Plan of Highways to realign Whites Canyon Road to the proposed Skyline Ranch Road.

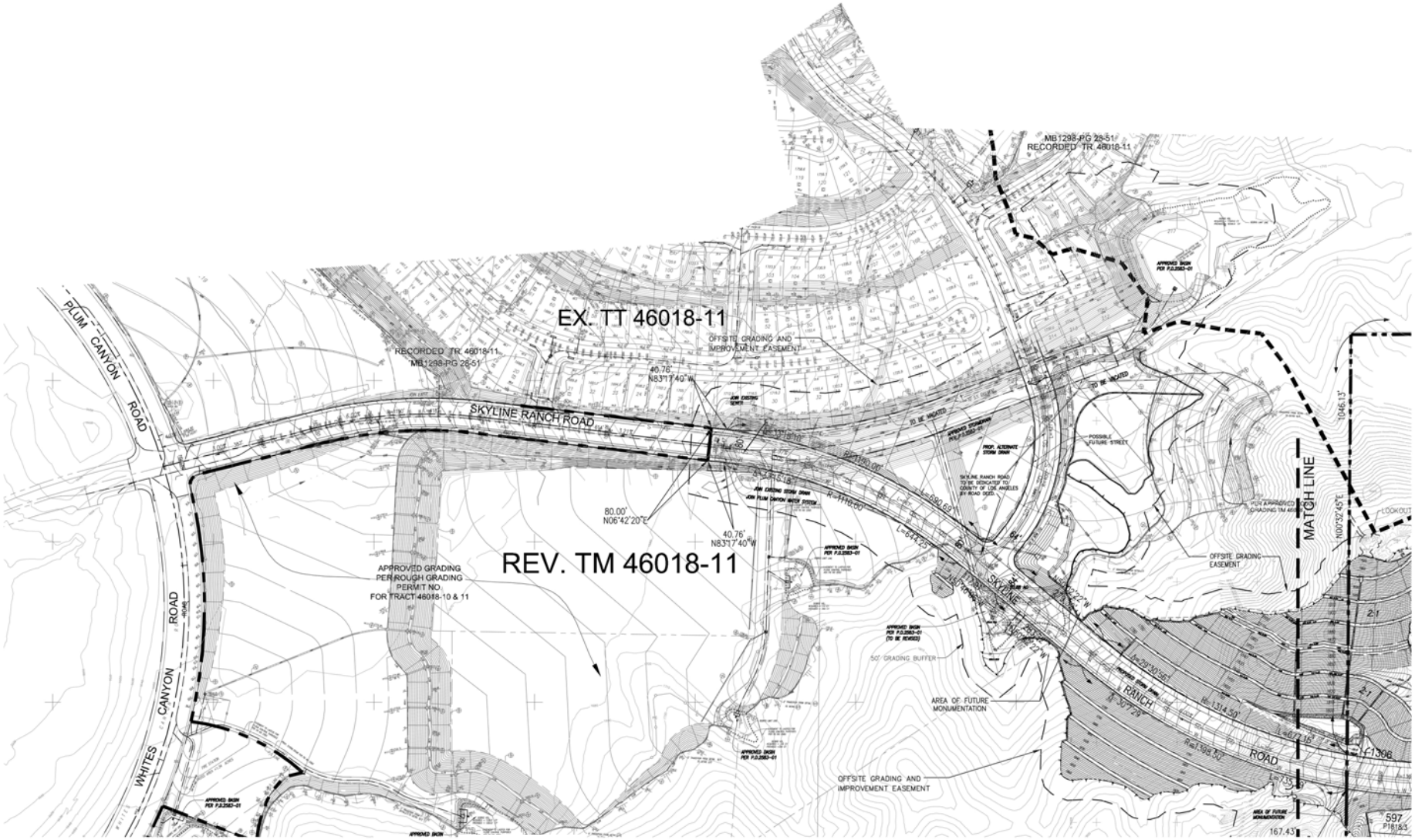
[5] *The Draft General Plan, including the Draft Highway Plan is available for public review at: http://planning.lacounty.gov/generalplan#anc-download*

Construction of Skyline Ranch Road as proposed could deny access to a portion of recorded Tract Map 46018-11 located to the west of the Skyline Ranch site, as the Tract Map was to be served by Farrell Road, as set forth in the County's Highway Plan at the time of Tract Map approval. To maintain full access to Tract Map 46018-11 with construction of Skyline Ranch Road, it is proposed that a portion of Farrell Road be vacated and a new road added to connect Skyline Ranch Road to the Tract Map, as shown on ~~Figure 2-9~~ Figure 2-10, Skyline Ranch Road Realignment, on page ~~2-19~~ 3-21. The off-site area required for grading and construction of the connecting roadway falls within areas of disturbance ~~previously evaluated for~~ associated with the development of Tracts 46018-11 and revised Tentative Tract Map 46018~~-12~~. While the off-site grading required to support the construction of the connecting roadway would be undertaken as part of the proposed project under a separate conditional use permit, in the event the uses approved under recorded Tract Map 46018-11 are not constructed first, funding and construction of the roadway would be undertaken by the applicant as part of the proposed project.[6] The construction of Skyline Ranch Road would impact 21.6 acres of a preserve area established for recorded Tract 46018. Therefore a 21.6 acre Mitigation Exchange Area would be established as part of the proposed project to ensure a preserve area is retained.

Both on- and off-site grading would be required to provide for the extension of Whites Canyon Road to the west through the development area of the site to connect with Sierra Highway to the south. Off-site grading would occur west of the development area, within Tract Map No. 46018. Approximately 535,000 cubic yards of cut and 37,000 cubic yards of fill would be required off-site to extend Whites Canyon Road to the project site. Off-site and south of the development area, within approximately 1.37 acres owned by the applicant, approximately 6,500 cubic yards of fill would be required off-site in order to provide access to the site from Sierra Highway. Overall on- and off-site grading quantities associated with the extension of Whites Canyon Road is approximately 6.4 million cubic yards (or 32 percent of all grading required for the project).

In order to provide access to the project site at Skyline Ranch Road, Sierra Highway is proposed to be widened from the existing two northbound and two southbound through lane configuration by approximately 28 feet at the project entrance and within existing right-of-way to provide one northbound left-turn lane, two northbound through lanes, two southbound through lanes, one eastbound left-turn lane, two eastbound right-turn lanes, and a traffic signal. A proposed striping plan is shown on ~~Figure 2-10~~ Figure 2-11, Sierra Highway Striping Plan, on page ~~2-21~~ 3-22. A cross-section of Sierra Highway at this location is shown on ~~Figure 2-11~~ Figure 2-12, Sierra Highway at Skyline Ranch Road Cross Section, on page ~~2-22~~ 3-23.

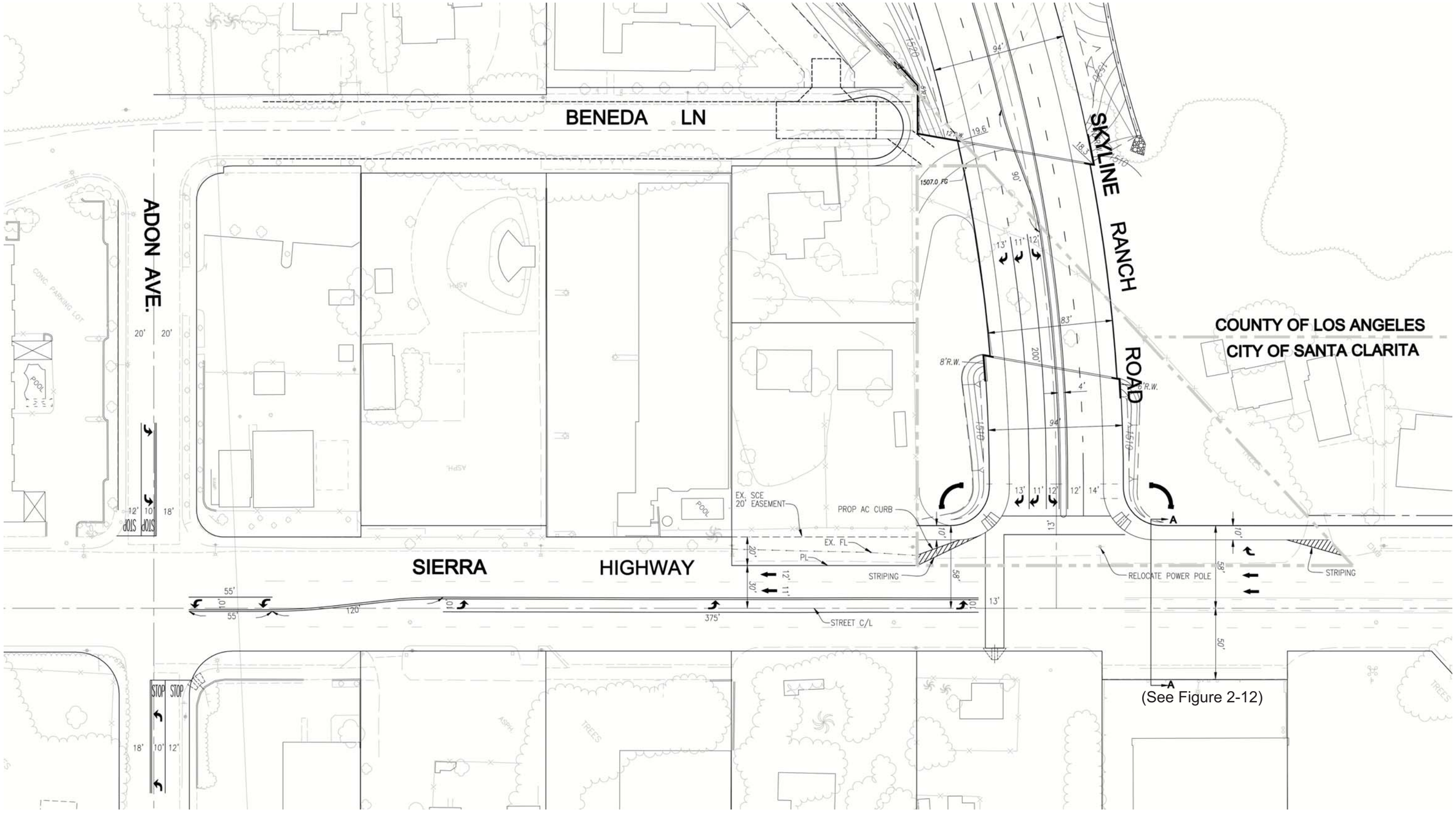
[6] *The approved tract map was evaluated in a 1988 certified Final EIR, Project No. 85-628. In the event Tract Map 46018-11 is revised, this roadway might not be necessary.*



PCR

Figure 2-10
Skyline Ranch Road Realignment (Off-Site)

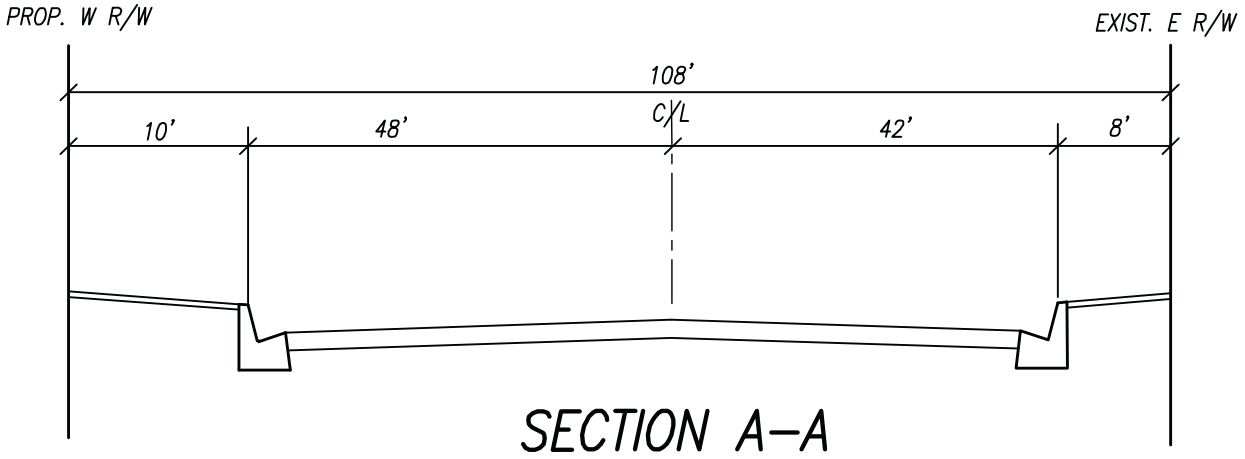
Source: Sikand Engineering, 2009



PCR

Source: Sikand Engineering, 2009

Figure 2-11
Sierra Highway Striping Plan



FUTURE 108' R.O.W. SECTION AT INTERSECTION
(See Figure 2-11)

PCR

Figure 2-12
Sierra Highway at Skyline Ranch Road Cross Section

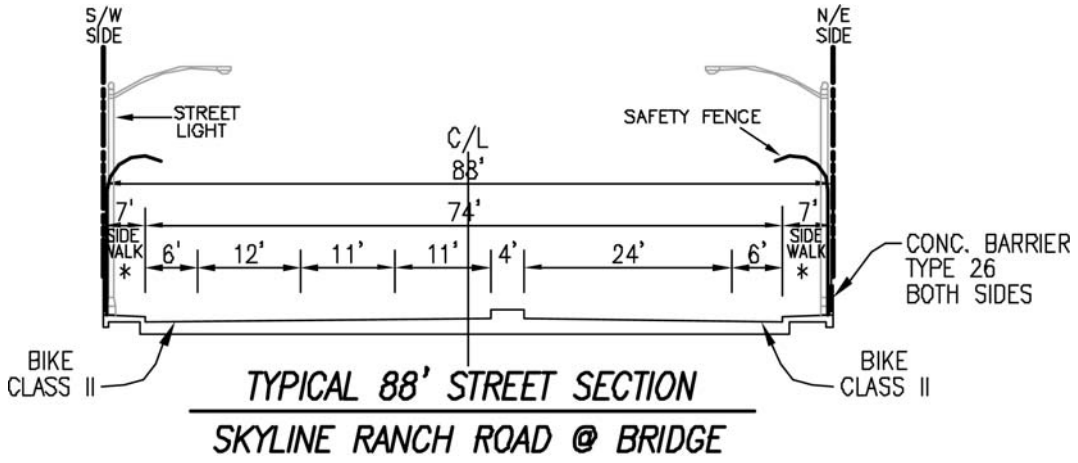
Source: Sikand Engineering, 2009

Development of the proposed entrance would include an ~~83~~88-foot right-of-way with sidewalks and a Class II bike lane at Skyline Ranch Road, as shown on ~~Figure 2-12~~ Figure 2-13 (Revised), Skyline Ranch Road Bridge Entrance Cross Section, on page ~~2-23~~ 3-25. In addition, construction of the entrance would require a cul-de-sac and hammerhead turnaround at the northeasterly terminus of Beneda Lane to provide adequate separation from Skyline Ranch Road.

As illustrated in ~~Figure 2-13~~ Figure 2-14 (Revised), ~~Conceptual Rendering of the~~ Skyline Ranch Road Cross Section, on page ~~2-24~~ 3-26, ~~Figure 2-14~~ Figure 2-15 (Revised), Conceptual Rendering the Skyline Ranch Road ~~and Interior Loop Road~~ Cross Sections, on page ~~2-25~~ 3-27, and Figure 2-16, Interior Loop Road Cross Section, on page 3-28 the extension of Whites Canyon Road through the project site is planned for two travel lanes in each direction. Through most of the site the travel lanes would be separated by a center median containing landscaped parkways of variable width within a 94-foot right-of-way. North of the public park, for approximately 100 feet, Skyline Ranch Road would narrow to an ~~80~~82-foot right-of-way with two travel lanes in each direction ~~and no center median~~. As shown on ~~Figure 2-15~~ Figure 2-17, Conceptual Rendering of Roundabout Street Cross Section, on page ~~2-28~~ 3-29, a roundabout is proposed for the intersection of Skyline Ranch Road with Main Street North and Main Street South with two-lane approaches each direction on Skyline Ranch Road and one-lane approaches each direction on Main Street. The roundabout would include an approximate 50-foot radius landscaped central island in the center and a paved median and walkway on Skyline Ranch Road. Local roadways would extend off Whites Canyon Road within a 70-, 64-, 60- or 58-foot right-of-way, as shown in Figures 2-16, ~~2-16, 2-17, and 2-18~~ 2-18, 2-19, and 2-20 on pages ~~2-29, 2-30, and 2-31~~ 3-28, 3-30, 3-31, and 3-32, respectively. All roadways within the project site would be constructed to urban or rural standards as defined by the County of Los Angeles Department of Public Works.

(2) Drainage

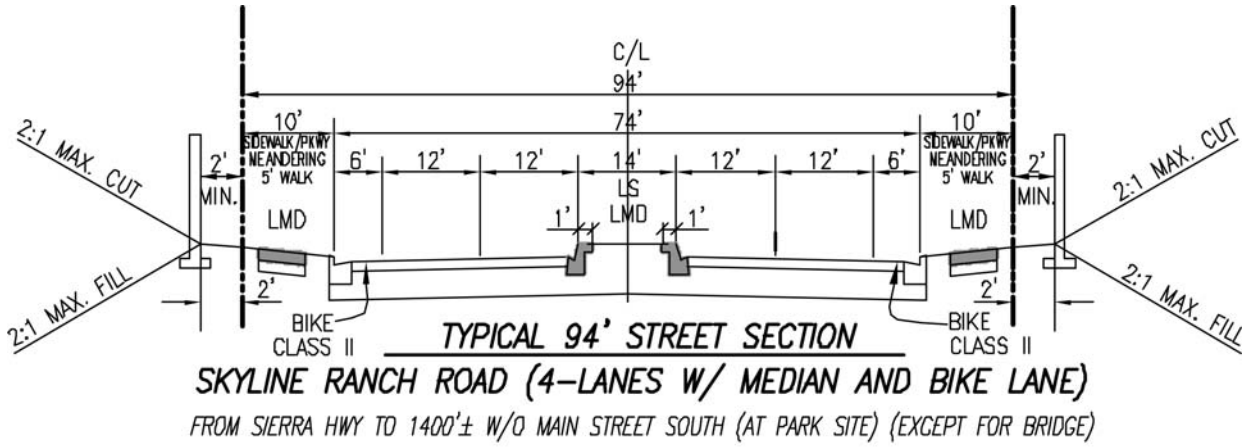
As proposed, on-site surface run-off would be intercepted by curb, debris, and/or desilting inlets and conveyed to a network of storm drains that lead to a series of treatment structures, prior to discharge into a proposed 78-inch storm drain and concrete-lined trapezoid channel that would extend approximately 3,300 linear feet, of which 1,300 feet would extend offsite to the southwest. The proposed storm drain and channel would connect with an existing County Department of Public Works flood control channel. The construction of this facility would take approximately six months and would occur during the second phase of grading. Development of the storm drain would require a flood control easement from the County Department of Public Works. In addition, an easement of approximately 800 linear feet and total area of 16,000 square feet would be required from one property owner located to the southwest. Surface water runoff from the site would also be collected by storm drains within Bookham Drive and Bakerton Avenue to the west. Energy dissipaters, such as rip rap, would be placed at the discharge points of each storm drain outlet. In addition, within and adjacent to the project



PCR

Figure 2-13 (Revised)
Skyline Ranch Road
Bridge Entrance Cross Section

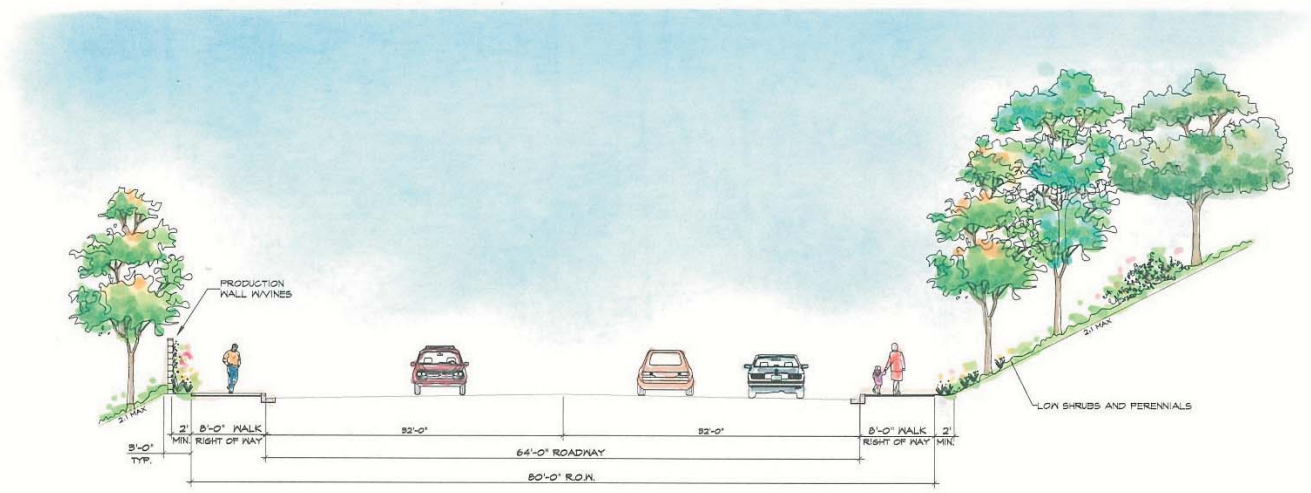
Source: Sikand Engineering, 2009



PCR

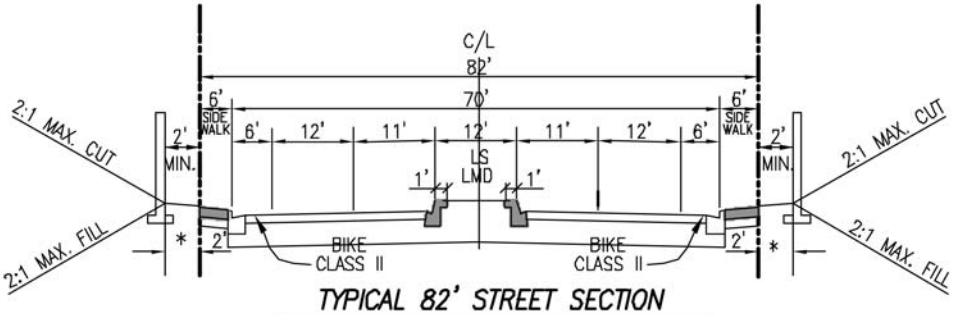
Figure 2-14 (Revised)
Skyline Ranch Road Cross Section

Source: Sikand Engineering, 2009



SKYLINE RANCH ROAD - 80' R.O.W. STREET

FROM BENSION EXTENSION TO WHITES CANYON ROAD



TYPICAL 82' STREET SECTION

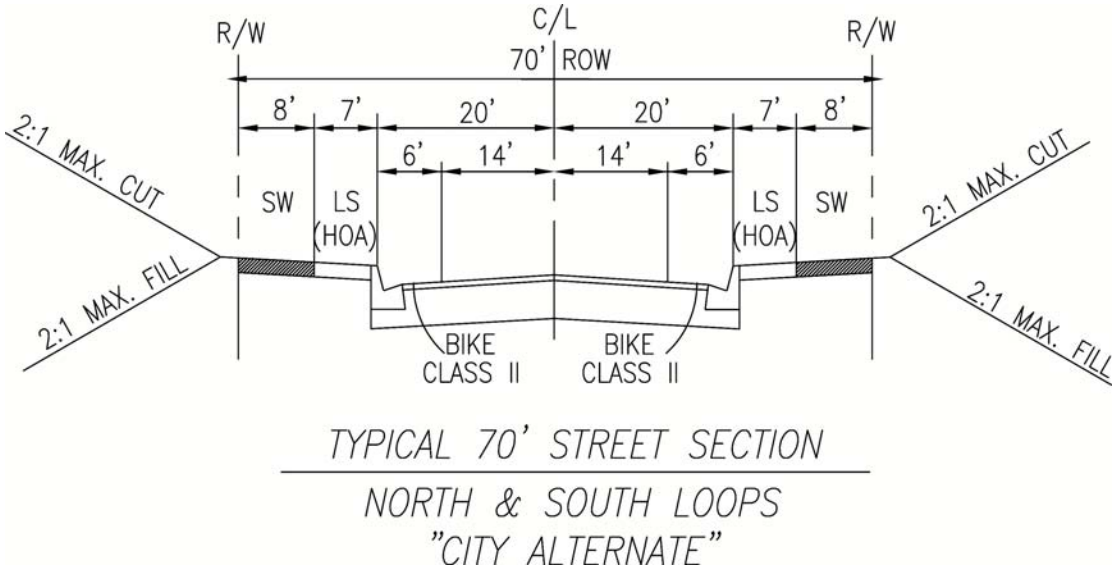
SKYLINE RANCH ROAD (4-LANES W/ MEDIAN AND BIKE LANES)

FROM 1400'± W/O MAIN STREET SOUTH (AT PARK SITE) TO BENSION EXTENSION

PCR

Figure 2-15 (Revised)
Conceptual Rendering of the Skyline Ranch Road Cross Sections

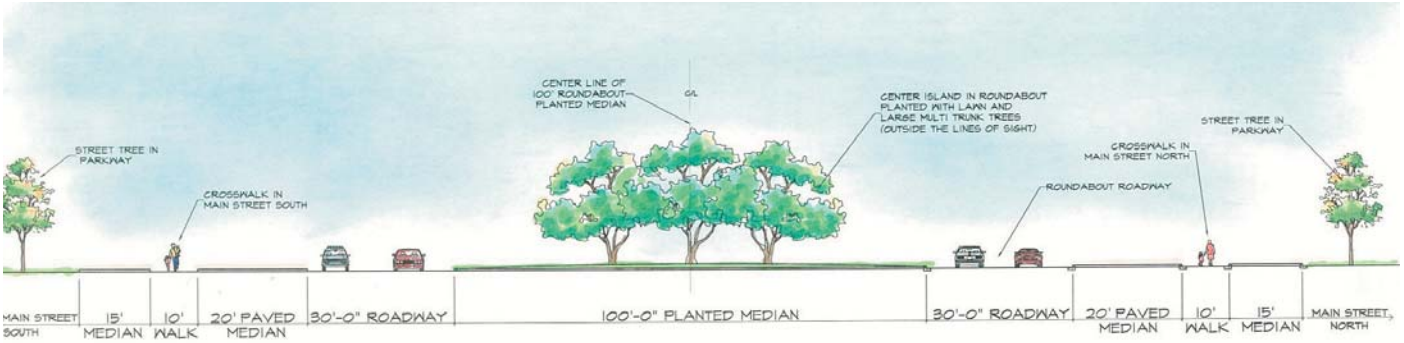
Source: L.A. Group, Inc., 2006; Sikand Engineering 2009



PCR

Figure 2-16
Interior Loop Road Cross Section

Source: Sikand Engineering, 2009



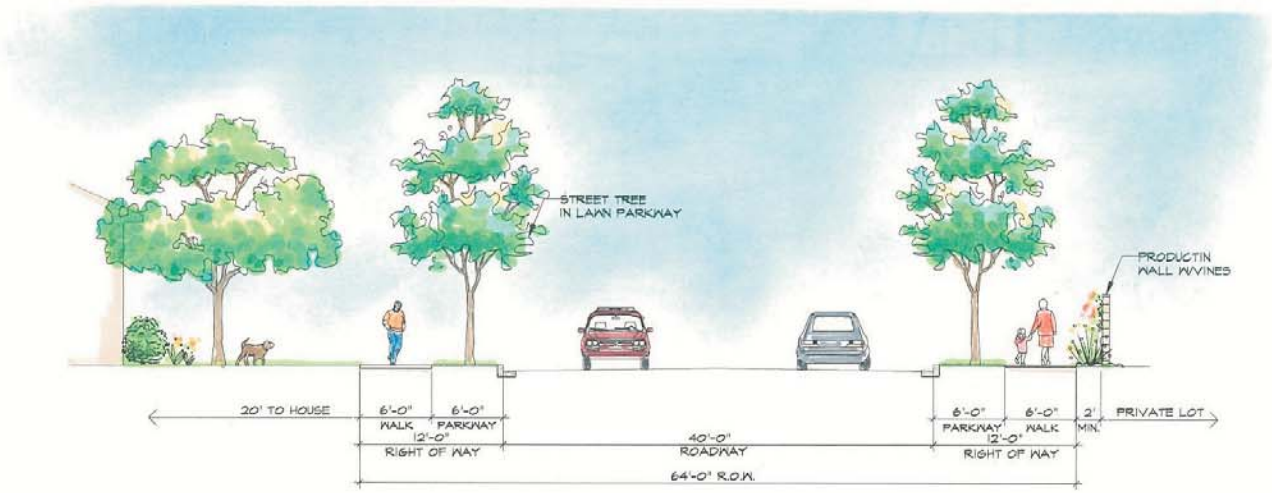
ROUNDABOUT STREET SECTION

SKYLINE RANCH ROAD AT MAIN STREET NORTH AND SOUTH

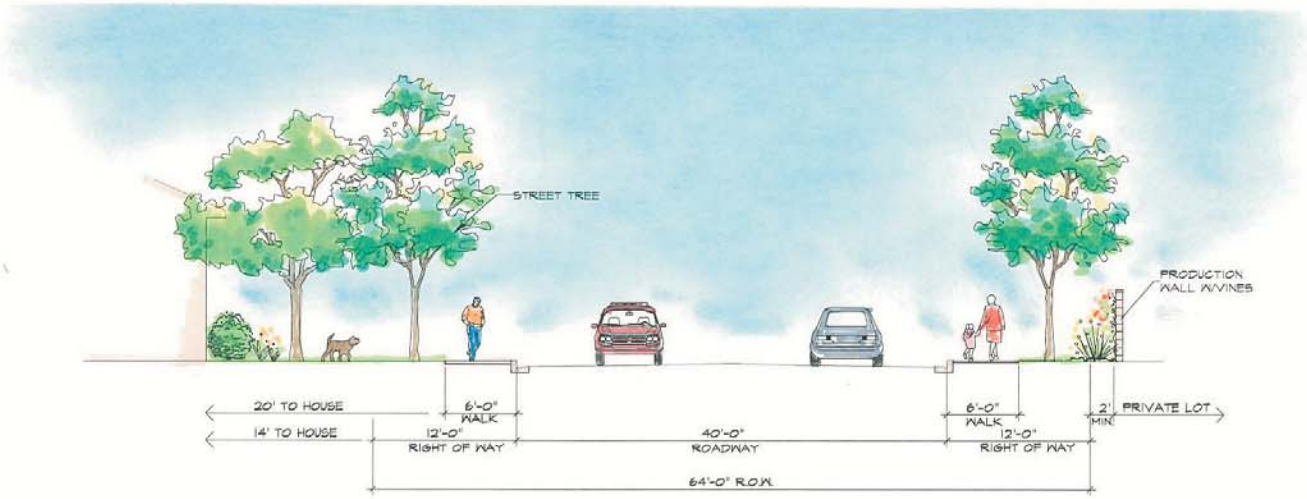
PCR

Figure 2-17
Conceptual Rendering of Roundabout Street Cross Section

Source: L.A. Group, Inc., 2006; Sikand Engineering, 2009



TYPICAL INTERIOR STREET - 64' R.O.W. LOCAL STREET

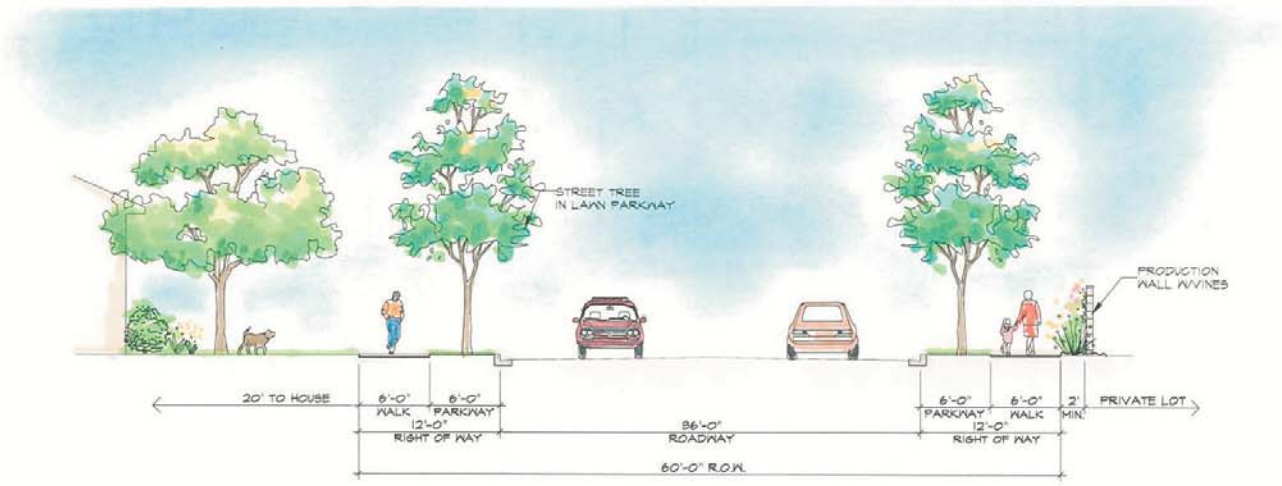


TYPICAL ALTERNATE INTERIOR STREET - 64' R.O.W. LOCAL STREET

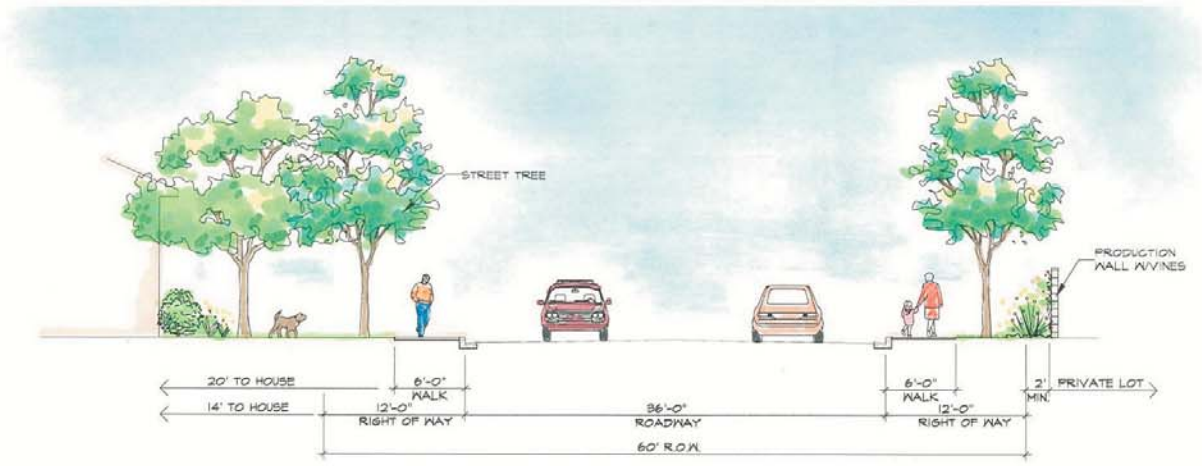
PCR

Figure 2-18
Conceptual Rendering of Interior Local Street (64' R.O.W.) Cross Sections

Source: L.A. Group, Inc., 2006



TYPICAL INTERIOR STREET - 60' R.O.W. LOCAL STREET

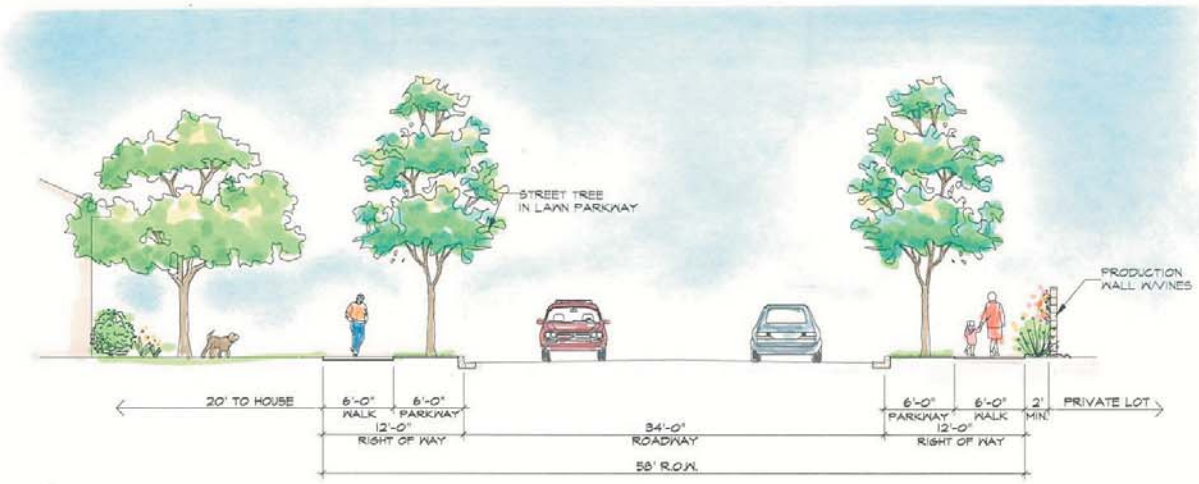


TYPICAL ALTERNATE INTERIOR STREET - 60' R.O.W. LOCAL STREET

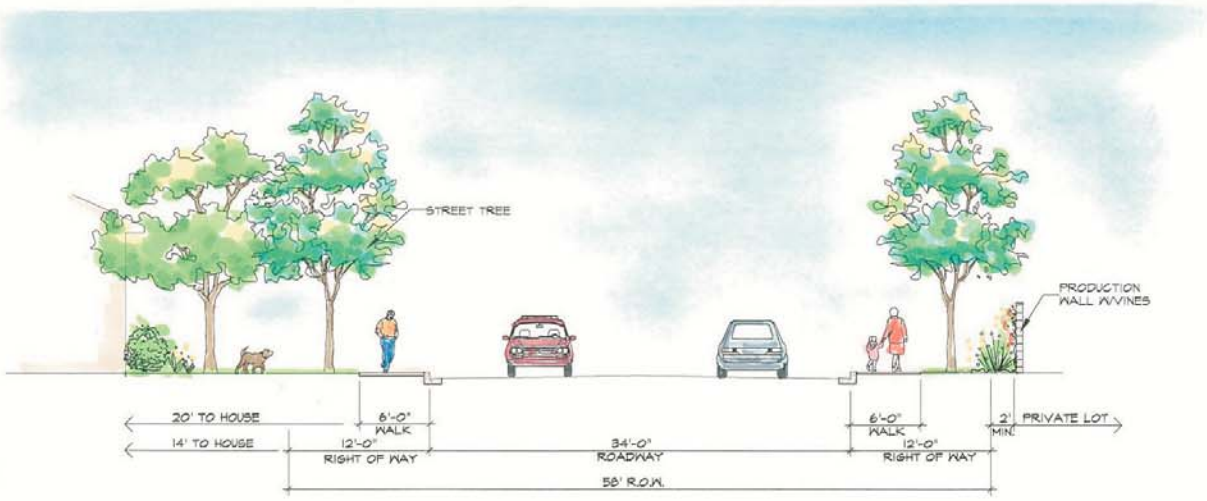
PCR

Figure 2-19
Conceptual Rendering of Interior Local Street (60' R.O.W.) Cross Sections

Source: L.A. Group, Inc., 2006



TYPICAL INTERIOR STREET - 58' R.O.W. LOCAL STREET



TYPICAL ALTERNATE INTERIOR STREET - 58' R.O.W. LOCAL STREET

PCR

Figure 2-20
Conceptual Rendering of Interior Local Street (58' R.O.W.) Cross Sections

Source: L.A. Group, Inc., 2006

site, 18 desilting basins would be constructed or rebuilt and placed to reduce downstream flow rates and debris volumes. The proposed storm drain system and the general locations of the desilting basins are included in Section 4.B, Hydrology and Water Quality, of this EIR (see Figure 4.B-3, Proposed Storm Drain and Desilting Basin Map, on page 4.B-21).

Because the proposed project entrance at Skyline Ranch Road and Sierra Highway is located within a flood zone, and in order to reduce runoff on to Sierra Highway, the proposed drainage and flood control features at the project entrance include a bridge over a series of culverts and catch basins which would allow water from Sierra Highway to flow under Skyline Ranch Road. As preliminarily designed, these features would minimize the potential for the project to contribute to downstream and upstream flooding during a 50-year storm event.

(3) Potable Water

The Santa Clarita Water Division (SCWD) of Castaic Lake Water Agency (CLWA) would provide water service to the Skyline Ranch project. SCWD water supply infrastructure is the closest to the project site and, therefore, the SCWD has the ability to more readily serve the proposed project. In 1999, CLWA purchased SCWD. After the purchase, Section 15.1 was added to the CLWA Law (Act 9099b of the California Water Code Uncodified Acts) to clarify SCWD's ability to provide retail water service. Section 15.1 authorizes SCWD to exercise retail water authority within a specified area (SCWD service area square). The SCWD service area square overlaps with portions of Newhall County Water District's (NCWD) boundaries. Within the overlap area, NCWD has the exclusive authority to provide water service, unless it consents to SCWD providing service. The project site is located within the overlap area. NCWD has consented to SCWD serving the project by entering into a Memorandum of Understanding (MOU) with CLWA on September 19, 2005. Accordingly, SCWD is authorized to serve the proposed project pursuant to Section 15.1 of CLWA Law, Water Code Section 12944.7, and the MOU.

In order to provide sufficient amounts of water and adequate water pressure to the area proposed for development, three water storage tanks and two water booster/pump stations are proposed on four lots. The water tanks would include a two-million gallon tank in the northwest portion of the developed area and two one-million gallon tanks in the northeastern portion of the developed area. All water tanks would consist of an aboveground welded steel tank supported by reinforced concrete ring footings. The tank would be designed and constructed to meet American Water Works Association (AWWA), National Sanitary Foundation (NSF) and other industry standards for domestic water storage. A total of four million gallons of storage capacity would be available to meet the emergency and fire flow storage capacity requirements necessary to support the project upon completion. The project would have two on-site water pressure zones, an 1842 zone and a 2117 zone that would each serve approximately half the development. The location of the water storage tanks, water booster stations, water pressure zones, and water

lines are included in Section 4.I, Water Resources, of this EIR (see Figure 4.I-2). Potable water would be conveyed to on-site uses via a network of 6- to 16-inch pipes that would be located primarily beneath the planned roadway alignments. The proposed system would connect to existing 8- and 10-inch pipelines located in Sierra Highway. In addition, a new 16-inch pipeline would be provided as part of the project to connect the existing SCWD Deane water tank to the on-site infrastructure via Sierra Highway.

(4) Wastewater

Wastewater generated by the proposed project would be conveyed to and treated to a tertiary level at Santa Clarita Valley Joint Sewerage System, which is operated by the County Sanitation Districts of Los Angeles County (CSD). Collection and conveyance would occur by gravity flow within a network of 8-, 10-, and 12-inch pipes placed beneath on-site roadways. The sewer collector lines serving the site would connect to an existing 21-inch City sewer within Sierra Highway. In addition, to address future development within the Mint Canyon area, the project would ultimately include the construction of a new 24-inch sewer line to supplement the existing 21-inch line in Sierra Highway. The additional line would extend approximately 3,000 feet in Sierra Highway from the CSD trunk sewer in Soledad Canyon Road to Sarabande Lane within the City of Santa Clarita. Refer to Section 4.J, Wastewater Disposal, of this EIR for a more detailed discussion of project wastewater generation, collection and treatment.

(5) Grading

Grading and associated earthwork would require the movement of approximately 20.8 million cubic yards of earth (cut/fill) on the southern 622 acres of the 2,173-acre site, with approximately 33.7 acres of grading occurring on immediately adjacent properties to the west, east, south, and southwest. Of the overall grading quantity, approximately 32 percent (or 6.4 million cubic yards) would be associated with the proposed public improvement to extend Whites Canyon Road to Sierra Highway, both on- and off-site. Within the 622-acre portion of the property, mass grading and remedial grading would take place for major roads and infrastructure, to establish drainage patterns, and to create building pads for the various land uses within the project. Mass and remedial grading would occur over an approximate 24 month period in three phases.

The overall grading and earthwork proposal includes approximately 33.7 acres of off-site grading on adjacent areas to the west, east, south, and southwest. Most of this off-site grading, 29.5 acres located west of the development area and 1.4 acres located to the south, is associated with the extension of Whites Canyon Road from Plum Canyon Road to Sierra Highway and would require approximately 535,000 cubic yards of cut and 37,000 cubic yards of fill. For approximately two acres of this off-site area, located east of the development area, a Right-Of-Way (ROW) Grant has been issued by the Bureau of Land Management (BLM) to allow for

construction of a water diversion structure and manufactured slope area after infilling on federally-owned land managed by the BLM. Approximately 65,000 cubic yards of fill, with a maximum fill depth of 100 feet, would be placed on this BLM property to support the water diversion structure and associated slope area. The construction of the off-site portion of the proposed storm drain (approximately 0.88 acres) to the southwest would require approximately 16,000 cubic yards of grading.

Grading would occur at the proposed Mint Canyon Trail trailhead entrance at Vasquez Canyon Road to provide a switch back trail of approximately 1,400 linear feet, as shown on Figure 2-4. Grading would occur within a variable width of 6-8 feet with an approximate depth of 4 feet and approximately 500 cubic yards of cut and fill to be balanced on site. Grading would occur within an area of approximately 7,405 square feet that is primarily dirt with little to no vegetation features.

A materials processing facility is proposed to be located in the northeast corner of the development area and away from existing residential areas (approximately 3,000 feet to the east and northeast and separated by major ridgelines). The facility would process approximately 68,000 cubic yards of excavated soil for use as base material for concrete and asphalt under a Conditional Use Permit. During grading, excavated materials would be stockpiled and then used as needed during construction for streets and as cover for utility trenching. The material would be excavated, sorted, then crushed or sifted, and stockpiled on site. This would reduce the need to truck in base material to the project site. Operation of the facility would commence after the first phase of grading and end prior to final phase of occupancy for an overall duration of approximately 24 months. The facility would process a maximum of 300 cubic yards per day. The materials processing facility would be located adjacent to the final phase of development and sited at a sufficient distance to minimize noise and vibration effects on adjacent residences as further described in Section 4.G, Noise.

e. Construction Phasing and Schedule

Construction of the proposed project is anticipated to occur incrementally through 2017, with completion of a first phase of construction expected in 2011. No specific time frames have been established for succeeding phases of development. The overall grading operation would begin the first quarter of 2010 and would include clearing/grubbing, sub-drain construction, erosion control, and finish grading, all of which is anticipated to take approximately 24 months with three phases. As discussed above, a total quantity of approximately 20.8 million cubic yards of earth would occur on the southern 622 acres of the 2,173-acre site and immediately adjacent properties to the west, east, and south.

Other site preparation activities include sewers, water, streets, dry utilities, entry monumentation, and landscaping/irrigation. It is preliminarily estimated that site improvements would be completed in segments after grading is complete to accommodate and serve the current phase or succeeding phase of development. Construction of storm drains, sewers, water, and streets, respectively, are expected to start in a sequential manner after site grading begins. Completion of the storm drains would coincide with conclusion of grading activities. Sewer, water and street improvements, respectively, are expected to be completed in a staggered finish after the site is graded. Construction of dry utilities and entry monumentation would start well after grading is concluded with completion expected shortly after streets are in place. The last site improvements undertaken are common area landscaping and irrigation. These improvements would generally be started after all utilities (wet and dry) are in place and functional.

2. Proposed Open Space

As further described below, roughly 1,551 acres concentrated in the northern portion of the project site is proposed to remain undeveloped. Approximately 1,355 acres of this area, representing 62 percent of the project site, would be dedicated or designated as natural open space and managed through the proposed establishment of the Skyline Ranch Conservation Area (SRCA). Approximately 166 acres of land in the northern area, referred to as the Non-Development/Continuing Use Area, would remain undeveloped. No change to currently allowed uses within this area is proposed; however, as part of the density transfer approval for the proposed project, a Declaration of Restrictions (or similar recorded land use restriction) in favor of the County of Los Angeles would be placed on use of the land to prevent commercial, residential, institutional, recreational, or industrial structures from being built in the future. In addition, approximately 21.6 acres within the northern portion of the site would be preserved as replacement habitat for 21.6 acres of preserve area within recorded Tract 46018 that would be disturbed due to the proposed construction of Skyline Ranch Road. The 21.6-acre "Mitigation Exchange Area" for the adjacent tract would be established separately from the SRCA through an agreement between the applicant, Shapell-Monteverde Partnership (owner of recorded Tract 46018), the Army Corps of Engineers, and the County of Los Angeles. The remainder of the undeveloped northern area, approximately 9 acres, would be designated as open space without conservation easements or restrictions.

A substantial portion of the area to remain undeveloped is the subject of a proposed Significant Ecological Area (proposed Cruzan Mesa Vernal Pools SEA) designation as part of the current Los Angeles County General Plan update. As further described in Section 4.C, Biological Resources, this area includes mesas, canyons, interior slopes, and a seasonally flowing wash. As proposed by the County, the Cruzan Mesa Vernal Pools SEA would encompass 958 acres within and adjacent to the northern areas of the project site. The SEA designation has been proposed by the County in large part due to the presence of two vernal pools: the Cruzan Mesa vernal pool complex and the smaller Plum Canyon vernal pool. Vernal

pools are regionally unique biotic communities that support a variety of special-status plant and animal species. The Cruzan Mesa and Plum Canyon vernal pools support the federally and state endangered California Orcutt grass, as well as the federally threatened spreading navarretia and vernal pool fairy shrimp. The vernal pools also provide potential habitat for several additional non-agency listed special status species. In addition to the vernal pools, the proposed Cruzan Mesa SEA supports coastal sage scrub and holly-leaved cherry scrub, both of which are considered sensitive/declining vegetation communities by the California Department of Fish and Game. All areas of the project site within the County's proposed Cruzan Mesa Vernal Pools SEA are proposed as open space and would fall either within the proposed SRCA, the Non-Development/Continuing Use Area, or Mitigation Exchange Area for recorded Tract 46018. The proposed SRCA and Non-Development/Continuing Use Area are described below.

The Skyline Ranch Conservation Area (SRCA)

The proposed project would, through one or more voluntary conservation easements, land dedications, or land set asides establish the SRCA, which would cover approximately 1,355 acres concentrated within the northern area of the Skyline Ranch property. The SRCA area includes habitat types such as coastal sage scrub, coastal sage chaparral scrub, chaparral, holly-leaved cherry scrub, and small areas of southern willow scrub. This area also includes the Plum Canyon vernal pool and four smaller pools on the southern portion of the Cruzan Mesa. The SRCA would be managed by an as yet undetermined agency, non-profit organization, conservation-oriented entity, or other entity approved by the County of Los Angeles with experience in the area of natural resource conservation. The SRCA would have associated with it an on-going maintenance and management program to insure the long-term persistence of the area's biotic resources. Direct and indirect degradation of habitat would be prevented in part through steep topography that separates the SRCA from the proposed development area and through the prohibition or restriction of uses within the SRCA. The SRCA would include signage where appropriate to discourage off-road vehicles, domestic pets, and other activities harmful to natural lands. Following project approval, any continued use of lands within the proposed SRCA for activities, such as film-making, would be subject to approval by the SRCA habitat manager and restricted to uses that are not incompatible with the resource conservation objectives of the SRCA. As described in Section 4.C, Biological Resources, of this EIR, conservation of these 1,355 acres would be sufficient to provide in-kind mitigation for impacts to coastal sage scrub, coastal sage-chaparral scrub, and holly-leaved cherry scrub resulting from the proposed project. The SRCA would also support the additional planting of 7.27 acres of sycamore riparian woodland within Plum Canyon.

Non-Development/Continuing Use Area

Approximately 166 acres of the northern area would remain undeveloped with restrictions placed on use of the land to prevent buildings from being established within this area.

This Non-Development/Continuing Use Area includes most of the Cruzan Mesa, including a large, bisected vernal pool and its associated watershed. As described in Section 4.C, Biological Resources, the vast majority of this 166-acre area supports non-native grasslands, disturbed areas, and disturbed coastal sage scrub. As such, this area does not provide in-kind conservation mitigation for impacts to any vegetation community that would result from the proposed project. A Declaration of Restrictions (or similar, recorded land use restriction) would be placed over the 166-acre area to prevent buildings from being established within this area. Filming and film-making activities which have historically occurred within the area may continue.

D. INTENDED USES OF THE EIR

The purpose of this Draft EIR is to assist the County of Los Angeles, as the Lead Agency under CEQA, in the decision-making process for the project. In accordance with CEQA (Public Resources Code, §21002.1), the intended uses of this Draft EIR are to identify the significant environmental impacts resulting from implementation of the proposed project, to indicate the manner in which these significant effects can be mitigated or avoided, and to identify alternatives to the proposed project. This Draft EIR is a Project EIR as defined by the *State CEQA Guidelines* (§15161).

A series of approvals, entitlements, and permits would be required for project implementation from the County of Los Angeles, City of Santa Clarita and various other public agencies. Discretionary approvals associated with the proposed project may include, but are not limited to the following:

1. County of Los Angeles

- Vesting Tentative Tract Map approval (for the development of 1260 residential lots) pursuant to Subdivision Code Subsections 21.38.010 through 21.38.080;
- General Plan Amendment to amend the Los Angeles County Master Plan of Highways to realign Whites Canyon Road to the proposed Skyline Ranch Road alignment as a secondary highway from Plum Canyon Road to Sierra Highway:
- Conditional Use Permit for work associated with offsite grading and construction of Skyline Ranch Road and temporary onsite materials processing facility;
- Conditional Use Permit for Density-Controlled Development pursuant to Zoning Code Subsection 22.56.205 and Hillside Management Areas pursuant to Zoning Code Subsection 22.56.215;

- Oak Tree Permit (for removal of one oak tree) pursuant to Zoning Code Subsections 22.56.2050 through 22.56.2260;
- Approval to construct a 70-foot non-standard right-of-way within a local interior street;
- Other approvals, subsequent to discretionary approval, including those from the following agencies:
  - County Sanitation Districts of Los Angeles County (Sewer Line Connection Permit);
  - Los Angeles County Department of Public Works (Building Permit, Grading Permit, Improvement Plan Permit, General Municipal Separate Storm Sewer System Permit, Flood Control Easement);
  - Los Angeles County Fire Department (Approval of Alternative cul-de-sac/ turnaround on Beneda Lane).

2. Other Agencies

- U.S. Army Corps of Engineers (Permit under Section 404 of the Clean Water Act for impacts to Waters of the U.S.);
- U.S. Department of Homeland Security, Federal Emergency Management Agency (Design Approval);
- U.S. Department of the Interior, Bureau of Land Management (Right-of-Way Grant);
- California Department of Fish and Game (Streambed Alteration Agreement under Section 1602 of the State Fish and Game Code for impacts to jurisdictional streambed and associated riparian habitat);
- California Department of Transportation;
- Regional Water Quality Control Board (Los Angeles Region):
  - NPDES General Construction Activity Storm Water Permit;
  - RWQCB General Municipal Separate Storm Sewer System Permit;
  - Water Quality Certification under Section 401 of the Clean Water Act for impacts to Waters of the State;
- South Coast Air Quality Management District;
- Castaic Lake Water Agency (Water Service Agreement);

- City of Santa Clarita (Encroachment Permit, Approval of Alternative cul-de-sac/ turnaround on Beneda Lane, Interim Offer of Dedication).

4.0 ENVIRONMENTAL IMPACT ANALYSIS

Section 4.A, Geotechnical Resources

Page 4.A-12, has been revised as follows:

(2) Soils

(a) Slope Stability

The project site would be graded to provide for major roads and infrastructure, establish drainage patterns and for creation of building pads for the various land uses within the project. Remedial grading in the form of buttress and stability fills would also be required for graded slopes that expose unfavorable geologic conditions or unsuitable soils. Approximately 20,800,000 cubic yards of soil would be graded within the southern 622 acres of the site, and on 33.7 acres of adjacent property to the east, west, south, and southwest. Approximately 32 percent of the grading (6.4 million cubic yards) would be associated with the proposed public improvement to extend Whites Canyon Road from Plum Canyon Road, through the site to connect with Sierra Highway.

<u>Minor grading (approximately 500 cubic yards of cut and fill to be balanced on site) would be required within the northeast portion of the project site to construct the entrance to the proposed Mint Canyon Trail at Vasquez Canyon Road. Grading would occur within a variable width of 6-8 feet with an approximate depth of 4 feet to provide a switch back trail of approximately 1,400 linear feet. The overall area of disturbance is approximately 7,405 square feet within an area that is primarily dirt with little to no vegetation features. Grading for the trail could include erosion control measures as needed, such as sandbagging, to minimize soil erosion and stormwater runoff. Due to the limited extent of grading associated with the Mint Canyon Trail entrance, impacts would be less than significant.</u>

Section 4.B, Hydrology and Water Quality

Page 4.B-11, has been revised as follows:

(2) Flood Plains

The southwest portion of Watershed A and a small portion of Watershed D ~~is~~ are within Flood Zone A as designated by the Federal Emergency Management Agency (FEMA) on the ~~Federal~~ Flood Insurance Rate Map (FIRM) panel No. ~~0607290365C~~ 06037C0840F for the communities of Los Angeles County (Community Number 065042) and Santa Clarita (Community Number 060729).[4] Flood Zone A is defined as an area subject to 100-year floods with an undetermined base flood elevation. ~~Similarly, a small portion of Watershed D is situated within a designated Zone AO. Zone AO is defined as an area subject to 100-year shallow flooding (usually sheet flow on sloping terrain) with average depth of 1 to 3 feet with an undetermined base flood elevation. The AO~~ Flood Zone A, ~~with a 2-foot depth of runoff,~~ affects Sierra Highway and areas adjacent properties southeast of the project site. These areas are subject to periodic flooding primarily as a result of large amounts of debris volume from Mint Canyon that clogs the bridge entrance near Sierra Highway and Scherzinger Lane. Two existing storm drain outlets are located north of the bridge. Watershed D is located within the County Flood Plain Boundary. The County Flood Plain Boundary is used to designate areas subject to 50-year floods, as shown on the recorded County Floodway maps. The 50-year flow rates were recently recalculated and adjusted by the County of Los Angeles, Water Resources Division, Hydrologic Development Section, as described under Methodology, below. As a result, the Calculated Existing County Flood Plain Boundary is slightly different than the ~~Existing~~ Recorded County ~~Flood Plain~~ Floodway Boundary shown on the Los Angeles County Flood Control District (LACFCD) Floodway Map

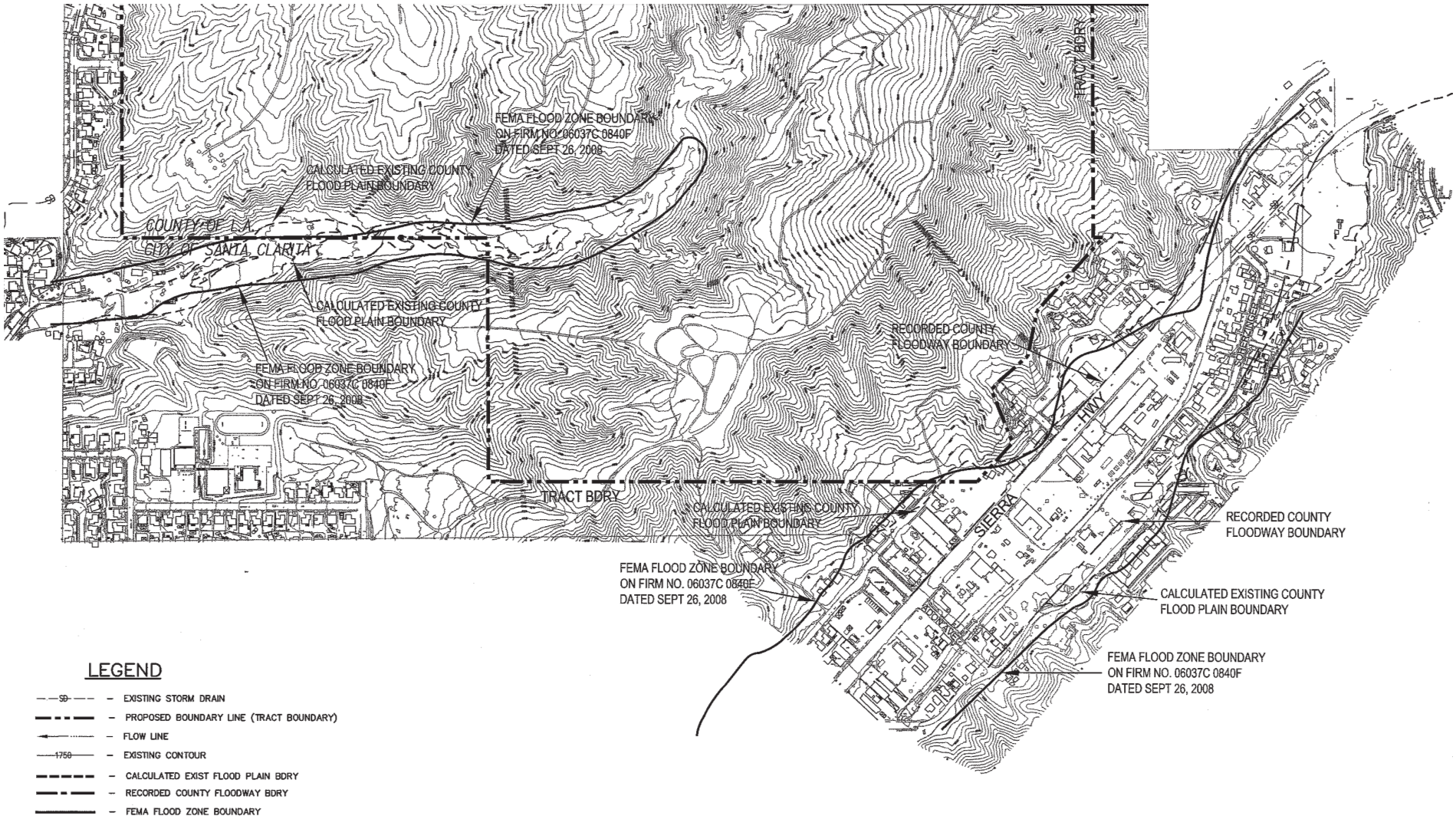
Page 4.B-13, Figure 4.B-2 (Revised), Existing County and FEMA Flood Plain Designations, has been revised to include the current FEMA FIRM reference.

Page 4.B-25 has been revised as follows:

(2) Flood Plains

As previously indicated, discharge of runoff from Watershed D currently occurs as sheet flow to Sierra Highway and adjacent properties southeast of the site near the project entrance, with a 2-foot depth of runoff in an area that is designated as a FEMA ~~AO~~ Flood Zone A, ~~subject to 100-year shallow flooding of 1 to 3 feet in depth~~ subject to 100-year floods with an undetermined base flood elevation. Construction of Skyline Ranch Road at Sierra Highway has the potential to increase flooding upstream (i.e., to the southeast of the proposed entrance) during a 50-year storm event due to the displacement of flood plain area with fill required to connect these roadways. Development of the entrance is proposed to include a bridge over a series of culverts and catch basins, which would allow water from Sierra Highway to flow under Skyline Ranch Road in order to minimize the potential for flooding at the project entrance and reduce the flow rate along Sierra Highway during a 50-year storm event. For comparison purpose, between

[4] *FEMA FIRM Panel No. ~~0607290365C, September 29, 1989~~ 06037C0840F, September 26, 2008.*



PCR

N

Not to scale

Source: Sikand Engineering, 2009

Figure 4.B-2 (Revised)
Existing County and FEMA Flood Plain Designations

the proposed drainage condition and the existing drainage condition in drainage area D and D2, there is a decrease in total flow rate of 21 cfs. However, with the construction of the proposed catch basin along Sierra Highway at the project entrance, the flow rate along Sierra Highway would be reduced by 40 cfs during a 50-year storm event, as depicted in the Flood Plain Analysis report and maps (see Appendix C-2 of this EIR). The water surface level would not rise above existing conditions during 50-year storm events. In addition, a change is proposed to the County Flood Plain Boundary as shown on Figure 4.B-5, Proposed County Flood Plain Boundary, on page 4.B-27. Construction of the proposed entrance would not encroach into the Recorded County Floodway Boundary. Although, as proposed, impacts on flooding would be less than

Page 4.B-26, Figure 4.B-5 (Revised), Proposed County Flood Plain Boundary, has been revised to include the current FEMA FIRM reference.

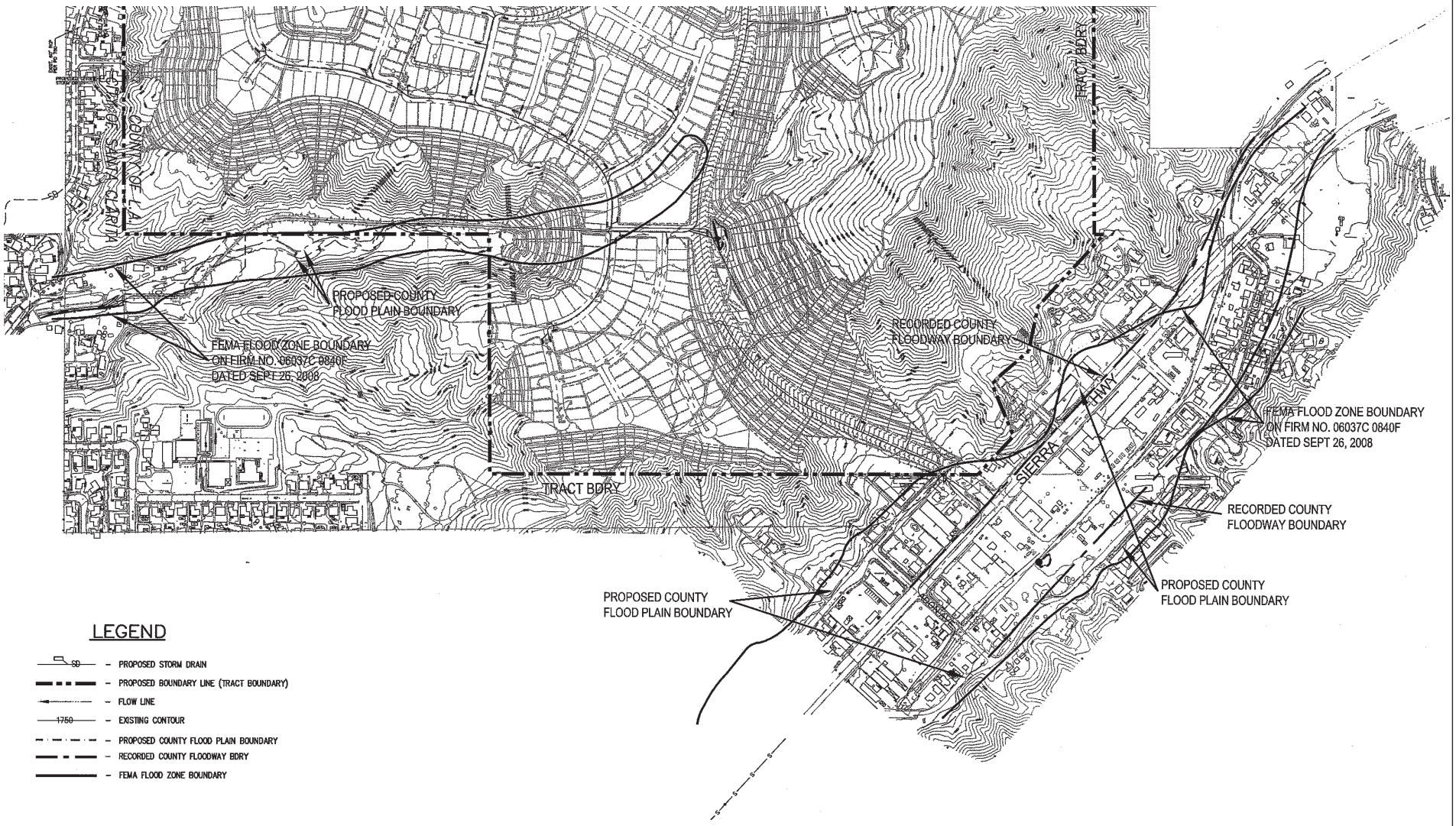
Page 4.B-33, Mitigation Measure 4.B-1 has been revised as follows:

4.B-1 *Final drainage improvement plans for the project shall ensure that there is no displacement of flood plain area in the vicinity of Sierra Highway and its intersection with proposed Skyline Ranch Road through construction of a culvert, bridge, or combination thereof, within the flood plain area. Final drainage improvement plans and the culvert or bridge shall be designed during the engineering stage by a licensed engineer to ensure that the water surface shall be equal or lower than existing conditions both downstream and upstream of the proposed project entrance along Sierra Highway and adjacent properties during a 50-year storm event and that post-development flow rates shall be less than existing conditions downstream along Sierra Highway and adjacent properties. Final drainage improvement plans to achieve these standards shall be designed to the satisfaction of, and approved by, the Los Angeles County Department of Public Works and City of Santa Clarita, Department of Public Works.*

Section 4.C, Biological Resources

Pages 4.C-2 and 4.C-3 have been revised as follows:

As further described in Chapter 2.0, Project Description, and as shown in Figure 2-3, Aerial View-Development and Conservation Areas, the Skyline Ranch project site includes an approximately 622-acre development area (grading only) in the southern portion of the study area, with nearly three quarters or approximately 1,551 acres in the northern portion of the site to remain undeveloped. Approximately 1,355 acres of the undeveloped area would be dedicated or designated and managed as natural open space through the proposed establishment of the Skyline



PCR

N

Not to Scale

Source: Sikand Engineering, 2009

Figure 4.B-5 (Revised)
Proposed County Flood Plain Boundary

Ranch Conservation Area (SRCA). A total of 166 acres on the Cruzan Mesa, the Non-Development/Continuing Use Area, would remain undeveloped with restrictions placed on use of the land to prevent buildings from being established. The remaining nine acres of undeveloped area in the northern portion of the site would be designated as open space without conservation easements or restrictions. In addition, some grading would occur in the northeast portion of the project site for the proposed Mint Canyon Trail entrance at Vasquez Canyon Road within a primarily dirt area with little to no vegetation. Approximately 60.8 acres off-site would be altered to accommodate fuel modification, remedial grading, and access roads. Collectively the project site and off-site areas are referred to herein as the study area. Much of the northern portion of the study area has been of interest to the County, and falls within the proposed Cruzan Mesa Vernal Pools Significant Ecological Area (SEA) being considered in an update to the County General Plan. All portions of the study area within the County's proposed SEA are located outside of the proposed Skyline Ranch development area and off-site areas subject to project-related grading and alteration with the exception of minor grading associated with the Mint Canyon trailhead. The SRCA and the Non-Development/Continuing Use Area are further described below under Subsection 3, Project Impacts, c. Relevant Project Features.

Page 4.C-66, third paragraph, has been revised as follows:

The proposed project would not impact southern vernal pool or southern willow scrub habitat because the project development area does not include development or grading in the northern portion of the study area where these resources occur. Grading associated with the Mint Canyon trail entrance would also not affect these resources, since grading would occur within a primarily dirt area with little to no vegetation features and approximately 3,000 feet north of the vernal pools.

Page 4.C-68, first and second paragraph, has been revised as follows:

storm drain. However, this would be restored to pre-project conditions following grading and all on-site areas will become part of the SRCA. Thus, as these impacts would be temporary and would be restored to the existing conditions after project development, impacts to jurisdictional waters off-site are considered less than significant.

Grading associated with the Mint Canyon trail entrance would have no impacts to ACOE, CDFG or RWQCB jurisdiction.

Section 4.D, Cultural and Paleontological Resources

b. Paleontological Resources

Pages 4.D-21 and 4.D-22, Mitigation Measure 4.D-2(a), 4.D-2(b), and 4.D-2(c) have been revised as follows:

4.D-2(a) *Paleontological Survey and Treatment Program. Prior to the implementation of grading or construction related activities, a qualified paleontologist shall be retained by the applicant to survey the project area to relocate known fossil localities, and determine the most sensitive areas. A qualified paleontologist is defined as a paleontologist meeting the criteria established by the Society for Vertebrate Paleontology including institutional affiliations/credentials, ability to recognize and recover vertebrate fossils in the field, local geological and biostratigraphic expertise, proficiency in identifying vertebrate fossils, publications in scientific journals. Following the survey, a paleontological resources monitoring and mitigation program will be developed by the qualified paleontologist that will include salvage of known fossil resources, areas that will be monitored during project-related earth-moving activities. The paleontological resources monitoring and mitigation program shall be submitted to the County for review and approval prior to construction grading activities. The program shall define specific procedures for construction monitoring; emergency discovery; sampling and data recovery, if needed; museum storage of any specimen and data recovered; preconstruction coordination; and reporting. Any curation costs shall be incurred by the applicant.*

4.D-2(b) *Paleontological Monitoring. The ~~paleontologist~~ paleontological monitor, who has been trained by a qualified paleontologist to identify vertebrate fossils, shall monitor earth-moving construction activities at depths determined to be sensitive as specified in the County approved monitoring plan. Monitoring will not be conducted in areas where the ground has been previously disturbed or in areas where exposed sediment will be buried, but not otherwise disturbed.*

4.D-2(c) *Paleontological Data Recovery. Prior to the start of grading or construction related activities, construction personnel involved with earth-moving activities shall be informed of procedures to follow if fossil remains are encountered. In the event that paleontological resources are encountered during construction-related earth-moving activities, all work shall cease within the immediate area and be redirected elsewhere until the paleontological monitor has evaluated the situation and provided recommendations for the protection of, or mitigation of adverse effects to, significant paleontological resources*

assessed. Upon such discoveries, the contractor shall notify the applicant and Los Angeles County. Procedures for mitigating potential impacts to significant paleontological resources shall follow the monitoring and mitigation program previously developed under this mitigation measure. Construction work within this area shall resume upon approval from the principal project ~~paleontologist~~ paleontological monitor.

Section 4.E, Visual Qualities

Page 4.E-3, Footnotes 1 and 2 have been revised as follows:

1 The County is currently updating the General Plan and has prepared a Draft General Plan (September 2008) that is available for public review at: http://planning.lacounty.gov/generalplan. An EIR that addresses the environmental impacts of the amended plan is expected to become available in the fall/winter of 2010. Adoption of the updated Countywide General Plan is estimated for spring 2012. Until this Draft Plan is approved, the existing General Plan is the current governing document.

2 The Santa Clarita Valley Area Plan, which encompasses the County of Los Angeles and the City of Santa Clarita, is currently being updated as the "One Valley One Vision," program (OVOV). ~~Drafts of the Plan Elements are currently being reviewed and public hearings on the plan are expected to occur in the later part of 2009, with adoption occurring in 2010.~~ The Draft Santa Clarita Valley Area Plan and Draft Environmental Impact Report were released for public review in September 2009. These documents are currently being revised and will be recirculated later this year. Public hearings are scheduled through 2010 with adoption anticipated to occur in late 2010 or early 2011. Until such time as this Plan is adopted, the County's existing Santa Clarita Valley Area Plan prevails.

Page 4.E-13 has been revised as follows:

As the residential lots begin to be developed on-site, the appearance of the proposed development area would change in an incremental fashion from undeveloped open space to a developed suburban area. Impacts on receptors and travelers along Sierra Highway, the only existing major public thoroughfare adjacent to the project site, would be somewhat limited as construction would primarily occur on the other side of the significant ridge along the eastern boundary of the project site. However, receptors and motorists along Sierra Highway would have a view of graded slopes on both sides of Skyline Ranch Road near the southern entrance to the project site, and of the gap in the ridgeline created for the road. Impacts on these views during construction would be significant and unavoidable until landscaping and planting have been established.

Although construction of the Mint Canyon Trail trailhead entrance at the northeast portion of the project site would be visible from Vasquez Canyon Road and nearby trails, due to the limited extent and duration of grading activities and lack of notable vegetation removal, impacts would be less than significant.

Section 4.F, Traffic/Access

Page 4.F-39, second paragraph has been revised as follows:

This alignment was conditionally approved by the Los Angeles County Department of Public Works on July 19, 2006 and is recommended as Secondary Highway (with an 80-foot standard right-of-way width and two lanes in each direction). ~~Therefore, it is anticipated that the County would amend its Highway Plan in favor of the project alignment as part of~~ Because the General Plan Update Process has been delayed, the amendment to the Los Angeles County Master Plan of Highways is proposed under this project to realign Whites Canyon Road to the proposed Skyline Ranch Road. Figure 4.F-14, Long-Range Average Daily Traffic Volumes (In Thousands) — Current County Plan and Proposed Project Alignment), on page 4.F-40 illustrates the location of these roadways according to the current Highway Plan and shows the proposed realignment and deletion, as shown on the Draft County Highway Plan for comparison.

Page 4.F-44 has been revised as follows:

(9) Pedestrian Safety

Pedestrian access routes to the proposed elementary school onsite would be provided by fully improved streets with full-width sidewalks with a pedestrian bridge across Skyline Ranch Road for residential areas north and east of Skyline Ranch Road. Pedestrians crossing Skyline Ranch Road would be able to use the pedestrian bridge, crosswalks or the traffic signal adjacent to the school at Skyline Ranch Road and Main Street South.

Because initial site access for approximately 300 units would be provided from Whites Canyon Road/Plum Canyon Road to the west, page 4.F-47, Mitigation Measure 4.F-2(b) has been revised as follows:

4.F-2(b) *Sierra Highway at Skyline Ranch Road: Prior to the issuance of the ~~first~~301st building permit the project shall construct a new intersection for project access; provide one northbound left-turn lane, two northbound through lanes, two southbound through lanes, one eastbound left-turn lane, and two eastbound right-turn lanes; and install a traffic signal. The placement of the new west leg should be of sufficient distance from the Sierra Highway centerline to allow for the eventual addition of a third southbound through lane as identified in the City of Santa Clarita General Plan Circulation Element.*

Section 4.G, Noise

Page 4.G-22 has been revised as follows:

c. Impact Analysis

A total of 1,260 residential dwelling units, an approximately 11 acre elementary school site, approximately 12 acres of public parkland, approximately 6 acres of private parkland, supporting roadways (including the proposed Whites Canyon Road extension to Sierra Highway), and infrastructure improvements are proposed on 622 acres in the southern portion of the 2,173-acre Skyline Ranch site. The remaining 1,551 acres in the northern portion of the site would remain undeveloped. The 622-acre development area would be graded, with grading and building construction activities occurring as close as 25 feet from the existing residential subdivisions to the west. Grading would also occur along the southernmost property line, which abuts large lot single-family residences and multi-family residences north of Beneda Lane and Stonehill Way. The project site also abuts residences along Hillfield Lane and Sierra Cross Avenue west of Sierra Highway, however, no grading or construction is proposed in close proximity to these residences. Grading would occur at the northeast portion of the project site for the proposed Mint Canyon Trail trailhead entrance. There are also offsite construction activities associated with the utility and road improvements planned for Foxlane Drive, Canyon Crest, Bookham Drive, Bakerton Avenue, and Goodvale Road near west and southwest portion of the project boundary; and within Beneda Lane and Sierra Highway, near the project entrance.

(1) Construction Noise Impacts

(a) Background

Project development activities would primarily include site preparation (grading and excavation) and construction of internal roadways and other infrastructure, driveways, and structures. The project applicant proposes to develop approximately 622 acres of the site with 1,260 single-family residential lots along with an approximately 11-acre elementary school site, approximately 12 acres of public parkland, and approximately 6 acres of private parkland. Off-site construction activities would occur on approximately 29.5 acres for the extension of Whites Canyon Road/Plum Canyon Road from the northwest to the project site and associated drainage basins, approximately 2 acres for landscaped slope area to the east, and approximately 1.4 acres for the extension of Skyline Ranch Road to Sierra Highway to the south. Grading would occur at the northeast portion of the project site for construction of the proposed Mint Canyon Trail trailhead entrance at Vasquez Canyon Road to provide a switchback trail of approximately 1,400 linear feet. Offsite construction would also include cul-de-sac/hammerhead turnaround improvements at Canyon Crest, Beneda Lane, and Bookham Drive; a 78-inch storm drain and

trapezoid channel that extends to the southwest near Goodvale Road and proposed storm drains within Bookham Drive and Bakerton Avenue; and downsizing an existing debris basin at the easterly terminus of Foxlane Drive. In addition, the project would include a sewer line and water line within Sierra Highway. Construction of the off-site portion of the 78-inch (approximately 0.88 acres) would extend approximately 1,300 feet to the southwest and require approximately

Page 4.G-29 has been revised as follows:

The construction of 78-inch storm drain and concrete-lined trapezoid channel installation would also use open-cut trenching techniques. Construction noise levels would be expected up to 86 dBA at the noise sensitive receptors within 50 feet near Goodvale Road. Construction noise from the storm drain and concrete-lined trapezoid channel installation would be considered a temporary significant impact. The estimated 86 dBA noise level represents the worst-case condition when heavy construction equipment would be operating near Goodvale Road. A materials processing facility would be located in the northeast corner of the development area. The facility would process approximately 68,000 cubic yards of excavated soil for use as base material for concrete and asphalt. The nearest noise-sensitive uses, single-family residential uses, are located approximately 3,000 feet to the east and northeast of the Materials processing facility site and separated by major ridgelines. The grading activity related noise level of 86 dBA at a reference distance of 50 feet would be up to 51 dBA at the single-family residential uses. As the grading related noise would not exceed 60 dBA threshold of significant, impacts would be less than significant.

Although noise from grading activities associated with the construction of the Mint Canyon Trail entrance may be audible from users of the nearby trails, in general, noise sensitive uses are not located near proposed trail entrance. Therefore, due to the distance from noise sensitive receptors, the short duration of construction activity, and intervening topography and roadway noise, impacts from grading activities would be less than significant.

Section 4.H, Air Quality

Page 4.H-22 has been revised as follows:

The entire project construction duration is estimated to be seven years with site preparation and grading commencing in 2010 and building construction completed in 2017. It is assumed that site preparation would be performed in a single phase. Site preparation would consist of approximately 20.8 million cubic yards of earthwork which would occur on the southern 622 acres of the 2,173-acre site and on adjacent properties to the west and south for project access, and to the east for landscaped slopes. The cut/fill from this earthwork would be balanced at the project site and there would be no soil import or export. A portable material

processing facility (rock crushing) is expected to be operated during the site preparation phase. Use of an on-site material processing facility would reduce the truck trips necessary for importing concrete and asphalt base. Emissions from the material processing facility are included in the overall project analysis. Details are presented in Appendix H.

Although site preparation and grading are expected to occur during a single phase, certain areas may be ready for building construction before the entire site is graded. It is assumed that building construction could occur in some areas while site grading is underway in other areas of the site. In order to represent a worse case analysis, it was assumed that site grading and several building construction phases would be occurring simultaneously (overlapping).

Construction activities would also include the trailhead entrance to the Mint Canyon Trail at the northeast corner of the project site off of Vasquez Canyon Road. The proposed trail extension would include a 1,400 linear feet switchback trail. Grading for this portion of the trail would occur within a variable width of 6-8 feet with an approximate depth of 4 feet and approximately 500 cubic yards cut and fill to be balanced on site. Due to the distance of grading activities from sensitive receptors and the short duration of construction, impacts on air quality from construction of the trail entrance would be less than significant.

Section 4.I, Water Resources

Page 4.I-6, Figure 4.I-2 (Revised), Conceptual Water Plan, has been revised to show the new locations of the alternative booster station and booster station.

Section 4.K, Solid Waste Disposal

Page 4.K-5, Table 4.K-1, Footnotes g and h have been revised as follows:

[g] *Limited to Scholl Canyon ~~Watershed~~Wasteshed as defined by City Ordinance ~~#4782~~#4780.*
[h] *Limited to the Calabasas ~~Watershed~~Wasteshed as identified by Los Angeles County Ordinance #91-0003.*

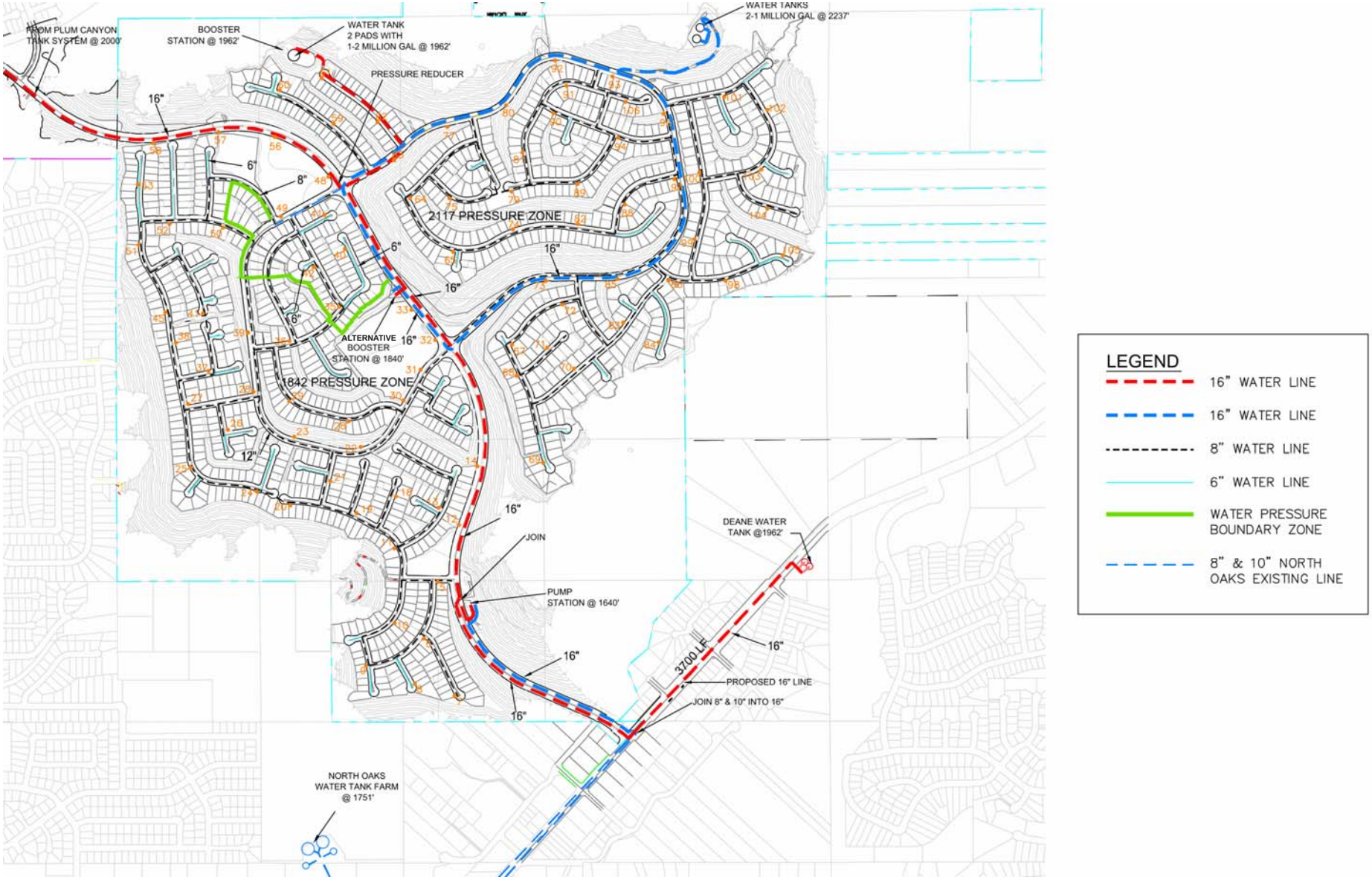
Section 4.M, Fire Services and Hazards

Pages 4.M-3 and 4.M-5 have been revised as follows:

b. Environmental Setting

(1) Fire Protection Services/Facilities

The Los Angeles County Fire Department (LACoFD) provides fire protection services to the unincorporated areas of the County and 58 cities, as part of the Consolidated Fire Protection



Scale in approximate feet
Source: Sikand Engineering, 2008.

PCR

Figure 4.I-2 (Revised)
Conceptual Water Plan

District. In addition to fire protection services, the LACoFD also provides special operations services including fire prevention, hazardous materials, emergency medical services, lifeguards, forestry, urban search and rescue, and terrorism response. As of 2007, LACoFD had a staff of approximately 4,767 persons, which include captains, firefighters, firefighter paramedics, administrative personnel, and others. The LACoFD's service area covers 2,305 square miles and approximately1,215,921 households. With 21 battalions, 163 fire stations, and 263 engine companies (22 in training) in 9 geographical divisions, the LACoFD serves over 4.1 million residents.[4]

The project site is located within Battalion 6 of the LACoFD's District, which includes the unincorporated areas of the Santa Clarita Valley and the City of Santa Clarita. As shown in Figure 4.M-1, Existing and Proposed Fire Stations in the Project Vicinity, on page 4.M-4, within the project vicinity, there are 12 existing and 13 proposed fire stations. The LACoFD is not divided into distinct service areas. The closest available units are dispatched as needed to an emergency incident anywhere within its territory.

The closest fire station to the project site is Fire Station 107, located at 18239 West Soledad Canyon, Canyon Country, approximately 1 mile south of the site. This station currently provides the primary response for the project site during emergency incidents. Fire Station 107 is staffed with a 3-person engine company and 2 firefighter paramedics. The second closest fire station is Fire Station ~~104~~ 132, ~~temporarily~~ located at ~~26201 Golden Valley~~ 29310 Sand Canyon Road in the City of Santa Clarita, approximately ~~2.5~~ 2 miles ~~southwest~~ east of the site. This station currently houses a 4- person ~~quint (a combination engine/ladder truck apparatus)~~ engine company. ~~The permanent location for Fire Station 104 will be at 26901 Golden Valley Road (at the intersection of Soledad Canyon Road), but a timeframe has not been established.~~ Additionally, the LACoFD has indicated that Fire Station 128 to be located at 28450 Whites Canyon Road, is planned to be operational by the end of 2010.[5] Once constructed and operational, this new station would be located approximately 0.75 mile from the site, and is expected to replace Fire Station 107 as the primary responder for the project site.

The LACoFD strives to maintain a minimum first-due response distance for a new project based on the project's density. Since the critical factor for fire containment is structure

[4] *2007 Statistical Summary, Los Angeles County Fire Department available online at: http://www.fire.lacounty.gov/PDFs/StatSummary.pdf accessed May 18, 2009; Updated information provided via email correspondence by Lorraine Buck, Supervising Planning Analyst, Los Angeles County Fire Department, May 27, 2009.*

[5] *Telephone communication with Debbi Aguirre, Planning Division, Los Angeles County Fire Department, January 14, 2005 and Danny Kolker, Planning Division, Los Angeles County Fire Department, April 9, 2007. Updated information provided by Lorraine Buck, Supervising Planning Analyst, Los Angeles County Fire Department, via email correspondence May 27, 2009 and Frank Vidales, Acting Chief, Forestry Division, Los Angeles County Fire Department, letter dated October 22, 2009.*

separation, the project's relevant density is the density within the developed area, after subtracting open space. The actual density for the proposed project is considered low-urban/ suburban. Therefore, according to the LACoFD, the minimum response distance for the project is three miles from the closest fire station.[6]

In 2008, Fire Station 107 responded to a total of 2,926 incidents. Of these, 58 were fire-related incidents, 2,362 emergency medical incidents, and 506 miscellaneous incidents (e.g., false alarms, hazardous conditions, unspecified, etc.). Fire Station ~~104, from its temporary location,~~ 132 responded to a total of ~~412~~704 incidents in 2008. Of these total incidents, ~~14~~44 were fire-related incidents, ~~2878~~502 were emergency medical incidents, and ~~120~~158 miscellaneous incidents).[7] The LACoFD has indicated that their first-due response time targets in low-urban/suburban areas is 6 minutes for basic life support incidents requiring the dispatch of an engine company and 10 minutes for advanced life support incident requiring the dispatch of paramedic units.[8]

Funding for LACoFD staffing is provided primarily through property taxes and ~~. Also,~~ a ~~special~~ voter-approved special tax passed in 1997. ~~and the~~ The LACoFD Developer Fee Program, described above, ~~contributes financial resources~~ generates funding for land acquisition, ~~facility improvements~~ development of new facilities, and ~~partial funding of~~ equipment. The LACoFD has indicated that additional manpower, equipment, and facilities are needed in the project area.[9] However, limited tax revenues have restricted the LACoFD's ability to meet new growth needs. While general plans have been developed for

Pages 4.M-8 and 4.M-9 have been revised as follows:

As described above, the project would be required to pay fees pursuant to the Los Angeles County Fire Department's Developer Fee Program, which would be used toward land acquisitions, ~~facility improvements~~ new facilities, and ~~partial funding of new~~ equipment. The Developer Fees are adjusted annually to ensure that adequate levels of fire protection service are

---

[6] *Telephone communication, Danny Kolker, Los Angeles County Fire Department, January 14, 2005.*

[7] *Telephone communication with Debbi Aguirre, Planning Division, Los Angeles County Fire Department, January 14, 2005 and Danny Kolker, Planning Division, Los Angeles County Fire Department, April 9, 2007. Updated information provided by Lorraine Buck, Supervising Planning Analyst, Los Angeles County Fire Department, via email correspondence May 27, 2009 and Frank Vidales, Acting Chief, Forestry Division, Los Angeles County Fire Department, letter dated October 22, 2009.*

[8] *Op.Cit., Danny Kolker, January 14, 2005 and Frank Vidales, Acting Chief, Forestry Division, Los Angeles County Fire Department, letter dated October 22, 2009.*

[9] *Written correspondence, David Leineger, Forestry Division, Los Angeles County Fire Department, October 8, 2004; ~~and~~ telephone communication with Danny Kolker, Op. Cit., April 9, 2007; and Frank Vidales, Acting Chief, Forestry Division, Los Angeles County Fire Department, letter dated October 22, 2009.*

maintained. It is expected that these fees would be sufficient to off-set project demand on LACoFD services. Importantly, the Developer Fee Program has helped fund improvements in the area that would serve the project site, particularly future Fire Station 128, to be located at 28450 Whites Canyon Road, approximately 0.72 mile from the site. This station is planned to be operational by 2010. Additionally, once residential units are occupied, the project would generate annually recurring revenue ~~to the County's General Fund in the form of taxes and other miscellaneous charges (e.g., sales tax, property tax, utility users tax, library fees, etc.)~~ in the form of property taxes. A portion of such revenue would be used to address costs associated with demand for LACoFD operations and staffing. ~~The allocation of revenue to a specific municipal service is determined through the County's budgeting process by the County Board of Supervisors.~~ While ~~general fund~~ these revenues have historically supported adequate levels of fire protection services in the area, if sufficient funding for LACoFD services is not maintained by the County, a potentially significant impact could occur.

Section 4.P, Parks

Pages 4.P-11 and 4.P-12 have been revised as follows:

c. Impact Analysis

As described in Chapter 2.0, Project Description, the project would provide approximately 18 acres of public and private park space, which include a 12-acre public neighborhood park, a 2.5-acre private park, and eight pocket parks totaling approximately 3.7 acres. The proposed public park would be fully improved and provide ~~10.6~~ 9.2 acres of parkland dedicated to the LADPR. As shown on Figure 2-7, Proposed Park Plan, the public park would include the following features: a community gathering area and shade structure; a children's play area with parents' seat wall; picnic tables; grass volleyball area; open lawn area; basketball court; ballfield with bleachers; multi-use ballfield; a comfort station with restrooms, a drinking fountain, and storage room; and parking for 20 cars. In addition, security lighting, trash enclosures, and locking gates would also be provided.[11] The neighborhood park and pocket parks would be maintained by a homeowners' association. Other proposed recreational amenities within the development area, as depicted on Figure 2-8, include approximately two miles of hiking trails along the western, northern, and eastern perimeters of the development area, approximately one mile of paseos, and approximately eight miles of bike lanes located along Skyline Ranch Road, Main Street North and Main Street South. The undeveloped northern portion of the site would also include a trail easement of approximately ~~2.2~~2.5 miles that would connect to the Mint Canyon Trail to the north and the existing Plum Canyon fire road to the

[11] *Written correspondence, James Barber, Section Head, Land Acquisition/Developer Obligations, County of Los Angeles Department of Parks and Recreation, October 20, 2008.*

south, and southwesterly towards a lookout point. A portion of the Mint Canyon Trail off of Vasquez Canon Road would be graded to provide a switch back trail of approximately 1,400 linear feet. The location of the public park and trail easement are shown on Figure 4.P-1.

As indicated above, LACC requires that new subdivisions dedicate on-site parkland, development improvements, and/or the payment of in-lieu fees to meet the recreational demands of its residents. The project proposes the development of 1,260 single-family detached dwelling units. As indicated by the LADPR, based on the LACC park requirement formula, the proposed project is required to provide 12.23 net acres of on-site park space that meets LADPR criteria.[12] The proposed project would provide approximately 18 acres of parkland, including a fully improved ~~10.6~~ 9.2-acre public park as described above. Because the ~~10.6~~ 9.2 acres of public park space is less than the 12.23 acres required by LADPR, payment of in-lieu fees would also be required. However, because the total park development costs exceed the in-lieu fee requirements, these costs will be credited against and eliminate payment of in-lieu fees. With the ~~payment of fees and~~ development and conveyance of a fully improved park to LADPR, impacts related to the provision of parks and recreational facilities would be less than significant. Although not credited under LACC park requirement formulas, it should also be noted that the project would also provide approximately two miles of hiking trails, one mile of paseos, approximately eight miles of bike lanes, and ~~2.2~~ 2.5 miles of trail easement associated with the Mint Canyon Trail.

Pages 4.P-13 and 4.P-14 have been revised as follows:

As discussed above, the Santa Clarita Valley faces no shortage of regional park space. The Subregion Area currently has a ratio of 21.9 acres of regional park space per 1,000 residents, which exceeds the standard of 6 acres per 1,000 residents. Thus, the existing supply of regional park space would be sufficient to accommodate the project's 4,158 new residents. Based on the above, impacts on regional parks are considered less than significant.

The proposed trail alignment in the northeastern portion of the site was developed based on consultation with the ~~LADPR~~ LADPR and adjusted for site topography and other site conditions. As depicted on the Santa Clarita Valley Area Plan Trails Map, the trail would connect with the existing Mint Canyon Trail and extend south towards the Plum Canyon Fire Road. In addition, a portion of the trail would extend west and south and terminate at a lookout point for a total trail easement length of approximately ~~2.2~~ 2.5 miles. This proposed alignment is shown on ~~Figure 2-3, Aerial View – Development and Conservation Area, on page 2-7~~ Figure 2-4, Mint Canyon Trail Entrance on page 2-8. The proposed trail would require the dedication of

[12] *Written correspondence, James Barber, Section Head, Land Acquisition/Developer Obligations, County of Los Angeles Department of Parks and Recreation, October 20, 2008. The entire parkland obligation and in-lieu fees, as determined for 1,270 units, would be provided as a condition of project approval for the 1,260 units now proposed.*

a variable width trail easement for the Mint Canyon Trail to the satisfaction of the LADPR and National Forest Service. As discussed previously, approximately 1,400 linear feet of the Mint Canyon Trail entrance would be developed in the northeastern portion of the site to provide a switch back trail. Beyond the provision of this beneficial trail improvement to facilitate the extension of the existing Mint Canyon Trail to the project site, the proposed project would not conflict with or have an impact on the trail as it is located in an area of the site that will remain as open space and is remote from the development area. As analyzed in Section 4.E, Visual Qualities, there would be no impacts on views from existing and proposed trails north, northeast, and northwest of the project site, or on views from the proposed trail, since areas proposed for development are not visible from the north due to a major intervening ridgeline. Although construction of the Mint Canyon Trail trailhead entrance at the northeast portion of the project site would be visible from Vasquez Canyon Road and nearby trails, due to the limited extent and duration of grading activities and lack of notable vegetation removal, impacts would be less than significant.

4. MITIGATION MEASURES

No mitigation measures would be necessary as the project would not result in significant impacts on parks and recreational facilities.

5. CUMULATIVE PROJECT IMPACTS

The analysis of cumulative project impacts on parks and recreational facilities is based on population projections as analyzed in Section 4.R, Population, Housing and Employment, of this EIR. The geographic area for cumulative impacts on local recreational space is the Santa Clarita Valley, and the geographic area for cumulative impacts on regional recreation space is the project's Subregional Area. Based on the analysis in Section 4.R, Population, Housing and Employment, the 2017 population for the project's unincorporated Santa Clarita Valley is projected to be 309,418 persons and the 2017 population for the project's Subregion Area is projected to be 887,968 persons. This forecasted growth will increase the demand for local and regional park space.

As discussed above, in accordance with the Los Angeles County Code, the project would provide approximately ~~10.6~~ 9.2 acres of fully-improve public park space ~~and in-lieu fees~~ to meet the recreational demands of its residents within the park planning area, as determined by LADPR. Similarly, any new residential projects would be subject to the same park space requirements. Therefore, it is anticipated that the future demand for local parks would be accommodated by privately-funded park space (via compliance with the LACC park requirements), and the project would not result in a cumulative impact on local park space.

Existing regional park space is sufficient to accommodate the projected 2017 population of the project's Subregion Area. Assuming that there will be no increases in the acreage of regional park space, there will be 15.1 acres of regional park space per 1,000 residents in 2017, which would still exceed the County's standard for regional park space within the Subregion Area. Furthermore, beyond meeting local park land requirements, the proposed project would provide approximately two miles of hiking trails, eight miles of bike lanes, ~~2.2~~ 2.5 miles of trail easement associated with the Mint Canyon Trail, along with dedication of approximately 1,355 acres of open space for the Skyline Ranch Conservation Area which is expected to have some allowance for public access. Thus, given that the project fully mitigates its impacts and would not have a cumulatively considerable effect on demand for parkland, no cumulative impacts on regional park space would occur in combination with other projects identified in Chapter 3.0, Cumulative Impact Analysis Methodology.

Section 4.Q, Land Use

Page 4.Q-3, Footnote 2 has been revised as follows:

[2] *The County is currently updating the General Plan and has prepared a Draft General Plan (September 2008) that is available for public review at: http://planning.lacounty.gov/generalplan. An EIR that addresses the environmental impacts of the amended plan is expected to become available in the fall/winter of ~~2009~~ 2010. Adoption of the updated Countywide General Plan is estimated for ~~2010~~ spring 2012. Until this Draft Plan is approved, the existing General Plan is the current governing document.*

Page 4.Q-9, first paragraph, has been revised as follows:

statement and development of a Background Report. ~~Drafts of the Plan Elements are currently being reviewed and public hearings on the plan are expected to occur in the later part of 2009, with adoption occurring in 2010.~~ The Draft Santa Clarita Valley Area Plan and Draft Environmental Impact Report were released for public review in September 2009. These documents are currently being revised and will be recirculated later this year. Public hearings are scheduled through 2010 with adoption anticipated to occur in late 2010 or early 2011. Until such time as this plan is adopted, the County's existing Santa Clarita Valley Area Plan prevails.

Page 4.Q-16, first paragraph, has been revised as follows:

trash enclosures, and locking gates would also be provided.[7] Project development would be organized along a system of internal roadways, sidewalks and parkways. Internal roadways would link to the regional network via the extension of Whites Canyon Road from the west

[7] *Written correspondence, James Barber, Section Head, Land Acquisition/Developer Obligations, County of Los Angeles Department of Parks and Recreation, October 20, 2008.*

through the project site east to Sierra Highway. This roadway is planned for two travel lanes in each direction separated by a center median and containing landscaped parkways of variable width within an 88- to 94-foot right-of-way northerly to the public park site and within an 80- to 82-foot right-of-way from the park site to Whites Canyon Road. The extension of Whites Canyon Road was conditionally approved as Skyline Ranch Road by the Los Angeles County Department of Public Works on July 19, 2006 and is shown on the Draft Highway Plan.

Page 4.Q-23, first paragraph, has been revised as follows:

this connecting roadway has been proposed pursuant to consultation with the County and has been conditionally approved by the Los Angeles County Department of Public Works as Skyline Ranch Road. The Los Angeles County Highway Plan currently shows an extension of Whites Canyon Road being routed through the property's proposed northern open space area and the SEA proposed by the County with a connection to Vasquez Canyon Road. The plan also shows a future roadway segment for Cruzan Mesa Road between Whites Canyon Road and Sierra Highway. Issues associated with constructing these roadways as shown in the Highway Plan have been of concern to the County due to the amount of grading that would be required and the impact the proposed alignments would have on sensitive biological resource areas, and the County's interest in establishing an SEA on the project site. The proposed project would support the County's interests in protecting a proposed SEA and eliminating the need to provide the roadways through this regionally significant biological resource area by transferring development to the southern portion of the project site, and providing a new roadway between Whites Canyon Road and Sierra Highway which could serve as an alternative routing. This proposed roadway has been conditionally approved by the Los Angeles County Department of Public Works and, under the current County General Plan Update process, the roadway connection proposed by the project is shown on the Draft Highway Plan. ~~Implementation of an amendment to the Highway Plan will be at the discretion of the County as part of their General Plan update independent of the proposed project.~~ Because the County's General Plan Update process has been delayed, the amendment to the Los Angeles County Master Plan of Highways is proposed under this project to realign Whites Canyon Road to the proposed Skyline Ranch Road and Sierra Highway.

Page 4.Q-30, first paragraph, has been revised as follows:

Further, the project would be consistent with zoning regulations as implemented through the Conditional Use Permit provisions and underlying zoning. Maximum building heights would not exceed 35 feet and setbacks would be consistent the setback requirements (20 feet for front yards (14 feet from the sidewalk), 5 feet for side yards, and 15 feet for rear yards). The location of buildings would be subject to the requirements of the Conditional Use Permit. Furthermore, a Conditional Use Permit would be required for the offsite grading and construction of Skyline

Ranch Road from the western project boundary to Whites Canyon Road and for the temporary operation of a materials processing facility in the northeast corner of the development area.

Section 4.R, Population, Housing and Employment

Page 4.R-4, Footnote 3 has been revised as follows:

[3] *The County is currently updating the General Plan and has prepared a Draft General Plan (September 2008) that is available for public review at: http://planning.lacounty.gov/generalplan. An EIR that addresses the environmental impacts of the amended plan is expected to become available in the fall/winter of ~~2009~~ 2010. Adoption of the updated Countywide General Plan is estimated for ~~2010~~spring 2012. Until this Draft Plan is approved, the existing General Plan is the current governing document.*

Page 4.R-6, Second Paragraph, has been revised as follows:

The Santa Clarita Valley Area Plan was initially drafted prior to the incorporation of the City of Santa Clarita, and was later amended to reflect the incorporation. The City of Santa Clarita is responsible for land use decisions within its jurisdiction, while the County is responsible for land use decisions in the unincorporated area in which the project site is located. However, the project site is located adjacent to the City of Santa Clarita, and would contribute to the overall land use relationships in the area. Because the land use relationships within the City of Santa Clarita and the surrounding unincorporated areas are interrelated, the City and County are cooperatively preparing a 20-year plus Valleywide General Plan, referred to as the "One Valley One Vision," program (OVOV). The OVOV would supplant the existing Santa Clarita Valley Area Plan. Visioning activities for this program began in Summer 2000, with subsequent preparation of a Vision and Guiding Principles statement and development of a Background Report. ~~Drafts of the Plan Elements are currently being reviewed and public hearings on the plan are expected to occur in the later part of 2009, with adoption occurring in 2010.~~ The Draft Santa Clarita Valley Area Plan and Draft Environmental Impact Report were released for public review in September 2009. These documents are currently being revised and will be recirculated later this year. Public hearings are scheduled through 2010 with adoption anticipated to occur in late 2010 or early 2011. Until such time as this plan is adopted, the County's existing Santa Clarita Valley Area Plan prevails.

Page 4.R-13, Fourth Paragraph, Second sentence has been revised as follows:

The project's population change in relation to the three analysis areas is presented in Table 4.R-4, Proposed Project Population, Household, and Employment Impacts, on

page 4.R-15.[6] The population of the proposed project site is projected to increase by ~~4,191~~ 4,158 during the 2007 to 2017 period.

Section 4.S, Global Climate Change

Page 4.S-5, Second Paragraph, has been revised as follows:

An additional bill related to AB32, SB 97, requires the California Office of Planning and Research (OPR), by July 1, 2009, to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions, as required by the California Environmental Quality Act (CEQA), including but not limited to, effects associated with transportation or energy consumption. The Resources Agency will then be required to certify and adopt the guidelines by January 1, 2010, and to periodically update the guidelines to incorporate new information or criteria established by the CARB pursuant to AB32.[10] The OPR released a technical advisory on addressing climate change through CEQA Review on June 19, 2008. This guidance document outlines suggested components to CEQA disclosure: quantification of GHG emissions from a project's construction and operation, determination of signifiance of the project's impact to climate change, and if the project is found to be significant, the identification of suitable alternatives and mitigation measures. On April 13, 2009 OPR submitted to the Secretary for Natural Resources its proposed amendments to the State CEQA Guidelines. These were adopted by the Natural Resources Agency on December 30, 2009 following additional public comment and two public hearings. On December 31, 2009, the Natural Resources Agency transmitted the adopted CEQA amendments to the Office of Administrative Law (OAL). The OAL has 30 working days to review this information. The adopted amendments will become effective 30 days after OAL completes its review and submits them to the Secretary of State for inclusion in the California Code of Regulations.

Pages 4.S-9 and 4.S-10 have been revised as follows:

[6] *The analysis presented in Table 4.R-4 is based on projections in the SCAG 2008 RTP. As such, the analysis is consistent with SCAG Policy 3.01 that states, "The population, housing, and job forecasts, which are adopted by SCAG's Regional Council and that reflect local plans and policies, shall be used by SCAG in all phases of implementation and review."*

[10] *Senate Bill No. 97, Chapter 185, approved by Governor Schwarzenegger and filed with the Secretary of State, August 24, 2007.*

3. PROJECT IMPACTS

a. Thresholds of Significance

The CEQA Guidelines, Section 15064.7, define a threshold of significance as 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. CEQA gives wide latitude to lead agencies in determining what impacts are significant and does not prescribe thresholds of significance, analytical methodologies, or specific mitigation measures.[16] CEQA leaves the determination of significance to the reasonable discretion of the lead agency and encourages lead agencies to develop and publish thresholds of significance to use in determining the significance of environmental effects. However, neither the South Coast Air Quality Management District (SCAQMD), the air pollution control agency for all of Orange County and the urban portions of Los Angeles, Riverside and San Bernardino Counties, nor the County of Los Angeles, the lead agency for the proposed project, have yet established significance thresholds for GHG emissions.[17, 18] The regulations required to meet the State goals under AB32 are still under development~~, expected to be finalized by January 1, 2008, and implemented no later than January 1, 2010~~. Furthermore, pursuant to SB 97, guidelines to be prepared by OPR for addressing greenhouse gas emissions under CEQA ~~will not be adopted until January 1, 2010~~ <u>have been adopted by the Natural Resources Agency and are pending final review and approval by the OAL</u>. Accordingly, at this time there is no formal guidance under CEQA and no available standards by which the approval of a real estate development project can be judged to support or hinder attainment of the State's goals relating to GHG abatement. Furthermore, it is difficult to predict the specific impact of one project's incremental contribution to the global effects of GHG emissions due to a variety of factors, including the complex and long term nature of such effects and the global scale of climate change.[19]

Pages 4.S-24 and 4.S-25 have been revised as follows:

---

[16] *Climate Change and CEQA, Presentation to the Climate Action Team, Cynthia Bryant, Director, Governor's Office of Planning and Research, September 19, 2007.*

[17] *Personal Communication, AQMD Legal Offices, October 4, 2007.*

[18] *Personal Communication, Los Angeles County Department of Regional Planning, Impact Analysis Section, August 28, 2007.*

[19] *Ibid. OPR indicates in the Climate Change and CEQA Presentation to the Climate Action Team that complex questions must be answered before a consistent, effective, and workable process can be developed for evaluating climate change under CEQA. Some of the questions cited include: What constitutes a new GHG emission? What is the appropriate baseline for calculating new emissions? What makes a project's GHG emissions significant? Is the effect of climate change too speculative to be considered a significant environmental impact? How much mitigation is enough to reduce the impact so it is not significant?*

(3) Park and Recreation Objective

- Provide on-site recreational opportunities, including an improved public park and private passive neighborhood and pocket parks convenient and accessible to residents.

- Support extension of the County Trail System by dedicating an easement in the northern portion of the site to the County from Vasquez Canyon Road and terminus of the existing Mint Canyon Trail to the Plum Canyon Fire Road and southwesterly to a lookout point (approximately ~~2.43~~ 2.5 miles).

(4) Resource Conservation Objectives

- Avoid development in regionally significant biotic resource areas located on Cruzan Mesa by designating a 166-acre portion of the site a Non-Development/Continuing Use Area.

- Preserve other significant biotic resources in the northern portion of the site through establishment of one or more voluntary conservation easements, land dedications, or land set asides over a ~~1,378~~ 1,355-acre area to be known as the Skyline Ranch Conservation Area (SRCA).

5.0 ALTERNATIVES

Page 5-4 has been revised as follows:

c. Park and Recreation Objectives

- Provide on-site recreational opportunities, including an improved public park, private passive neighborhood and pocket parks, and hiking trails convenient and accessible to residents.

- Support extension of the County Trail System (Mint Canyon Trail) by dedicating an easement in the northern portion of the site to the County from Vasquez Canyon Road to the Plum Canyon Fire Road and southwesterly to a lookout point (approximately ~~2.2~~ 2.5 miles).

Page 5-6 has been revised as follows:

- Alternate Site Configurations: Other configurations for development on the site beyond those considered in detail below were considered, including large lot residential development of approximately 900 units located on approximately 470 acres in the central portion of the site that would be served by a Cruzan Mesa Road segment between Whites Canyon Road and Sierra Highway. This alternative was not pursued in part because this roadway segment has been rejected in favor of the preferred alignment which was conditionally approved as Skyline Ranch Road by the Los Angeles County Department of Public Works on July 19, 2006 and being supported ~~and carried forward~~ by the County as part of their general plan update. Because the approval process for the general plan update process has been delayed, County staff requested that the Skyline Ranch project initiate the General Plan Amendment to realign Whites Canyon Road/Skyline Ranch Road.

Page 5-13 has been revised as follows:

p. Parks

Under the No Project/No Development Alternative, the project site would remain undeveloped and undisturbed. As such, this Alternative would not result in any demand for parks and recreational facilities in the area, and, thus, the need for such facilities would not increase beyond current levels. Under the No Project/No Development Alternative a trail easement in the northern portion of the site that connects to the regional trail system would not be provided to the County. Since the No Project/No Development Alternative would not affect local parks and recreational facilities or require the construction or expansion of such facilities, no impacts to parks and recreation would occur. This is in contrast to the proposed project where impacts on parks and recreational facilities would be less than significant and more than offset through the provision of a 12-acre (~~10.6~~ 9.2 net acres) fully improved public park site, payment of fees, bike lanes, hiking trails, other private parks, and a dedicated trail easement.

6.0 OTHER CEQA CONSIDERATIONS

Pages 6-3 and 6-4 have been revised as follows:

1. Direct Growth-Inducing Impacts in the Surrounding Environment

A project would directly induce growth if it would remove barriers to population growth such as a change to a jurisdiction's General Plan and Zoning Ordinance which allowed new residential development to occur. Although the proposed project includes a request for a General Plan Amendment to the Los Angeles County Master Plan of Highways to realign Whites Canyon Road to Skyline Ranch Road as a secondary highway to Sierra Highway, this improvement is

consistent with plans shown on the County of Los Angeles Draft Highway Plan currently recommended by the County. As analyzed in Section 4.F, Traffic/Access of the Draft EIR, this proposed alignment would result in little to no change on the surrounding roadway network in comparison to the existing roadway alignment shown in the current Highway Plan. The proposed project would also be developed through a Condition Use Permit (CUP) in accordance with the County Zoning Ordinance. In addition, the density of the project, which involves a density transfer from the northern portion of the site to the southern portion of the site, would be consistent with the provisions of the General Plan and the Santa Clarita Valley Area Plan. This density transfer within the project site would allow the northern 1,551 acres of the site to remain undeveloped, concentrating residential development to the south. The placement of housing in the southern portion of the site would provide residential uses, a public school, and a public park, in areas adjacent to other residential neighborhoods, which lie immediately west and south of the project site already served by fully-established utility services and infrastructure.

4.0 MITIGATION MONITORING PROGRAM

This Mitigation Monitoring Program (MMP), which is provided in Table 4-1, has been prepared pursuant to Public Resources Code Section 21081.6, which requires adoption of a MMP for projects in which the Lead Agency has required changes or adopted mitigation measures to avoid significant environmental effects. The County of Los Angeles is the Lead Agency for the proposed Skyline Ranch project and is therefore responsible for administering and implementing the MMP. The decision-makers must define specific reporting and/or monitoring requirements to be enforced during project implementation prior to final approval of the project. The primary purpose of the MMP is to ensure that the mitigation measures identified in the Draft and Final EIR are implemented thereby minimizing identified environmental effects.

The MMP for the proposed project will be in place through all phases of the project, including design, construction, and operation. The County of Los Angeles Department of Regional Planning (DRP) shall be responsible for administering the MMP. The DRP will also ensure that monitoring is documented through periodic reports and that deficiencies are promptly corrected. The designated environmental monitor will track and document compliance with mitigation measures, note any problems that may result, and take appropriate action to remedy problems. The project applicant is responsible for implementing all mitigation measures and demonstrating the effectiveness of the mitigation measures.

Each mitigation measure is categorized by impact area, with an accompanying identification of:

- The action required;
- When monitoring to occur (e.g., prior to issuance of grading permit, prior to issuance of building permits, post-construction/ongoing);
- The responsible agency or party; and
- The monitoring agency or party.

Table 4-1

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
A. GEOTECHNICAL RESOURCES				
Prior to issuance of grading or building permits, the following mitigation measures shall be revised as necessary to support an equivalent or greater level of environmental protection based on a design-level geotechnical investigation completed to the satisfaction of the County of Los Angeles Department of Public Works:				
4.A-1: The following materials are considered unsuitable and shall be removed and recompacted in the grading of the site: existing fill soils, colluvial deposits and slopewash, alluvial deposits, landslide debris, and terrace deposits. Their removal and recompaction mitigate the potential for seismic settlement.	Submittal and approval of Grading Plan	Prior to issuance of grading permit	Applicant	DPW
4.A-2: Landslides (or portions thereof) that remain in place and are not removed and recompacted following the grading of the project site shall be designated as Restricted Use Areas, in accordance with Los Angeles County Department of Public Works (LACDPW) requirements. Landslides designated as Restricted Use Areas and landslides that are removed and recompacted are identified in the Geotechnical Investigations prepared by Geolabs-Westlake Village (dated March, 6, 2004, August 23, 2004, January 3, 2005, November 16, 2006, April 13, 2007, and August 28, 2008).	Submittal and approval of Grading Plan	Prior to issuance of grading permit	Applicant	DPW

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
4.A-3(a): Interior slopes with daylighted bedding conditions shall be analyzed for appropriate buttress design. Tall cut slopes in the southerly portion of the site are anticipated to expose friable, uncemented bedrock zones and large cobbles and boulders. Several of these slopes require stabilization in order to mitigate the potential for raveling and dislocation of cobbles and boulders. All stability fills and buttresses shall be provided with backdrains and shall incorporate the generalized stability fill key dimensions for the "refacing" of planned cuts slopes.	Submittal and approval of Grading Plan	Prior to issuance of grading permit	Applicant	DPW
4.A-3(b): Fill caps for cut/fill lots shall be constructed to provide uniform foundational support for future structures. Shallow cut lots and cut/fill lots shall be provided with a minimum 5-foot cap of compacted fill. Cut/fill lots underlain by 10 feet or less of compacted fill on the fill portion of the lot shall have the cut portion overexcavated a minimum of 5 feet below finish grade and replaced with compacted fill, thus providing a fill cap with a minimum 5-foot fill thickness. For those transition lots with 10 to 20 feet of fill on the fill side, the cut side shall be provided with a minimum 7-foot-thick fill cap. For those transition lots with in excess of 20 feet of fill on the fill side, the cut side shall be provided with a minimum 10-foot-thick fill cap. Fill caps shall extend a minimum of 5 feet beyond the perimeter footings. Where the backslope is 3:1 or steeper, the last bench prior to reaching the undercut shall be at least 15 feet in width. The 15-foot-wide bench is intended to	Submittal and approval of Grading Plan	Prior to issuance of grading permit	Applicant	DPW

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
reduce the steep dip of the fill-bedrock contact commonly created during undercutting.				
4.A-3(c): All vegetation, trash debris, or other deleterious material shall be stripped from the area to be graded. These materials shall be removed from the site and deposited at a local landfill or recycled on site. Soils bearing sparse grasses may be thoroughly mixed with at least ten parts clean soil and incorporated into the engineered fill. Other materials shall be removed from the site.	Submittal and approval of Grading Plan Field verification	Prior to issuance of grading permit During grading	Applicant Applicant	DPW/DRP DPW/DRP
4.A-3(d): Fill slopes, which toe onto sloping ground, shall be founded in bedrock, below the compressible surface soils. The key shall be at least 20 feet wide and 3 feet deep (measured on the downslope side). The bottom of the key shall be graded so that there is at least 1 foot of fall across its width (toward the upslope side). The key shall be located in front of the toe of slope (as shown on the plan) so that the outside limit of the key lies at or beyond a 1:1 projection from the planned toe of the slope.	Submittal and approval of Grading Plan	Prior to issuance of grading permit	Applicant	DPW
4.A-3(e): Fill-over-cut slopes shall have the fill founded on a 20-foot-wide bench cut into the bedrock or, where bedrock is not present in the cut portion of the slope, on a key cut below the toe of the slope. The 20-foot bench shall be graded to provide at least 1 foot of fall toward its upslope side. If keyed below the toe of slope, then the key shall be at least 20 feet wide, 3 feet deep (below the toe), and tilted (at least 1 foot) into the slope. The cut portion of the slope shall be exposed (and observed by a representative of a	Submittal and approval of Grading Plan Field verification	Prior to issuance of grading permit During grading	Applicant Applicant	DPW Representative of qualified geotechnical firm

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
qualified geotechnical firm) prior to constructing the fill portion of the slope.				
4.A-3(f): Exposed surfaces shall be scarified, moistened, or air-dried, as appropriate, and compacted to 90 percent of the material's maximum dry density prior to placement of fill.	Submittal and approval of Grading Plan Field verification	Prior to issuance of grading permit During grading	Applicant Applicant	DPW DPW
4.A-3(g): Where the ground slopes steeper than 5:1 (horizontal: vertical), the fill shall be properly benched into bedrock.	Submittal and approval of Grading Plan Field verification during grading	Prior to issuance of grading permit During grading	Applicant Applicant	DPW DPW
4.A-3(h): All fill slopes shall utilize mixed soils [sand with some proportion of fines; i.e., clayey sand] in the outer 20 feet of the fill slope in order to minimize the potential for surficial slope deterioration.	Submittal and approval of Grading Plan	Prior to issuance of grading permit	Applicant	DPW
4.A-3(i): Fill materials shall be placed in thin lifts, watered to near the material's optimum moisture content (or to near two percent over optimum moisture content and compacted to the applicable level of relative compaction prior to placing the next lift).	Submittal and approval of Grading Plan Field verification	Prior to issuance of grading permit During grading	Applicant Applicant	DPW DPW
4.A-3(j): The 90 percent relative compaction standard applies to the face of fill slopes. This may be achieved by overfilling the constructed slope and trimming to a compacted finished surface, rolling the slope face with a sheepsfoot, or any method that achieves the desired product.	Submittal and approval of Grading Plan	Prior to issuance of grading permit	Applicant	DPW

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
4.A-3(k): All retaining walls constructed within the project site shall be constructed in accordance with the Los Angeles County Building Code requirements and a design-level geotechnical investigation.	Submittal and approval of Building Plans	Prior to issuance of building permits	Applicant	DPW
4.A-3(l): Backfill for retaining walls shall be properly compacted. An impervious cap shall be provided at the top of the backfill to retard infiltration of water.	Submittal and approval of Building Plans	Prior to issuance of building permits	Applicant	DPW
4.A-3(m): Slope setbacks set forth in the Los Angeles County Building Code shall be applied to residences and appurtenant structures. Structures situated within the setback area shall require special foundation design, which might include deepening footings, pile/caisson construction, and/or consideration of creep loads.	Submittal and approval of Building Plans	Prior to issuance of building permits	Applicant	DPW
4.A-3(n): Backfill for utility trench excavations shall be compacted to at least 90 percent relative compaction. Where installed in sloping areas, the backfill shall be properly keyed and benched.	Submittal and approval of Improvement Plans	Prior to issuance of Improvement Plan	Applicant	DPW
4.A-3(o): Those lots exposed to ascending natural slope conditions shall be provided with drainage ditches or swales, berms or impact walls, and/or small slopes descending from the pads to the natural slopes, to provide protection from potential debris flow hazard.	Submittal and approval of Grading Plan	Prior to issuance of grading permit	Applicant	DPW

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
4.A-4: Expansive lithologies shall be over-excavated where encountered within lots and streets in order to mitigate the potential for differential expansion. The depth of such over-excavation shall range between 7 and 10 feet.	Submittal and approval of Grading Plan Field verification	Prior to issuance of grading permit During grading	Applicant Applicant	DPW DPW
4.A-5: During grading, soils containing significant fines content (cohesive soils) shall be preferentially placed in the outer five feet of fill slopes. In addition, the required 90 percent relative compaction standard shall be applied to the outer face of fill slopes in order to reduce the amount if infiltration and erosion. Cut slopes exposing erodible bedrock formations shall require stabilization with engineered fill.	Submittal and approval of Grading Plan	Prior to issuance of grading permit	Applicant	DPW
B. HYDROLOGY AND WATER QUALITY				
4.B-1: Final drainage improvement plans for the project shall ensure that there is no displacement of flood plain area in the vicinity of Sierra Highway and its intersection with proposed Skyline Ranch Road through construction of a culvert, bridge, or combination thereof, within the flood plain area. Final drainage improvement plans and the culvert or bridge shall be designed during the engineering stage by a licensed engineer to ensure that the water surface shall be equal or lower than existing conditions both downstream and upstream of the proposed project entrance along Sierra Highway and adjacent properties during a 50-year storm event and that post-development flow rates shall be less than existing conditions downstream along Sierra Highway and adjacent properties. Final drainage improvement plans	Submittal and approval of final drainage plans/Drainage Concept Plan	Prior to issuance of phased grading permit	Applicant	DPW/City of Santa Clarita

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
to achieve these standards shall be designed to the satisfaction of, and approved by, the Los Angeles County Department of Public Works and City of Santa Clarita, Department of Public Works.				
4.B-2: Prior to issuance of grading permits, the construction contractor shall prepare an Erosion Control Plan (ECP) that incorporates BMPs to specifically address and reduce the potential for erosion and sedimentation impacts on downstream receiving waters. The project shall include any combination of the following erosion control BMPs: Hydraulic mulch, preservation of existing vegetation, hydroseeding,[1] streambank stabilization, diversion of runoff (such as earth dikes, temporary drains, slope drains), velocity dissipation devices (outlet protection, check dams, and slope roughening/terracing), and dust control measures (such as sand fences and watering). Sedimentation control BMPs may include filtration devices and barriers (such as silt fencing, check berms, debris basins, sediment traps, fiber rolls, sandbags, gravel inlet filters, and straw bale barriers) and/or settling devices (such as sediment traps or basins). Stabilization control BMPs may include blankets, reinforced channel liners, soil cement, fiber matrices, geotextiles, or other erosion resistant soil coverings or treatments. The construction entrance(s)/exit(s) should also be stabilized (e.g. aggregate underdrain with filter	Submittal and approval of Erosion Control Plan/Drainage Concept Plan	Prior to issuance of grading permit	Applicant	DPW/LARWQCB

[1] *California Stormwater Quality Association, California Stormwater BMP Handbook—Construction, January 2003.*

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
cloth). Specific application of these BMPs shall occur before site runoff is discharged to proposed and existing off-site storm drain/flood control channel systems that ultimately discharge water to the Santa Clara River. The ECP shall be reviewed by the Los Angeles County Department of Public Works and by the Los Angeles Regional Water Quality Control Board for inclusion of appropriate and effective erosion and sedimentation controls.				
4.B-3: Prior to issuance of any grading permits, a Notice of Intent (NOI) and a Storm Water Pollution Prevention Plan (SWPPP) shall be prepared by the construction contractor and submitted to the Los Angeles County Department of Public Works and the Los Angeles Regional Water Quality Control Board for approval. The SWPPP shall meet all applicable regulations by requiring controls of pollutant discharges that utilize best available technology economically achievable (BAT) and best conventional pollutant control technology (BCT) to reduce pollutants. The SWPPP shall be certified in accordance with the signatory requirements of the General Construction Permit. The SWPPP shall be developed and amended or revised, when necessary to meet the following objectives: • Identify all pollutant sources including sources of sediment that may affect the quality of storm water	Submittal and approval of Notice of Intent and Storm Water Pollution Prevention Plan/ Drainage Concept Plan	Prior to issuance of grading permit	Applicant	DPW/LARWQCB/ Construction Contractor

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
discharges associated with construction activity (storm water discharges) from the construction site; • Identify non-storm water discharges; • Identify, construct, implement in accordance with a time schedule, and maintain Best Management Practices (BMPs) to reduce or eliminate pollutants in storm water discharges and authorized non-storm water discharges from the construction site during construction; and, • Develop a maintenance schedule for BMPs installed during construction designed to reduce or eliminate pollutants after construction is completed (post-construction BMPs).Paving operations shall be performed using measures to prevent runoff pollution. In compliance with the SWPPP, non-stormwater level BMPs shall be implemented that include controls and objectives for vehicle and equipment maintenance, cleaning, and fueling, and potable water/irrigation practices. Material/waste management BMPs shall include: liquid waste management, spill prevention and control, hazardous waste management, and sanitary/septic waste management. Specific BMPs to be implemented by the construction contractor may include but are not necessarily limited to the following: • Paving operations shall be performed using measures to prevent runoff pollution;				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
• Wash out areas for concrete trucks, construction vehicles and equipment, paint and stucco equipment, and other construction materials shall be designated, and containment measures employed, to prevent discharges of wash water; • Vehicle and equipment maintenance and fueling activities shall occur off-site to the degree feasible; • Construction area, street and pavement washing shall be controlled to preclude discharges of wash water; • Discharging super-clorinated water pipe and sprinkler system flushing and test water to the storm drain system shall be prohibited; • All waste shall be properly stored and disposed of off-site; • Employees and subcontractors shall be trained in the prevention of storm water contamination; • Hazardous material (specifically chlorine- and ammonia-containing products) shall be stored in elevated (e.g., on palates or a deck) and covered structures to prevent any contact between the chemicals and irrigation or precipitation; • All hazardous and chemical materials generated during construction (i.e., diesel fuel, hydraulic fluid, motor oil, etc.) shall be cleaned up and disposed of in compliance with Federal, State, and local laws, regulations and ordinances; and				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
• All structure construction and painting areas shall be enclosed, covered, or bermed to prevent run-on/run-off in these areas and associated contamination of storm water.				
4.B-4: Prior to approval of a NPDES Stormwater Permit No. CAS004001 (Order No. 01-182) and issuance of a grading permit, the applicant or an applicant designee shall complete and have approved a Stormwater Quality Management Plan (SQMP) and a Standard Urban Stormwater Mitigation Plan (SUSMP) outlining usage of BMPs for non-point source pollution control measures to address pollutants from such sources as roofing materials, atmospheric deposition, grease, oil, suspended solids, metals, solvents, phosphates, fertilizers and pesticides. Post-construction structural or treatment BMPs shall be designed to meet performance standards that mitigate (treat) storm water runoff from either: 1) the 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998), or; 2) the volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more treatment by the method recommended in California Stormwater Best Management Practices Handbook—Industrial Commercial, (1993), or: 3) the volume of runoff produced from a 0.75 inch storm event, prior to its discharge to a storm water conveyance system; and, 4) the volume of runoff produced from a historical-	Submittal and approval of Stormwater Quality Management Plan and Standard Urban Stormwater Mitigation Plan/ Drainage Concept Plan	Prior to issuance of grading permit and approval of an NPDES Permit	Applicant	DPW/LARWQCB

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff even. Furthermore, project BMPs and design features shall control peak flow discharge to provide stream channel and over bank flood protection, based on design criteria selected by the local agency. The range of BMPs, which shall meet the performance standards identified above, shall include but not be limited to the following to the extent feasible: <u>Site Planning and Design BMPs</u> Minimize Impervious Area and Directly Connected Impervious Areas • Minimize impervious areas by incorporating landscaped areas over substantial portions of the project area. [For the Skyline Ranch Project, the area designated solely for uses with impervious surfaces are about 401 acres or 18 percent of the entire project site. This means the remaining 1,772 acres or 82 percent will be either vacant or in uses with impervious ground surface such as landscaped and park areas.] • If possible, minimize directly connected impervious areas by draining parking lots to landscaped areas, desilting (secondary infiltration) basins or other previous surfaces to promote filtration and infiltration of storm water, if landscaping slopes				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
are less than 2 percent and the area is not directly adjacent to steep slopes (which promotes further erosion); or the area is being treated with catch basin inserts. Furthermore, lot runoff (from the pervious surfaces) shall be infiltrated from the graded pad areas through onsite pervious soils. • To the extent practicable, utilize vegetated areas (e.g., parks, setbacks, end islands, and median strips) for biofiltration and/or bioretention of nuisance and storm runoff flows from parking lots. <u>Selection of Construction Materials and Design Practices</u> • Select building materials for roofs, roof gutters and downspouts that do not include exposed copper or zinc. • Construct streets, sidewalks, and parking lot aisles to the minimum widths as specified in the Los Angeles County Department of Public Work's requirements (also in compliance with regulations for the Americans with Disabilities Act) for safety requirements for fire and emergency vehicle access and incorporate landscaped buffer areas between sidewalks and streets. <u>Conserve Natural Areas</u> • Concentrate or cluster the development on the least environmentally sensitive portions of the project site while leaving the remaining land in a natural, undeveloped condition. [For the Skyline Ranch				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
Project, about 1,551 acres of the site (71 percent of the project site) is proposed to remain undeveloped, including 1,355 acres to be designated as natural open space through the establishment of the Skyline Ranch Conservation Area (SRCA) .] • Maximize canopy interception and water conservation by preserving existing native trees and shrubs and planting additional native or drought tolerant trees and large shrubs. [For the Skyline Ranch Project, approximately 71 percent of the project site is proposed to remain undeveloped, and along the perimeter of the site, landscaping would consist of a mix of native, drought-tolerant and non-invasive plant species.] <u>Protect Slopes and Channels</u> • Protect slopes and minimize erosion potential by covering highly erodible soils with vegetative cover (preferably native or drought tolerant plants), route flows safely from or away from steep and or sensitive slopes, stabilize disturbed slopes. All slopes within the project should be designed and constructed to minimize erosion. • Protect channels and minimize erosion by controlling and treating flows in landscaping and/or other controls prior to reaching existing natural drainage systems; stabilize channel crossings; ensure that increases in runoff velocity and frequency caused by the project do not erode				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
the channel; install energy dissipaters (riprap), at the outlets of storm drains, culverts and conduits. <u>Source (non-structural) Control BMPs</u> • Drain Inlet Stenciling or Signage. Stenciling (or signage) is intended to raise public awareness and limit illegal dumping of trash, debris, oil, and other pollutants into storm drains. "Stenciling" may be accomplished via a traditional stencil or via the use of grates with text such as “Warning! Drains to Ocean” notes or other equivalent symbols. All catch basins and inlets shall be stenciled. • Irrigation Controls and Management. Irrigation controls shall be implemented to ensure that irrigation is conducted efficiently. Where feasible, plants with similar watering requirements shall be grouped in order to reduce excess irrigation runoff and promote surface filtration. Efficient irrigation systems may include computerized and/or radio telemetry that controls the amount of irrigation based on soil moisture or other indicators. • Proper Application of Fertilizers and Pesticides. Best management practices shall be implemented to minimize the application of fertilizers, pesticides, and other landscape management products on slopes and landscaped areas maintained by the homeowner’s association (HOA) and/or landscape maintenance districts (if any). Examples of these management practices include, but are not to limited to: the use of slow release				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
fertilizers, applying fungicides only to greens to limit the use of pesticides, and closely monitoring weather forecast to ensure appropriate timing (during dry periods) for the application of landscape management products. • Community Education Program. Public education shall be used to reduce the potential for hazardous materials entering the storm drain system. This shall be accomplished through distribution of brochures or other materials to property managers, owners and occupants, and employees at the time of initial sale or lease of property or hiring of employees and periodically thereafter. Brochures shall discuss, among other topics and as appropriate for the audience: 1) the importance of downstream water bodies, the storm water system, management of fertilizers, pesticides, and other harmful chemicals, 2) the impacts of dumping oil, antifreeze, pesticides, paints, and other pollutants into storm drains and proper handling and disposal of these materials, 3) effective cleaning practices such as the cleaning of vehicles only in maintenance areas where the water will be recycled or routed to the sanitary sewer system to prevent nuisance flows, 4) the benefits of the prevention of excessive erosion and sedimentation, 5) the benefits of proper landscaping practices, 6) pavement clean-up practices, 7) the impacts of over-irrigation, 8) swimming pool draining practices, and 9) other relevant issues.				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
• Prevention of Nuisance Flows. Grease traps shall be included for school cafeterias (if any). Draining swimming pools into storm drains shall be prohibited. These flows shall be properly connected to sewer lines. • Pavement Sweeping Program. The majority of roads in the project area are proposed to be dedicated to the public, and would thus be maintained by the Los Angeles County Department of Public Works. The County has street sweeping programs that will help control trash, vegetation debris and sediment that may accumulate on roadways. Other non-public roadways shall also be periodically swept. • Litter Control Program & Design of Trash Storage Areas. A program for litter control shall be implemented to control litter in common areas. The program may include standards for proper placement and emptying of trash receptacles, practices to ensure that trash bins are maintained in the closed position, and regular removal of trash from parking and landscaped areas. In conjunction with the litter control program, trash storage areas shall be designed to prevent introduction of pollutants into runoff. The design principles to prevent this pollution from occurring are using impervious surfaces for storage areas which prevent run-on from adjacent areas, ensuring that there is no connection of trash drains to the storm drain system, and keeping lids on all trash				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
receptacles in addition to the use of roofs or awnings to minimize direct precipitation. • Proper Connection and Maintenance of Sewer Lines. Sewer lines shall be properly connected and adequately maintained. • Activity Restrictions (Conditions, Covenants, and Restrictions). For source control BMPs, County maintenance and implementation of BMPs or Conditions, Covenants, and Restrictions (CC&Rs) shall be prepared requiring maintenance and implementation of BMPs by the HOA for the purpose of surface water quality protection, or use restrictions shall be developed through lease terms. • BMP Maintenance. Los Angeles County shall assume responsibility for the inspection and maintenance of structural BMPs within their boundaries. For the public school site, the school district with jurisdiction shall be responsible for the inspection and maintenance of structural BMPs. For private roads and private parks the HOA shall be responsible for BMP maintenance. • Common Area Drainage Facility Inspection. Privately-owned common area drainage facilities shall be inspected each year and, if necessary, cleaned and maintained prior to the storm season. <u>Structural and Treatment Control BMPs</u> Implementation of NPDES General Permit requirements entails the use of post-construction				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
structural controls that will remain in service to protect water quality throughout the life of the project. Therefore, these BMPs will need to be regularly maintained for proper function. As Los Angeles County will assume maintenance of BMPs in public rights-of-way, the main structural BMPs recommended below are systems that the County currently approves of for use within their jurisdiction. Final selection, design and siting of structural BMPs will ultimately depend on the project-wide drainage plan approved by the County. The following BMP options were selected due to their relative effectiveness for treating potential pollutants from the project site; as well as consideration for County of Los Angeles requirements and acceptance of these systems (as they would be maintained by the County), site feasibility, relative costs and benefits; and other constraints. The recommended BMP design flow rates, volumes, types and other specifications will be provided during final design stage of the project (with hydrology map approval). • Hydrodynamic Separator Systems and Gross Solids Removal Devices. Hydrodynamic Separation Systems (HSS) and Gross Solids Removal Devices (GSRDs) are flow-based, flow-through BMPs that are installed within a storm drain line in order to remove large sediment particles and associated storm water pollutants, as well as trash, oils, and grease. HSS and/or GSRDs, such as a Continuous Deflective Separator (CDS), manufactured by CDS Technologies, Inc., supplemented with oil absorbent materials (such as pellets), are				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
recommended for use at various locations in the proposed storm drain systems. Depending on the particular model and manufacturer, maintenance shall occur quarterly to yearly for clean-outs. Cleaning after a storm event may also be required. Inspection is required to make certain that the unit is operating correctly and to make any repairs. • Stormscreen. The StormScreen is a manufactured patented BMP by CONTECH Stormwater Solutions, Inc., designed to remove mostly trash and debris and larger suspended solids at high flow rates. The StormScreen is comprised of a grouping of StormScreen cartridges placed in a precast or cast-in-place concrete vault. Although maintenance may be required within six (6) months of project completion due to erosion occurring on newly constructed sites, it is intended that the StormScreen be maintained annually by the Los Angeles County Department of Public Works, Flood Control Division. For the StormScreen maintenance, during the first year, an inspection is recommended every other month for the first six months of operation in order to develop an ongoing maintenance schedule. A visual inspection can be conducted without entering the vault. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. • Catch Basin Inserts. Catch basin inserts are flow-based BMP options for consideration at various locations to treat runoff before it enters the storm				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
drain system by filtering or screening out sediments and associated storm water pollutants during dry weather and low flow events. During large flow events, they are typically designed to allow storm water runoff to bypass the inlet device and continue directly into the storm drain system. Although treatment levels are generally low for the pollutants of concern for this project, the inserts would provide pre-treatment of storm water runoff prior to further treatment at downstream BMPs. Drainage inserts could be replaced with HSS or GSRDs that perform similar functions and are interchangeable. At the time of final design, if the implementation of a CDS is deemed infeasible, a catch basin insert may be used in its place. Although maintenance requirements vary greatly depending on the particular model and manufacturer, they are typically maintained quarterly to yearly for clean-outs. Cleaning after a storm event and in anticipation of storm events after extended dry periods or periods of typical debris removal is recommended. Inspection will be required to make certain that the unit is operating correctly and to make any repairs.				
• Detention/Retention Basins. Detention and retention basins require a fairly large amount of space to build them. Basins can be used on sites with slopes up to about 15 percent. The design should incorporate enough elevation drop from the basins inlet to the outlet to ensure that flow can move through the system. These systems require				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
regular maintenance (semi-annual and annual), as well as sediment removal from the forebay every 5 to 7 years and monitoring the sediment accumulation and removal when the volume has been significantly reduced (about every 25 to 50 years). Basins shall be properly maintained to avoid safety hazards.				
C. BIOLOGICAL RESOURCES				
4.C-1 Mitigation for grading and fuel modification impacts (calculated 200 feet beyond the limits of grading) to 467.9 acres of combined **coastal sage scrub** and **disturbed coastal sage scrub** (452.3 acres within on- and off-site, and 15.6 acres within on- and off-site fuel modification zones), 77.0 acres of **coastal sage-chaparral scrub** (69.9 acres within on- and off-site grading and 7.1 acres within on- and off-site fuel modification zones), and 2.8 acres of **holly-leafed cherry scrub** (2.1 acres within on-site grading and 0.7 acre within on- and off-site fuel modification zones) shall be provided by establishing a 1,355 acre conservation area [Skyline Ranch Conservation Area (SRCA)] within the northern portion of the study area as shown in Figure 2-3, Aerial View-Development and Conservation Area. The applicant shall cause the preservation of this 1,355-acre area through either a Declaration of Restrictions or a Conservation Easement, or dedication or transfer of the land to a conservation organization committed to the preservation of the land in perpetuity. A Declaration of Restrictions, Conservation Easement, or similar	Prepare a Declaration of Restrictions, Conservation Easement, or dedication or transfer to ensure the preservation of the 1,355 acre Skyline Ranch Conservation Area	Prior to transfer of SRCA	Applicant	DRP/Qualified Biologist

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
recorded instrument shall be placed and recorded in this area to ensure its long-term preservation. The applicant shall arrange for the long-term management of the property to ensure the long-term persistence of the property's biological resources through a non-profit organization, conservation-oriented entity, or entity with experience in biological resource conservation approved by the County. The applicant shall provide long-term funding to assure the management of the property to protect its biological resources in perpetuity. The SRCA includes approximately 623.9 acres of coastal sage scrub, 115.8 acres of disturbed coastal sage scrub, 248.6 acres of coastal sage-chaparral scrub, and 10.6 acres of holly-leafed cherry scrub. This area shall be preserved as natural open space. These 1,355 acres provide substantial ecological value based on the quantity, quality, and regional value of the habitats preserved. Establishment of the 1,355-acre SRCA shall achieve the following performance standards: 1. Provision of sufficient quantity of habitat to offset vegetation impacts associated with the proposed project. When considering coastal sage scrub, disturbed coastal sage scrub, coastal sage-chaparral scrub, and holly-leafed cherry scrub collectively, this 1,355-acre area will provide close to 2:1 preservation of like and contiguous habitats [1,354.6 acres preserved vs. 642.1 acres impacted (621.7 acres impacted by grading and 20.4 acres impacted by fuel modification)]. Preserved habitats are similar to those impacted				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
by the project and most vegetation communities (with the exception of sycamore woodland), regionally common species, and special status plant and wildlife species impacted by the project are represented within the SRCA.				
2. An on-going maintenance and management program shall be adequately funded and implemented to ensure the long-term integrity of biological resources within the 1,355-acre SRCA. Direct and indirect degradation of habitat shall be prevented in part through steep topography that separates the SRCA from the proposed development area and through the prohibition or restriction of uses within the SRCA. 3. The SRCA shall include signage, where appropriate, and other management practices to discourage off-road vehicles, domestic pets, and other activities harmful to natural lands. 4. Any continued use of lands within the SRCA (such as film-making) shall be subject to approval by the SRCA habitat manager and restricted to uses that are not incompatible with the resource conservation objectives of the SRCA.	Establishment, submittal, and approval of maintenance and management program for the SRCA to DRP	Post-Construction/Ongoing	Applicant and subsequent owner(s)	DRP/Qualified Biologist
5. A 21.6-acre Mitigation Exchange Area shall be provided to replace the 21.6 acres of preserve area that would be disturbed within Tract 46018 due to the construction of Skyline Ranch Road. This shall be established separately from the SRCA through an agreement between the applicant,	Establish a 21.6-acre Mitigation Exchange Area through an agreement between the applicant, Shapell-Monteverde Partnership,	Prior to issuance of grading permit	Applicant	DRP/ACOE

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
Shapell-Monteverde Partnership (owner of the recorded Tract 46018), the Army Corps of Engineers, and the County of Los Angeles.	the Army Corps of Engineers, and the County of Los Angeles			
6. Following grading operations any areas that have been disturbed within the 50-foot grading buffer zone; which includes coastal sage scrub (10.7 acres), disturbed coastal sage scrub (6.1 acres), coastal sage-chaparral scrub (3.3 acres), non-native grassland (1.8 acres), disturbed (0.8 acres), holly-leaved cherry scrub (0.7 acres) and sycamore riparian woodland (0.2 acres), shall be restored to pre-graded conditions by a qualified biologist. Restoration shall be designed to provide the same vegetation resources and habitat value as those removed within the buffer zone. At the end of all project grading, proposed restoration actions within the buffer zone (if necessary) shall be presented in a restoration plan provided to the County. Following approval by the County, restoration shall be initiated and completed according to the approved restoration plan.	Submittal and approval of a restoration plan	Following grading operations and prior to issuance of building permit	Applicant	DRP/Qualified Biologist
4.C-2: As detailed in the Habitat Mitigation and Monitoring Plan (HMMP) prepared by GLA, mitigation for impacts to 5.22 acres of Army Corps of Engineers (ACOE) and RWQCB jurisdiction, none of which consists of jurisdictional wetlands, and 9.30 acres of California Department of Fish and Game (CDFG) jurisdiction (of which 2.91 acres is vegetated riparian habitat) shall be accomplished by the applicant through the following:	Comply with provisions of Habitat Mitigation and Monitoring Plan and obtain permits from the Army Corps of Engineers, the Regional Water Quality Control Board, and from the California Department	Prior to transfer of SRCA	Applicant	DRP/ACOE/LARWQCB/CDFG

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
1. The preservation of 1,355 acres of natural open space within the SRCA through the use of a conservation easement or the dedication of such land to a qualified conservation organization. This 1,355-acre area includes approximately 5.35 acres of ACOE and RWQCB jurisdiction, none of which consists of jurisdictional wetlands and approximately 5.71 acres of CDFG jurisdiction (of which 0.31 acre is vegetated riparian habitat). 2. The preservation of 1.53 acres of southern vernal pool and artificial pool habitats within the SRCA subject to RWQCB jurisdiction. 3. On-site establishment of 7.27 acres of sycamore/cottonwood riparian woodland within Plum Canyon. As described further in the HMMP, the proposed 7.27-acre sycamore riparian woodland (mitigation site) will be established within portions of Plum Canyon on-site within the SRCA as shown in Figure 4.C-7, Proposed Conservation and Mitigation Areas, on page 4.C-74. Hydrology is currently present at the mitigation site and the mitigation site supports Cortina sandy loam and Saugus loam which are conducive to the establishment of sycamore riparian woodland. An ACOE-approved reference site will be used prior to implementation of the mitigation program to provide the necessary data to measure the performance of the mitigation site.	of Fish and Game			

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
The plant palette for the proposed mitigation site includes the planting of two riparian species; 727 one-gallon containers of Fremont cottonwood and 1,818 one-gallon containers of western sycamore. One-gallon upland buffer species will also be planted including chamise, hoaryleaf ceanothus, California buckwheat, deerweed, coast prickly pear, snake cholla, scrub oak, white sage, black sage, and our Lord's candle. A seed mix of 12 native shrub and herbaceous species will also be used. The planting of a sycamore riparian woodland in the vicinity of the holly-leafed cherry woodland is not intended to, nor is it expected to, result in an inadvertent conversion of the riparian area from holly-leafed cherry to sycamore woodland. The creation of 7.27 acres of sycamore riparian woodland within Plum Canyon within the SRCA is expected to provide an overstory on the edges of the holly-leafed cherry woodland that replicates the conditions currently found in Drainage 5 (where impacts are proposed). On-site occurrences of both species indicate that they can exist concomitantly without the risk of conversion from one type to another altogether. With appropriate spacing and the use of drip irrigation on the planted sycamores, the existing swath of holly-leafed cherry will not be adversely affected by the addition of the sycamore riparian woodland.				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
The HMMP includes a number of features to ensure the success of the mitigation site including supervision by a qualified habitat restoration specialist, a 5-year qualitative and quantitative monitoring program, contractor education, the use of mycorrhizal fungi, supplemental irrigation, regular maintenance (e.g., exotic vegetation control, pest control, trash removal), and adaptive management assurances. The Hybrid Functional Assessment (HFA) conducted by GLA (2009) concluded that the proposed project, considering off-setting mitigation measures, would result in a 25 percent increase in the total functionality of the aquatic features remaining within the SRCA after project implementation. In addition to the measures proposed above, the project will require permits from the ACOE under section 404 of the Clean Water Act (CWA), from the Regional Water Quality Control Board (RWQCB) under section 401 of the CWA, and from the CDFG under section 1602 of the State Fish and Game Code. Should the ACOE, RWQCB, and/or CDFG impose additional or greater mitigation measures on the project for these impacts, those measures – to the extent that they exceed what is required by the measures contained herein – may be substituted for the measures set forth herein, as the County does not intend to require the project to mitigate twice for the same impact once the project has already mitigated the impact below a level of significance.				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
4.C-3: In order to avoid impacts to nesting birds protected by the Migratory Bird Treaty Act and raptors protected by State Fish and Game Code, project grading and vegetation removal should take place outside of the nesting season, roughly defined as mid-February to mid-August. If grading or vegetation removal is to take place during the nesting season, a biologist acceptable to Los Angeles County shall be present during vegetation clearing operations to search for and flag active nests so that they can be avoided. A raptor survey will also be required in the unnamed canyon prior to the fill of that drainage. An avoidance buffer of 100 to 500 feet (exact radius to be determined by the monitoring biologist) will be fenced around any active raptor nests and impacts to nests will be avoided until after the nesting season is over. After mitigation the anticipated impact on nesting birds is less than significant. The results of the nesting bird construction monitoring will be provided in writing to the CDFG and County Department of Regional Planning (DRP).	If grading or vegetation removal is to take place during the nesting season, a biologist shall survey and mark active nesting areas to avoid	Prior to grading	Applicant	Qualified Biologist/DRP/CDFG
	Conduct a raptor survey of the unnamed canyon prior to the fill of that drainage and delineate an avoidance buffer	Prior to grading	Applicant	DRP/CDFG
	Provide written report documenting results of nesting bird construction monitoring/Field verification	After grading	Applicant	DRP/CDFG/Qualified Biologist
4.C-4: To mitigate the loss of the coast live oak on-site (32 inches diameter at breast height [dbh]) in the southeastern section of the study area, an oak tree permit will be obtained from the County. The impacted oak tree will be replaced at a minimum ratio of 10:1 in the appropriate location at the interface between development and undeveloped areas. This ratio is in excess of the mitigation ratio set forth in the County ordinance, which is 2:1.	Obtain oak tree permit	Prior to issuance of grading permit	Applicant	DRP

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
No mitigation is necessary for oak woodlands regulated under SB 1334 because no oak woodlands occur within the study area.				
The loss of two California junipers within mixed coastal sage chaparral scrub shall be replaced in the landscaping scheme along roadways and in parks and other recreational areas at a minimum ratio of 3:1. Trees grown from local area stock shall be used, along with salvaged trees from the development area where possible.	Submittal and approval of Landscape Plan	Prior to issuance of grading permit	Applicant	DRP
To mitigate the potential loss of the coast live oak off-site, the Applicant shall obtain an oak tree removal permit from the City of Santa Clarita for the coast live oak tree that may be adversely impacted by trenching for the proposed 78-inch pipeline installation, prior to initiation of pipeline trenching and construction. To the extent feasible, impacts to areas within the drip line (or root system) should be avoided during construction.	Avoid root system during grading or obtain oak tree removal permit Field verification	Prior to issuance of grading permit During grading/construction	Applicant	DRP/DPW/City of Santa Clarita/Qualified Biologist
4.C-5: To mitigate potentially significant indirect impacts to open space areas adjacent to fuel modification zones due to the possible spread of invasive plant species, the proposed project shall incorporate the use of native plant species to the maximum extent practicable and avoid the use of plant species known to be highly invasive adjacent to open space areas. The plant palette for the fuel modification areas adjacent to open space areas shall be consistent	Submittal and approval of Fuel Modification Plan and Landscape Plan	Prior to issuance of grading permit	Applicant	Fire Department/DRP

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
with the County of Los Angeles Fire Department Fuel Modification Plan Guidelines[2] and shall focus on native species provided in the table of desirable plant species.				
D. CULTURAL AND PALEONTOLOGICAL RESOURCES				
4.D-1(a): Archaeological Monitoring. Archaeological Monitoring. At the commencement of project grading or construction, all workers associated with earth disturbing activities (particularly remedial grading and excavation) shall be given an orientation regarding the possibility of exposing unexpected archaeological material and/or cultural remains by a qualified archaeologist who satisfies the Secretary of the Interior's Professional Qualification Standards for Archaeology (prehistoric/historic archaeology) pursuant to 36 CFR 61. The archaeologist shall also instruct the workers as to what steps are to be taken if such a find is encountered. Due to the moderate sensitivity and possibility of buried cultural materials within the project area, it is recommended that initial grading and ground disturbing activities in areas determined to be sensitive (primarily those areas proximal to recorded sites) be monitored by an archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards for Archaeology (prehistoric/historic archaeology) pursuant to	Provide orientation to all workers associated with earth disturbing activities. Monitor initial grading and ground disturbing activities. Stop work if cultural remains are discovered and notify the applicant and County. If necessary, formulate and implement a mitigation plan.	Prior to and during grading/construction	Applicant	Qualified Archaeologist/DPW

[2] *County of Los Angeles Fire Department, Fuel Modification Unit, Prevention Bureau, Forestry Division, Brush Clearance Section. Fuel Modification Plan Guidelines. January 1998. Available at http://www.fire.lacounty.gov/Forestry/PDF/FuelModificationPlan.pdf.*

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
36 CFR 61. The archaeologist shall have the authority to stop work if sensitive or potentially significant cultural remains are discovered during excavation or ground disturbing activities. Test excavations may be necessary to reveal whether such cultural materials are significant. In the event the archaeologist indicates that a significant or unique archaeological/cultural find has been unearthed, grading operations shall cease in the affected area until the geographic extent and scientific value of the resources can be reasonably verified. Upon such discoveries the archaeologist shall notify the applicant and Los Angeles County. Any excavation and recovery of resources shall be performed by a qualified archaeologist using standard archaeological techniques. If necessary, a mitigation plan shall be formulated. Work in the area shall only resume with the approval of the project archaeologist. Artifacts, notes, photographs, and other project materials recovered during the monitoring program shall be curated at a facility meeting federal and state standards.				
4.D-1(b): Human Remains. If human remains are unearthed, State Health and Safety Code Section 7050.5 requires that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code Section 5097.98. If the remains are determined to be of Native American descent, the coroner will notify the Native American Heritage Commission (NAHC). The NAHC will then identify the person(s) thought to be the Most Likely	Stop work if human remains are discovered and notify County Coroner. If the remains are Native American then follow recommendations of Most Likely Descendent for disposition.	During grading/construction	Applicant	DPW/County Coroner/NAHC/MLD Representative

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
Descendent (MLD) of the deceased Native American, who will have 24 hours to make a formal recommendation as to disposition of the remains. All work associated with the remains will be done respectfully, and with recognition that the remains are considered sacred. All work in the area of the remains will be monitored by an authorized representative of the MLD.				
4.D-2(a): Paleontological Survey and Treatment Program. Prior to the implementation of grading or construction related activities, a qualified paleontologist shall be retained by the applicant to survey the project area to relocate known fossil localities, and determine the most sensitive areas. A qualified paleontologist is defined as a paleontologist meeting the criteria established by the Society for Vertebrate Paleontology including institutional affiliations/credentials, ability to recognize and recover vertebrate fossils in the field, local geological and biostratigraphic expertise, proficiency in identifying vertebrate fossils, publications in scientific journals. Following the survey, a paleontological resources monitoring and mitigation program will be developed by the qualified paleontologist that will include salvage of known fossil resources, areas that will be monitored during project-related earth-moving activities. The paleontological resources monitoring and mitigation program shall be submitted to the County for review and approval prior to construction grading activities. The program shall define specific procedures for construction monitoring; emergency discovery; sampling and data recovery, if	Conduct paleontological survey. Submittal and approval of a paleontological resources mitigation and monitoring program.	Prior to issuance of grading permit and during grading/construction	Applicant	Qualified paleontologist/DPW

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
needed; museum storage of any specimen and data recovered; preconstruction coordination; and reporting. Any curation costs shall be incurred by the applicant.				
4.D-2(b): Paleontological Monitoring. The paleontological monitor, who has been trained by a qualified paleontologist to identify vertebrate fossils, shall monitor earth-moving construction activities at depths determined to be sensitive as specified in the County approved monitoring plan. Monitoring will not be conducted in areas where the ground has been previously disturbed or in areas where exposed sediment will be buried, but not otherwise disturbed.	Monitor sensitive areas as determined in the County approved monitoring plan.	During grading/construction	Applicant	Qualified Paleontologist/DPW
4.D-2(c): Paleontological Data Recovery. Prior to the start of grading or construction related activities, construction personnel involved with earth-moving activities shall be informed of procedures to follow if fossil remains are encountered. In the event that paleontological resources are encountered during construction-related earth-moving activities, all work shall cease within the immediate area and be redirected elsewhere until the paleontological monitor has evaluated the situation and provided recommendations for the protection of, or mitigation of adverse effects to, significant paleontological resources assessed. Upon such discoveries, the contractor shall notify the applicant and Los Angeles County. Procedures for mitigating potential impacts to significant paleontological resources shall follow the monitoring and mitigation program previously developed under this mitigation measure. Construction work within this	Provide orientation to all workers associated with earth disturbing activities. Stop work if paleontological resources are encountered. Evaluate resources and provide recommendations for mitigation. Notify the applicant and County.	Prior to and during grading/construction	Applicant	Qualified Paleontologist/DPW

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
area shall resume upon approval from the principal project paleontological monitor.				
E. VISUAL QUALITIES				
4.E-1: During construction, the applicant or his contractors shall locate equipment, stockpiles, and staging areas out of direct public or private view to the extent feasible.	Field Verification	During construction	Applicant	DPW/DRP
4.E-2(a): To reduce the significant aesthetic impact associated with graded slopes and paved terrace drains along the southern entrance to the project site, the slopes on both sides of proposed Skyline Ranch Road shall be revegetated and landscaped as soon as feasible following grading and roadway development. Landscaping in this area shall be selected and planted to screen proposed terrace drains from public views and to merge ornamental and native materials such that sharp contrasts in form and color with undeveloped areas are avoided.	Revegetate and landscape slopes on both sides of Skyline Ranch Road Field Verification	After grading	Applicant	DRP/DPW
4.E-2(b): A landscape plan for the planned residential development shall be prepared by a Landscape Architect with a plant palette that will merge ornamental and native materials such that shape contrasts in form and color are avoided with adjacent undeveloped areas. Trees and shrubs on streets, slopes and ridgelines should emphasize mounded rather than columnar forms (such as palm trees and cypress). Plantings on the hillsides to the south and east of the entry road shall be specifically selected, sized, and placed to soften angular forms created by grading at	Submittal and approval of Landscape Plan Maintain landscaping/Field verification	Prior to issuance of grading permit Post Construction/Ongoing	Applicant HOA	DRP DRP

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
the interface of manufactured slopes and natural hillsides. Furthermore, every effort shall be made as grading plans are finalized and during grading to create rounded landforms that are generally reflective of the natural topography of the area. Planting of common landscape areas shall be undertaken as soon as possible following grading to avoid prolonged view degradation. Landscaping on the site shall be routinely maintained by a homeowners association and/or through Covenants, Conditions and Restrictions (CC&Rs) throughout the life of the project. The landscape plan shall be subject to review and approval by the County prior to issuance of any grading permits.				
F. TRAFFIC/ACCESS				
4.F-1(a): Plum Canyon Road at Skyline Ranch Road/Heller Circle (South)): Prior to issuance of a certificate of occupancy, the project shall redesign and construct the new east leg (Skyline Ranch Road) to include one left-turn lane, one shared left/through lane, and one right-turn lane; and restripe the existing west leg (Heller Circle South) to consist of one left-turn lane and one shared through/right-turn lane; and restripe the existing north leg (Plum Canyon Road) left-turn pocket to allow the left-turn movement. Implementation of improvements and fair share determination shall be coordinated with adjoining Tract 46018, since many of the stated improvements are conditions of approval for Tract 46018 and are required to be in place prior to occupancy of Tract 46018 or the proposed project.	Coordinate roadway improvements for Plum Canyon/Skyline Ranch Road/Heller Circle and payment of fair share fees with adjoining Tract 46018	Prior to issuance of a certificate of occupancy	Applicant	DPW

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
4.F-1(b): Golden Valley Road at Plum Canyon Road: The project shall pay its fair share (53 percent) to restripe the northbound Golden Valley Road approach to provide a second left-turn lane, for a total of two northbound left-turn lanes, one northbound through lane, and one northbound right-turn lane. Timing of improvement shall be determined by the County based on Bridge and Thoroughfare (B&T) District priorities.	Payment of fair share fees	Prior to final tract map approval	Applicant	DPW
	Submittal and approval of striping plans for Improvements to Golden Valley Road	Prior to final tract map approval	Applicant	DPW
	Construction of improvements	To be determined based on B&T District priorities	Applicant	DPW
4.F-2(a): Sierra Highway at Soledad Canyon Road: The project shall pay its fair share (100 percent) to add a second southbound left-turn lane, for a total of five approach lanes and reconfigure the approach lanes as two left-turn lanes, two through lanes, and one right turn lane, so as to mirror the northbound approach. This improvement may require the acquisition of additional right-of-way to widen the southbound approach of the north leg. Timing of improvement shall be determined by the City based on B&T District priorities.	Payment of fair share fees	Prior to final tract map approval	Applicant	DPW/City of Santa Clarita
	Submittal and approval of striping plans for improvements to Sierra Highway	Prior to final tract map approval	Applicant	DPW/City of Santa Clarita
	Construction of improvements	To be determined based on B&T District priorities	Applicant	DPW/City of Santa Clarita
4.F-2(b): Sierra Highway at Skyline Ranch Road: Prior to the issuance of the 301st building permit the project shall construct a new intersection for project access; provide one northbound left-turn lane, two northbound through lanes, two southbound through lanes, one eastbound left-turn lane, and two eastbound right-turn lanes; and install a traffic signal. The placement of the new west leg should be of sufficient distance from the Sierra Highway centerline to allow	Submittal and approval of striping plans for intersection improvements to Sierra Highway at Skyline Ranch Road	Prior to final tract map approval	Applicant	DPW/City of Santa Clarita
	Construction of improvements	Prior to issuance of the 301st building	Applicant	DPW/City of Santa Clarita

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
for the eventual addition of a third southbound through lane as identified in the City of Santa Clarita General Plan Circulation Element.		permit		
4.F-3: In the event the State approves a Caltrans impact fee mitigation program prior to implementation of the proposed project, the applicant shall pay a fair share to fund programmed improvements to Highway 14 that would mitigate the project's contribution to cumulative impacts on the highway. Such improvements may include the addition of HOV lanes, truck lanes, and additional mixed flow lanes to the segments of Highway 14 between Sand Canyon Road to south of the Sierra Highway interchange, that have been identified in the Short Range Plan outlined in the North County Combined Highway Corridors Study.	Payment of fair share fees if Caltrans impact fee mitigation program approved and implemented by the State	Prior to implementation of the project (if Caltrans impact fee program implemented)	Applicant	DPW/Caltrans
G. NOISE				
4.G-1(a): Construction truck routes and equipment shall, to the extent feasible, avoid residential areas and roadways adjacent to noise sensitive receptors.	Submit a copy of approved Building Plans with note referencing noise attenuation measures Field Verification	During construction During construction	Applicant/Contractor Applicant/Contractor	DPW DRP

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
4.G-1(b): Wherever heavy duty truck traffic associated with project construction utilizes roadways with adjacent noise sensitive receptors, the trucks shall avoid peak hour traffic in order to minimize potential truck idling in proximity to these receptors.	Submit a copy of approved Building Plans with note referencing noise attenuation measures	During construction	Applicant/Contractor	DPW
	Field Verification	During construction	Applicant/Contractor	DRP
4.G-2(a): All construction activities within 300 feet of an occupied single- or multi-family residential lot shall be restricted to between the hours of 7:00 A.M. and 7:00 P.M. Monday through Friday, and between 8:00 A.M. and 6:00 P.M. on Saturday. Construction work shall be prohibited on Sundays, New Year's Day, Independence Day, Thanksgiving Day, Christmas Day, Memorial Day, and Labor Day.	Submit a copy of approved Building Plans with note referencing noise attenuation measures	During construction	Applicant/Contractor	DPW
	Field Verification	During construction	Applicant/Contractor	DRP
4.G-2(b): The construction contractor shall provide at least 72-hour advance notice of the start of construction activities to all noise sensitive uses within 300 feet of on-site and off-site occupied residences. Notification shall be by mail. The announcement shall state specifically where and when construction activities will occur, and provide contact information for filing noise complaints. Notices shall provide tips on reducing noise intrusion, for example, by closing windows facing the planned construction.	Submit a copy of approved Building Plans with note referencing noise attenuation measures	Prior to beginning construction/During construction	Applicant/Contractor	DPW/DRP
	Prepare and distribute notice	Prior to beginning construction/During construction	Applicant/Contractor	DPW/DRP
4.G-2(c): When construction operations occur within 300 feet of on-site or off-site occupied residences, all feasible measures to reduce construction equipment noise levels at the residences shall be employed. These measures shall include among other things changing	Submit a copy of approved Building Plans with note referencing noise attenuation measures	During construction	Applicant/Contractor	DPW/DRP

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
the location of stationary construction equipment to increase the distance between the equipment and the receptors, shutting off idling equipment, notifying residents in advance of construction work, and installing temporary acoustic barriers around stationary construction noise sources.	Install temporary acoustic barriers Field verification	During construction During construction	Applicant/Contractor Applicant/Contractor	DRP DRP
4.G-2(d): Prior to construction of structures on the residential lots east of existing residences east of Falcon Crest Drive and Bakerton Avenue, temporary acoustic barriers shall be erected along the rear lot lines within 300 feet of the western site boundary. The extent of this requirement, including the height, length, number of properties, etc., shall be determined by an acoustical consultant retained by the applicant with access to project-related design and construction information. These barriers may be constructed of any solid material, shall be continuous with no gaps, and shall remain in place until building construction on these lots is completed.	Submit a copy of approved Building Plans with note referencing noise attenuation measures Prepare acoustical study Install temporary acoustic barriers Field verification	Prior to building construction Prior to building construction Prior to building construction During construction	Applicant/Contractor Applicant Applicant Applicant	DPW/DPH Acoustical Consultant/DPW/DPH DRP DRP
4.G-3(a): Prior to construction of any residential development along Skyline Ranch Road a detailed acoustical analysis report prepared by a qualified acoustical consultant shall be submitted to the County for review and approval. For all on-site single family residences that have rear and/or side yard lines within 100 feet from the centerline of the proposed Skyline Ranch Road, the acoustical analysis report shall describe and quantify the noise sources impacting the area and the measures required to meet the 60 dBA CNEL residential noise standard. Based on a	Submit a copy of approved Building Plans with note referencing noise attenuation measures Submittal and approval of a detailed acoustical analysis report Field verification	Prior to building construction Prior to building construction Prior to occupancy	Applicant Applicant Applicant	DPW/DPH Acoustical Consultant/DPW/DPH DRP

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
preliminary acoustical analysis included in Appendix G of this Draft EIR, the placement of a 6-foot high solid masonry wall is recommended at the locations shown in Appendix G, Figures 1 through 8, in order to achieve this noise standard.				
4.G-3(b): Balconies, greater than six (6) feet in depth, are considered exterior living areas and must also meet the exterior noise standard. Therefore, balconies shall either be discouraged from exposure to exterior noise levels greater than the 65 dBA CNEL (residences that are within 50 feet from the edge of the proposed Skyline Ranch Road) standard for single-family residences through architectural or site design, or balconies shall be enclosed by solid noise barriers, such as 3/8-inch glass or 5/8-inch Plexiglas or other equally effective construction materials to a height specified by a qualified noise consultant.	Submit a copy of approved Building Plans with note referencing noise attenuation measures	Prior to building construction	Applicant	Acoustical Consultant/ DPW/DPH
4.G-3(c): All on-site single-family residences within 50 feet of the Skyline Ranch Road right-of-way shall include whole-house air conditioning so that windows facing the roadway may be closed without compromising a comfortable interior living environment.	Submit a copy of approved Building Plans with note referencing noise attenuation measures Install air conditioning	Prior to building construction Prior to occupancy	Applicant Applicant	DPW/DPH DPW/DPH
4.G-4(a) Prior to issuance of building permits, a detailed acoustical analysis study shall be prepared by a qualified acoustical consultant for all on-site single family residences that have rear and/or side yard lines within line-of-site of the proposed school and/or park	Submit a copy of approved Building Plans with note referencing noise attenuation measures	Prior to issuance of building permits	Applicant	DPW/DPH

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
and shall be submitted to the County. This acoustical analysis report shall describe and quantify the noise sources impacting the area. In the event the report shows that noise levels for the residences would exceed applicable standards, measures shall be required to reduce noise to levels that are within applicable standards. Such measures may include: • Locate student pick-up/drop-off and parking areas as far away from residences as feasible; • Arrange school buildings such that they will provide shielding between the play field and the residences; or • Provide acoustical walls with sufficient mass, length and height to break the line-of-sight between the residences and the play field. The acoustical analysis report shall be subject to review and approval by the County and shall ensure compliance with applicable noise standards in the County Code.	Submittal and approval of a detailed acoustical analysis report	Prior to building construction	Applicant	Acoustical consultant/ DPW/DPH
4.G-4(b) Prior to completion of plans for the proposed elementary school and public park, a detailed acoustical analysis report shall be prepared by a qualified acoustical consultant in consultation with the Sulfur Springs School District and the County of Los Angeles Department of Parks and Recreation. The requirements set forth in the report shall ensure that on-site single family residences that have rear and/or side yard lines within line-of-site of the proposed school and/or park are not subject to unacceptably high levels	Submit a copy of approved Building Plans with note referencing noise attenuation measures Submittal and approval of a detailed acoustical analysis report	Prior to construction Prior to completion of plans for proposed elementary school and public park	Applicant Applicant	DPW/DPH DPW/DPH

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
of noise (i.e., noise levels in excess of the standards provided in the County Code) from school yard or park activities. The acoustical analysis report, subject to review and approval by the County, shall include requirements relating to the locations of courts and playfields and the materials and heights of property walls as necessary to support compliance with applicable noise standards in the County Code.				
H. AIR QUALITY				
4.H-1(a): Develop and implement a construction management plan, as approved by the County of Los Angeles prior to issuance of a grading permit, which includes the following measures recommended by the South Coast Air Quality Management District (SCAQMD) to implement SCAQMD Rule 403.	Submittal and approval of a construction management plan	Prior to issuance of grading permit	Applicant	DPW/SCAQMD
	Implement construction management plan	During construction	Applicant	DPW
a. Ground cover shall be replaced in disturbed areas as quickly as practicable; b. Soil stabilizers/dust suppressants shall be applied to inactive disturbed areas in sufficient quantity and frequency to maintain a stabilized surface; c. Haul roads and site access roads shall be watered no less than three times daily; d. Disturbed surfaces shall be watered no less than two times daily; e. All stockpiles shall be covered with tarps as soon as practicable;	Field verification	During construction	Applicant	DRP/DPW

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
f. Travel speed on unpaved surfaces shall not exceed 15 miles per hour;				
g. Provide a publicly visible sign and directly notify property owners in the vicinity of a contact person and telephone number to call regarding dust complaints; the contact person shall respond with appropriate corrective actions within 24 hours;				
h. Prohibit construction vehicle idling in excess of 10 minutes;				
i. Stockpiles, haul routes, staging locations, and parking areas shall be located as far as possible from adjacent residential uses;				
j. Pave or place gravel on all construction access roads at least 100 feet on to the site from the main road;				
k. Configure construction parking to minimize traffic interference;				
l. Provide temporary traffic controls when construction activities have the potential to disrupt traffic to maintain traffic flow (e.g., signage, flag person, detours);				
m. Schedule construction activities that affect traffic flow to off-peak hours (e.g., between 7:00 P.M. and 6:00 A.M. and between 10:00 A.M. and 3:00 P.M.);				
n. Develop a construction traffic management plan that includes the following measures to address				

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
construction traffic that has the potential to affect traffic on public streets: • Consolidate truck deliveries • Provide temporary dedicated turn lanes for movement of construction trucks and equipment on and off of the site; o. Suspend use of all construction equipment operations during second stage smog alerts. Contact the SCAQMD at 800/242-4022 for daily forecasts; p. Use electricity from power poles rather than temporary fossil fuel-powered generators; and q. Use methanol- or natural gas-powered mobile equipment and pile drivers instead of diesel if readily available at competitive prices.				
4.H-1(b): Maintain construction equipment and vehicle engines in good condition and in proper tune as per manufacturers' specifications and per SCAQMD rules, to minimize exhaust emissions.	Submittal and approval of a construction management plan	During construction	Applicant	DPW
4.H-1(c): All on-site heavy-duty construction equipment shall be equipped with diesel particulate traps as feasible.	Submittal and approval of a construction management plan	During construction	Applicant	DPW
4.H-2(a): Subdivisions and buildings will be required to exceed Title 24 of the California Code of Regulations (also known as the California Building Standards Code) 2005 requirements by 15 percent.	Submit a copy of approved Building Plans with note referencing Green Building Ordinance requirements	Prior to issuance of building permits	Applicant	DPW/DRP

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
4.H-2(b): Lighting for public streets, parking areas, and recreation areas shall utilize energy efficient light and mechanical, computerized or photo cell switching devices to reduce unnecessary energy usage.	Submittal and approval of a Lighting Plan with note referencing Green Building Ordinance requirements	Prior to issuance of building permits	Applicant	DPW/DRP
I. WATER RESOURCES				
4.I-1 All appliances such as showerheads, lavatory faucets and sink faucets shall comply with efficiency standards set forth in Title 20, California Administrative Code Section 1604(f). Title 24 of the California Administrative Code Section 1606(b) prohibits the installation of fixtures unless the manufacturer has certified to the California Energy Conservation compliance with the flow rate standards.	Submit a copy of approved Building Plans with note referencing Green Building Ordinance requirements	Prior to issuance of building permits	Applicant	DPW/DRP
4.I-2 Low flush toilets shall be installed as specified in California State Health and Safety Code Section 17921.3 and the County Green Building Ordinance.	Submit a copy of approved Building Plans with note referencing Green Building Ordinance requirements	Prior to issuance of building permits	Applicant	DPW/DRP
4.I-3 All common area irrigation areas shall be capable of being operated by a computerized irrigation system which includes an onsite weather station/ET gage capable of reading current weather data and making automatic adjustments to independent run times for each irrigation valve based on changes in temperature, solar radiation, relative humidity, rain and wind. In addition, the computerized irrigation system shall be equipped with flow sensing capabilities, thus automatically shutting down the irrigation system in	Submittal and approval of a Landscape Plan with note referencing Green Building Ordinance requirements	Prior to issuance of building permits	Applicant	DPW/DRP

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
the event of a mainline break or broken head. All common area irrigation controllers shall also include a rain sensing automatic shutoff.				
4.I-4 Common area landscaping shall emphasize drought-tolerant vegetation. Plants of similar water use shall be grouped to reduce over-irrigation of low-water-using plants. Those areas not designed with drought-tolerant vegetation shall be gauged to receive irrigation using the minimal requirements.	Submittal and approval of a Landscape Plan with note referencing Drought-Tolerant Landscaping Ordinance requirements	Prior to issuance of building permits	Applicant	DPW/DRP
4.I-5 Residential occupants shall be informed as to the benefits of low-water-using landscaping and sources of additional assistance in such.	Provide information to residents	Post occupancy	Applicant	DRP
L. LAW ENFORCEMENT SERVICES				
4.L-1(a): Prior to issuance of building permits, the project shall incorporate Crime Prevention Through Environmental Design (CPTED) features into the project, in coordination with and to the satisfaction of the Sheriff's Department. Such features should include, but are not limited to the following: • Lighting in parking lots and low-level security lighting; • Provision that doors and windows are visible from the street and between buildings; • Lighting of building address numbers to ensure visibility from the street for emergency response agencies; and • Landscaping that would minimize opportunities for hiding.	Submittal and approval of final plans	Prior to issuance of building permits	Applicant	Sheriff's Department

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
4.L-1(b): Prior to issuance of building permits, the applicant shall provide the Sheriff's Department with plans indicating the project's street circulation system and building addresses to facilitate emergency response.	Submittal and approval of final plans	Prior to issuance of building permits	Applicant	Sheriff's Department
M. FIRE SERVICES AND HAZARDS				
4.M-1(a): Prior to issuance of building permits, the applicant shall pay fees pursuant to the Developer Fee Program or make an in-lieu donation, as determined appropriate by the Los Angeles County Fire Department (LACoFD).	Payment of fees or in-lieu donation	Prior to issuance of building permits	Applicant	LACoFD
4.M-1(b): Development of the project shall occur in accordance with all applicable code and ordinance requirements for construction, access, water mains, fire flows, and hydrants.	Submittal and approval of final plans	Prior to issuance of building permits	Applicant	LACoFD
4.M-1(c): Project buildings shall adhere to all applicable State and County Fire and Building Codes.	Submittal and approval of final plans	Prior to issuance of building permits	Applicant	LACoFD
4.M-1(d): The project shall provide adequate emergency access. Access roads shall: • Provide a minimum width of 20 feet; • extend to within 150 feet of any exterior portion of all structures; • meet the minimum width requirements prescribed by the LACoFD; • be constructed with an all-weather surface; • have a minimum of 10 feet of brush clearance on each side;	Submittal and approval of final plans	Prior to issuance of building permits	Applicant	LACoFD

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
• have an unobstructed vertical clearance clear-to-sky with the exception of protected tree species; • have a vertical clearance of 13.5 feet when protected tree species are overhanging; and • have a turning radii of no less than 32 feet.				
4.M-1(e): A turning area satisfactory to the LACoFD shall be provided for all driveways exceeding 150 feet in length and at the end of all cul-de-sacs.	Submittal and approval of final plans	Prior to issuance of building permits	Applicant	LACoFD
4.M-1(f): All fire lanes must be a minimum of 26 feet in width (clear-to-sky) and marked "NO PARKING—FIRE LANE."	Submittal and approval of final plans	Prior to issuance of building permits	Applicant	LACoFD
4.M-1(g): All access devices and gates for the proposed school shall comply with California Code of Regulations, Title 19, Article 3.05, including providing a minimum paved access width of 26 feet for circulation purposes.	Submittal and approval of final plans	Prior to completion of plans for proposed elementary school and public park	Applicant/Sulphur Springs School District	DRP/LACoFD
4.M-1(h): Proposed traffic calming measures shall be submitted to the LACoFD for review and approval.	Submittal and approval of applicable measures	Prior to issuance of building permits	Applicant	LACoFD
4.M-1(i) All fire hydrants shall: • Measure 6"x4" x 2-1/2" brass or bronze, conforming to current AWWA standard C503 or approved equal; • On-site hydrants shall be installed a minimum 25 feet from a structure or protected by a two- hour rated firewall;	Submittal and approval of final plans	Prior to issuance of building permits	Applicant	LACoFD

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
• Fire hydrants shall be installed, tested, and accepted prior to construction; • Vehicular access to fire hydrants shall be provided and maintained serviceable throughout construction.				
4.M-2: Prior to the issuance of any grading permit, a Fuel Modification Plan, consistent with the Fuel Modification Plan Guidelines, shall be submitted for review and approval by the Department of Regional Planning and the Forestry Division of the LACoFD to reduce the threat of wildfire. The Fuel Modification Plan shall require that applicant or homeowners association provide and maintain fuel modification and brush clearance zones around each on-site structure. Said plan shall be approved by the Forestry Division prior to completion of final landscape plans.	Submittal and approval of Fuel Modification Plan	Prior to issuance of grading permit	Applicant	LACoFD/DRP
S. GLOBAL CLIMATE CHANGE				
GHG Reduction Measure GCC-1: The builder shall strive to construct at least 10 percent of dwelling units in the proposed project with LIVINGSMART® features so as to achieve a minimum of 25 percent reduction in projected GHG emissions. The builder commits to offer enhanced advertising, education, and, if needed, other incentives to encourage market acceptance of these various energy- and water-conserving options.	Submit a copy of approved Building Plans with note referencing Green Building Ordinance requirements	Prior to issuance of building permits	Applicant	DPW/DRP

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
GHG Reduction Measure GCC-2: The builder shall plant approximately 40 trees per landscaped acre as a means to capture (sequester) carbon dioxide emissions and to provide shade to the buildings, which can decrease the need for air conditioning.	Submittal and approval of a Landscape Plan with note referencing Green Building Ordinance requirements	Prior to issuance of building permits	Applicant	DPW/DRP
GHG Reduction Measure GCC-3: To facilitate the extension of existing bus service to include Skyline Ranch Road, the builder shall work with the Santa Clarita Transit District to design and provide bus turnouts and shelters along Skyline Ranch Road.	Identify bus stop locations, turnouts, and shelters on final plans	Prior to issuance of building permits	Applicant	Santa Clarita Transit District/DRP
GHG Reduction Measure GCC-4: In order to increase awareness of green building practices and to promote water and energy conservation, the builder will develop and implement a green educational program. The program will include but not necessarily be limited to a pamphlet that educates and promotes conservation practices that homeowners can implement, with specific guidance on landscaping with drought tolerant plants, use of efficient irrigation systems, compact florescent lighting, and other measures that help lower GHG emissions.	Develop and implement green educational program and provide information to residents	Post occupancy	Applicant	DRP

Table 4-1 (Continued)

Skyline Ranch Mitigation Monitoring Program

Mitigation Measures	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
COMPLIANCE				
As a means of ensuring compliance of above mitigation measures, the applicant and subsequent owner(s) are responsible for submitting compliance reports to the Department of Regional Planning for review, and for replenishing the mitigation monitoring account if necessary until all mitigation measures have been implemented and completed.	Submittal and approval of compliance report and replenishing mitigation monitoring account	Yearly and as required	Applicant and subsequent owner(s)	DRP
The subdivision shall conform to the design standards and policies of the Department of Public Works.	Submittal and approval of Public Works Plans	Prior to Final Map Approval	Applicant	DPW/DRP

As the applicant, I agree to incorporate these changes/conditions into the project, and understand that the public hearing and consideration by the Hearing Officer and/or Regional Planning Commission will be on the project as changed/conditioned.

_____ _____

Applicant Signature Date

☐ No response within 10 days. Environmental Determination requires that these changes/conditions be included in the project.

_____ _____

Staff Signature Date

PCR Santa Monica
233 Wilshire Boulevard
Suite 130
Santa Monica, CA 90401
TEL 310.451.4488
FAX 310.451.5279
EMAIL info@pcrnet.com

PCR Irvine
One Venture
Suite 150
Irvine, CA 92618
TEL 949.753.7001
FAX 949.753.7002
EMAIL info@pcrnet.com

PCR Pasadena
55 South Lake Avenue
Suite 215
Pasadena, CA 91101
TEL 626.204.6170
FAX 626.204.6171
EMAIL info@pcrnet.com

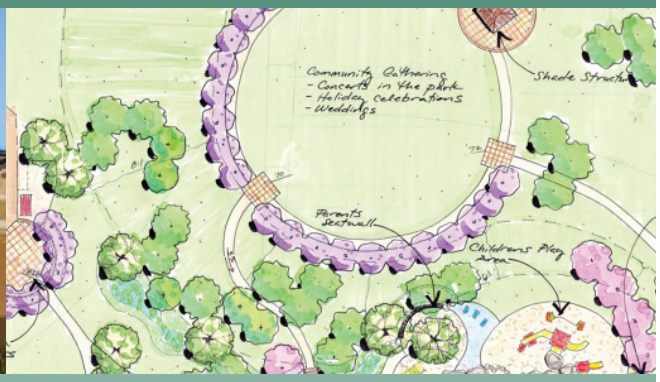
VOLUME II

Technical Appendices

Draft Environmental Impact Report

TR 060922
CUP No. 04-075
Oak Tree Permit No. 04-075

Skyline Ranch Project



County Project No. 04-075
State Clearinghouse No. 2004101090

County of Los Angeles
Department of Regional Planning
Impact Analysis Section
320 West Temple Street
Los Angeles, California 90012-3225

July 2009

VOLUME II

Technical Appendices

Draft Environmental Impact Report

TR 060922
CUP No. 04-075
Oak Tree Permit No. 04-075

Skyline Ranch Project

Prepared by:
PCR Services Corporation
233 Wilshire Boulevard
Santa Monica, California 90401
TEL 310.451.4488
FAX 310.451.5279

County Project No. 04-075
State Clearinghouse No. 2004101090

July 2009

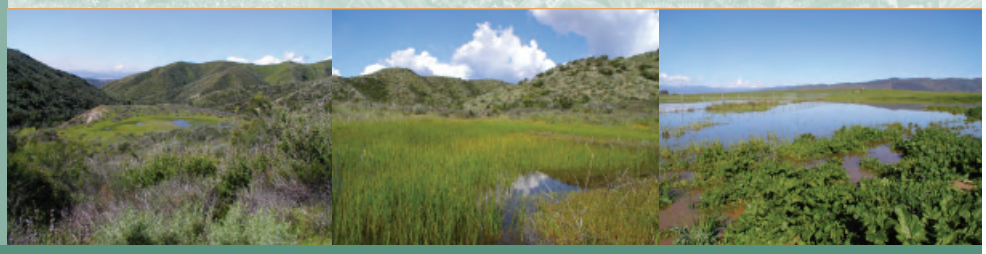
PCR

VOLUME II

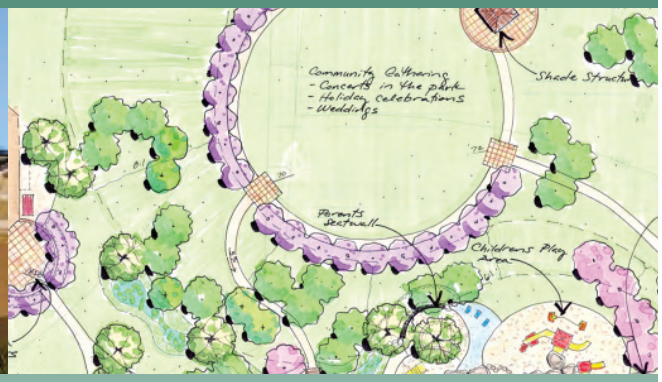
Technical Appendices

Draft Environmental Impact Report

TR 060922
CUP No. 04-075
Oak Tree Permit No. 04-075



Skyline Ranch Project



County Project No. 04-075
State Clearinghouse No. 2004101090

County of Los Angeles
Department of Regional Planning
Impact Analysis Section
320 West Temple Street
Los Angeles, California 90012-3225

July 2009

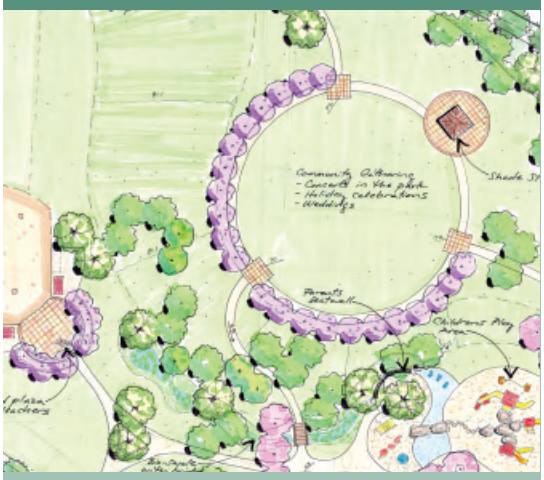
VOLUME II

Technical Appendices

Draft Environmental Impact Report

TR 060922
CUP No. 04-075
Oak Tree Permit No. 04-075

Skyline Ranch Project



Prepared by:
PCR Services Corporation
233 Wilshire Boulevard
Santa Monica, California 90401
TEL 310.451.4488
FAX 310.451.5279

County Project No. 04-075
State Clearinghouse No. 2004101090

July 2009

PCR

TABLE OF CONTENTS

VOLUME I

Page

EXECUTIVE SUMMARY ES-1

1.0 INTRODUCTION 1-1

2.0 PROJECT DESCRIPTION 2-1

3.0 CUMULATIVE IMPACT ANALYSIS METHODOLOGY 3-1

4.0 ENVIRONMENTAL IMPACT ANALYSIS 4-1

A. Geotechnical Resources 4.A-1
B. Hydrology and Water Quality 4.B-1
C. Biological Resources 4.C-1
D. Cultural and Paleontological Resources 4.D-1
E. Visual Qualities 4.E-1
F. Traffic/Access 4.F-1
G. Noise 4.G-1
H. Air Quality 4.H-1
I. Water Resources 4.I-1
J. Wastewater Disposal 4.J-1
K. Solid Waste Disposal 4.K-1
L. Law Enforcement Services 4.L-1
M. Fire Services and Hazards 4.M-1
N. Education 4.N-1
O. Libraries 4.O-1
P. Parks 4.P-1
Q. Land Use 4.Q-1
R. Population, Housing and Employment 4.R-1
S. Global Climate Change 4.S-1

5.0 ALTERNATIVES 5-1

A. Introduction 5-1
B. No Project/No Development Alternative 5-8
C. Reasonably Foreseeable On-Site Development Alternative 5-16
D. Reduced Project A: 800-Residential Lot Alternative 5-30
E. Reduced Project B: 935-Residential Lot Alternative 5-45
F. Comparison of Alternatives and Identification of the Environmentally Superior Alternative 5-58

TABLE OF CONTENTS (CONTINUED)

Page

6.0 OTHER CEQA CONSIDERATIONS 6-1

7.0 LIST OF EIR PREPARERS AND ORGANIZATIONS AND PERSONS CONSULTED 7-1

8.0 REFERENCES 8-1

APPENDICES

VOLUME I

APPENDIX A: NOTICE OF PREPARATION, INITIAL STUDY, AND COMMENT LETTERS; SCOPING MEETING MATERIALS

VOLUME II

APPENDIX B: GEOTECHNICAL REPORTS

VOLUME III

APPENDIX C: HYDROLOGY AND WATER QUALITY TECHNICAL REPORTS

C-1 Hydrology/SUSMP Report
C-2 Flood Plain Analysis
C-3 Water Quality Technical Report
C-4 LID Standards Ordinance Exemption Determination

VOLUME IV

APPENDIX D: BIOLOGICAL RESOURCES TECHNICAL REPORTS

D-1 Biological Resources Assessment
D-2 Conceptual Habitat Mitigation and Monitoring Plan for Impacts to Areas within the Jurisdiction of the U. S. Army Corps of Engineers and the California Department of Fish and Game
D-3 On-Site Jurisdictional Delineation
D-4 Off-Site Jurisdictional Delineation

TABLE OF CONTENTS (CONTINUED)

APPENDIX E: CULTURAL AND PALEONTOLOGICAL RESOURCES REPORTS
E-1 Cultural and Paleontological Resources Assessment
E-2 Addendum Report for Off-Site Storm Drain and Channel

APPENDIX F: TRAFFIC IMPACT ANALYSIS

APPENDIX G: NOISE MODELING WORKSHEETS AND NOISE BARRIER LOCATIONS

VOLUME V

APPENDIX H: AIR QUALITY TECHNICAL APPENDIX
H-1 Project Construction Emissions
H-2 SCAQMD Rule 403
H-3 Project Operation Emissions

APPENDIX I: WATER RESOURCES
I-1 Water Resources Technical Report
I-2 Water Supply Assessment
I-3 Santa Clarita Water Division Correspondence

APPENDIX J: SEWER AREA STUDY REPORT

APPENDIX K: GLOBAL CLIMATE CHANGE
K-1 Construction Greenhouse Gas Emissions
K-2 Operational Greenhouse Gas Emissions
K-3 Greenhouse Gas Reference Material

Appendix A: Notice of Preparation, Initial Study, and Comment Letters; Scoping Meeting Materials

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

James E. Hartl, AICP
Director of Planning

NOTICE OF PREPARATION AND SCOPING MEETING

"The Skyline Ranch Project"

County Project No. 04-075
Tentative Tract Map No. 060922
Oak Tree Permit, Conditional Use Permit, Development Agreement

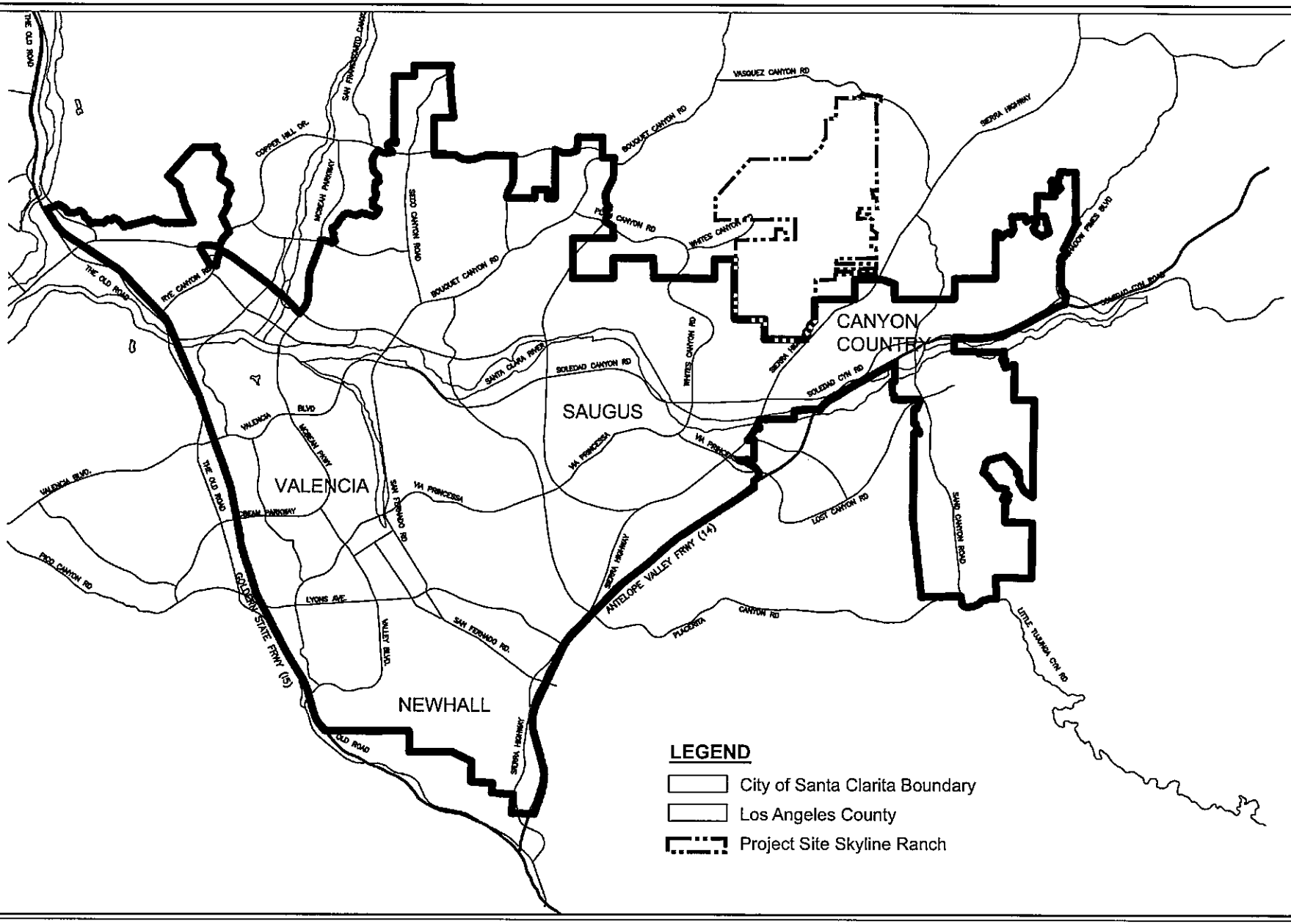
The County of Los Angeles will be the lead agency and will prepare an Environmental Impact Report (EIR) for the project identified above. In compliance with Section 15082 of the CEQA *Guidelines*, the County of Los Angeles is sending this Notice of Preparation to responsible agencies, interested parties and federal agencies which may be involved in approving or permitting the project, and to trustee agencies responsible for natural resources affected by the project. Within 30 days after receiving the Notice of Preparation, each agency shall provide the County of Los Angeles with specific details about the scope and content of the environmental information to be contained in the EIR related to that agency's area of statutory responsibility. In addition to the project actions cited above, permission will be sought for offsite grading on federally owned land managed by the Bureau of Land Management (BLM). Should such offsite grading be determined to be a project subject to the National Environmental Policy Act (NEPA), clearance of that aspect of this project will probably be undertaken separately through an Environmental Assessment (EA) or a joint EIR/EA.

The purpose of this Notice of Preparation 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 may need to use the EIR prepared by our agency when considering your permit or other approval for the project.

PROJECT LOCATION

As shown in Figure 1, the 2,196-acre Skyline Ranch site is located in the Santa Clarita Valley west and north of Highway 14 (Antelope Valley Freeway) and north of the City of Santa Clarita in unincorporated Los Angeles County. The project site includes various parcels west of Mint Canyon between the Santa Clara River and Vasquez Canyon. As illustrated in Figure 2, the site is roughly defined by Sierra Highway (Mint Canyon) on the east and southeast, residential communities on the south and southwest, Plum Canyon Road on the west, Bouquet Canyon Road to the northwest, and Vasquez Canyon Road to the northeast.

ORIGINAL FILED
OCT 22 2004
LOS ANGELES, COUNTY CLERK

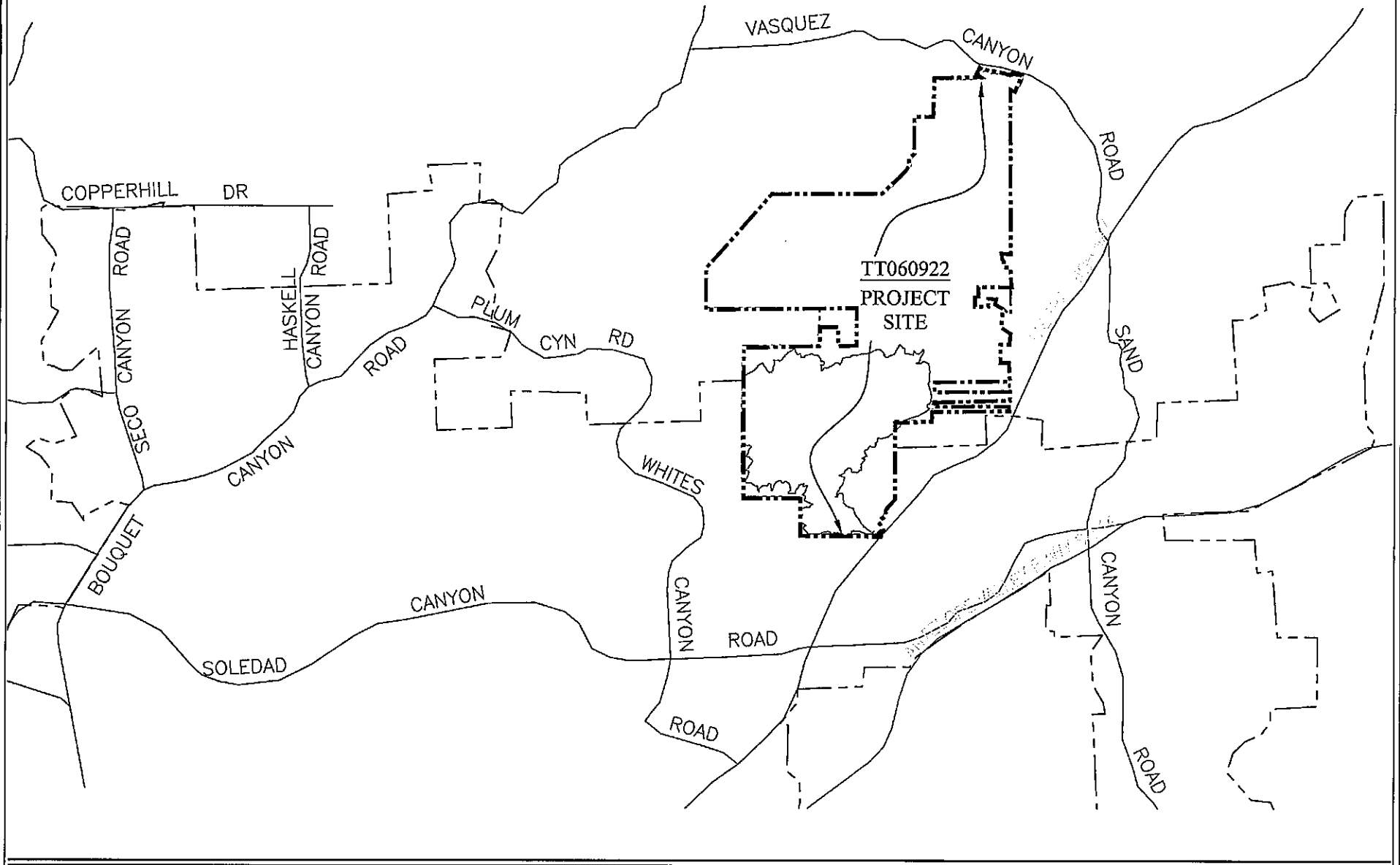


PCR

Not to Scale

Source: Sikand, 2004

Figure 1
Regional Location Map



PCR

Not to Scale

Source: Sikand, 2004

Figure 2
Vicinity Map

EXISTING LAND USE AND ZONING DESIGNATIONS

As shown in Figure 3, the Santa Clarita Valley Area Plan Land Use Policy Map designates the project site as U1 (Urban 1.1 to 3.3 dwelling unit [du]/ acre), U2 (Urban 3.4 to 6.6 du/acre), U3 (Urban 6.7 to 15 du/acre), N (Non-Urban 0.5 to 1.0 du/acre), W (Floodplain), and HM (Hillside Management).

As shown in Figure 4, the County of Los Angeles Zoning Code designates the project site for agricultural uses, including A-2-1 (Heavy Agricultural), and A-1-1 and A-1-10,000 (Light Agricultural).

PROJECT DESCRIPTION

Land Use

The project applicant proposes to develop approximately 592 acres of the site with 1,325 single-family residential lots with pads ranging in size from 4,830 to 7,350 square feet along with a 10-acre school site and approximately 10 acres of public park land. Development is proposed for the southern portion of the property where slopes of 25 percent or less are located. The northern 1,604 acres of the site would remain preserved as open space and managed by an as yet to be determined entity. A copy of the map is included as Figure 5.

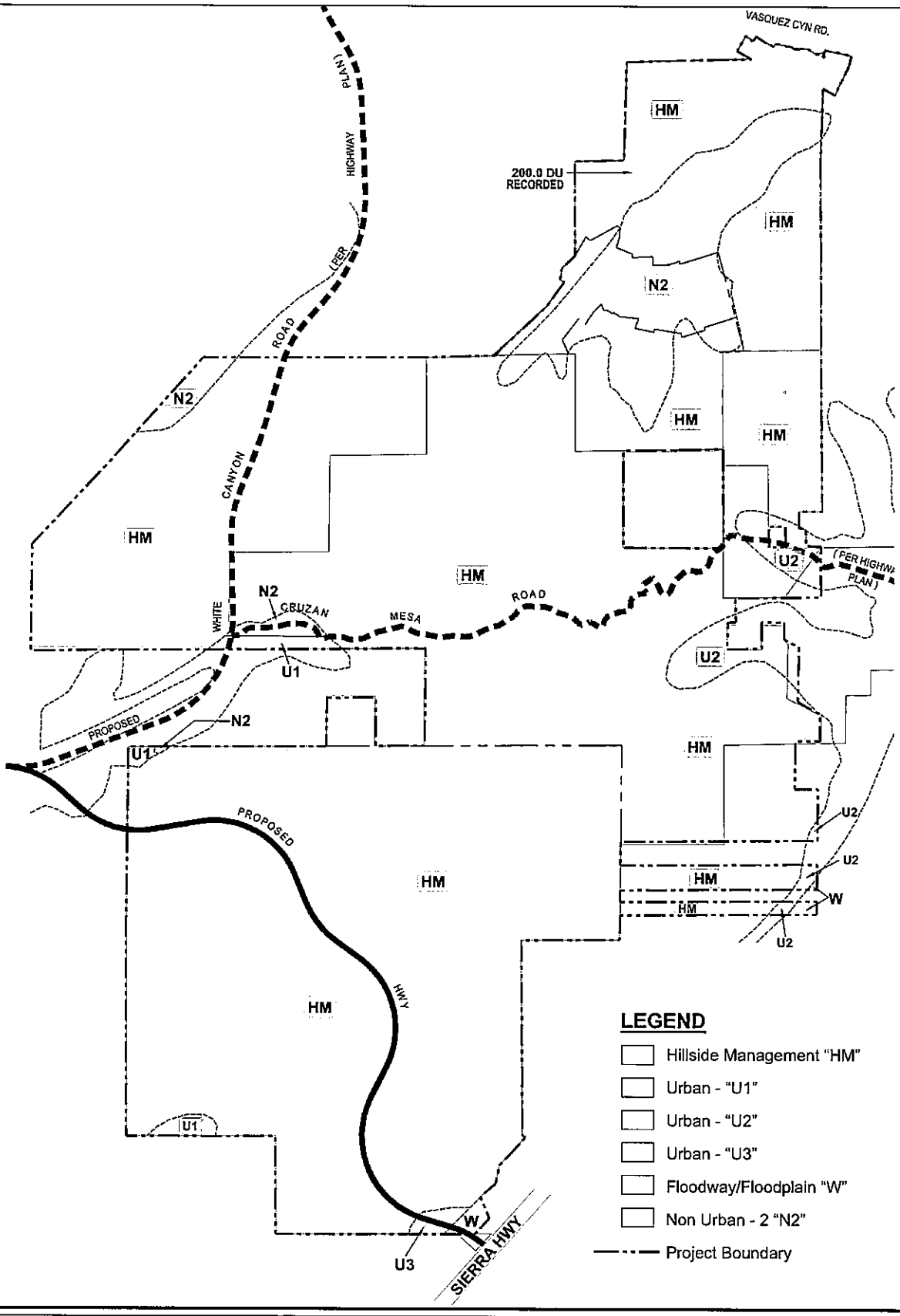
Grading

Grading and associated earthwork would require the movement of approximately 20 million cubic yards of earth (cut/fill) that would occur exclusively on the southern 592 acres of the 2,196-acre site and immediately adjacent properties to the southeast and west for project access. Approximately 32 percent of the grading would be associated with a proposed off- and on-site public street improvement to extend Whites Canyon Road to the project site. Within the 592 acre portion of the property, mass grading would take place to provide for major roads and infrastructure, establish drainage patterns and for creation of building pads for the various land uses within the project.

The overall grading and earthwork proposal includes approximately 10.54 acres off-site associated with the extension of Whites Canyon Road to Plum Canyon Road. For approximately 1.42 acres of this off-site area, permission will be sought to undertake grading on land owned by the Federal government. Approximately 65,000 cubic yards of fill would be placed on this property with a maximum fill depth of 100 feet.

Infrastructure

The project will construct a network of collector roads to provide local access to land uses associated with the proposed project. Primary access to the tract is provided by the off-site extension of Whites Canyon Road from Plum Canyon on the west (through Tract Map No. 46018), through the project site as Skyline Ranch Road, ultimately connecting to Sierra Highway in the southeast. This roadway is planned for two travel lanes in each direction separated by a center median and containing landscaped parkways of variable width within a 100-foot right-of-way. Local roadways would extend off Whites Canyon Road within a 50-foot right of way. All roadways within the project site will be constructed to urban standards as defined by the County of Los Angeles Department of Public Works.

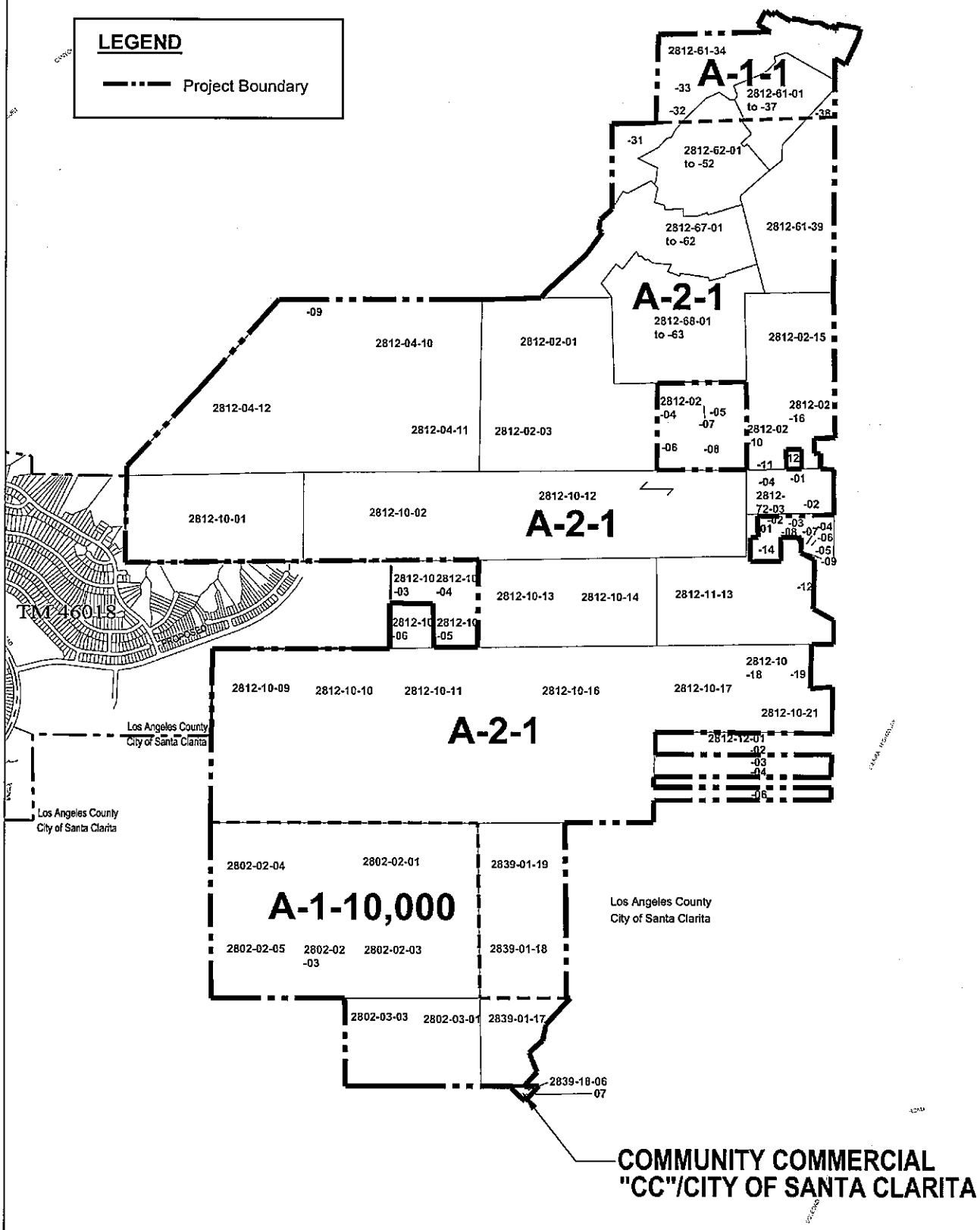


PCR

Not to scale

Source: Sikand, 2004

Figure 3
Existing General Plan Designation

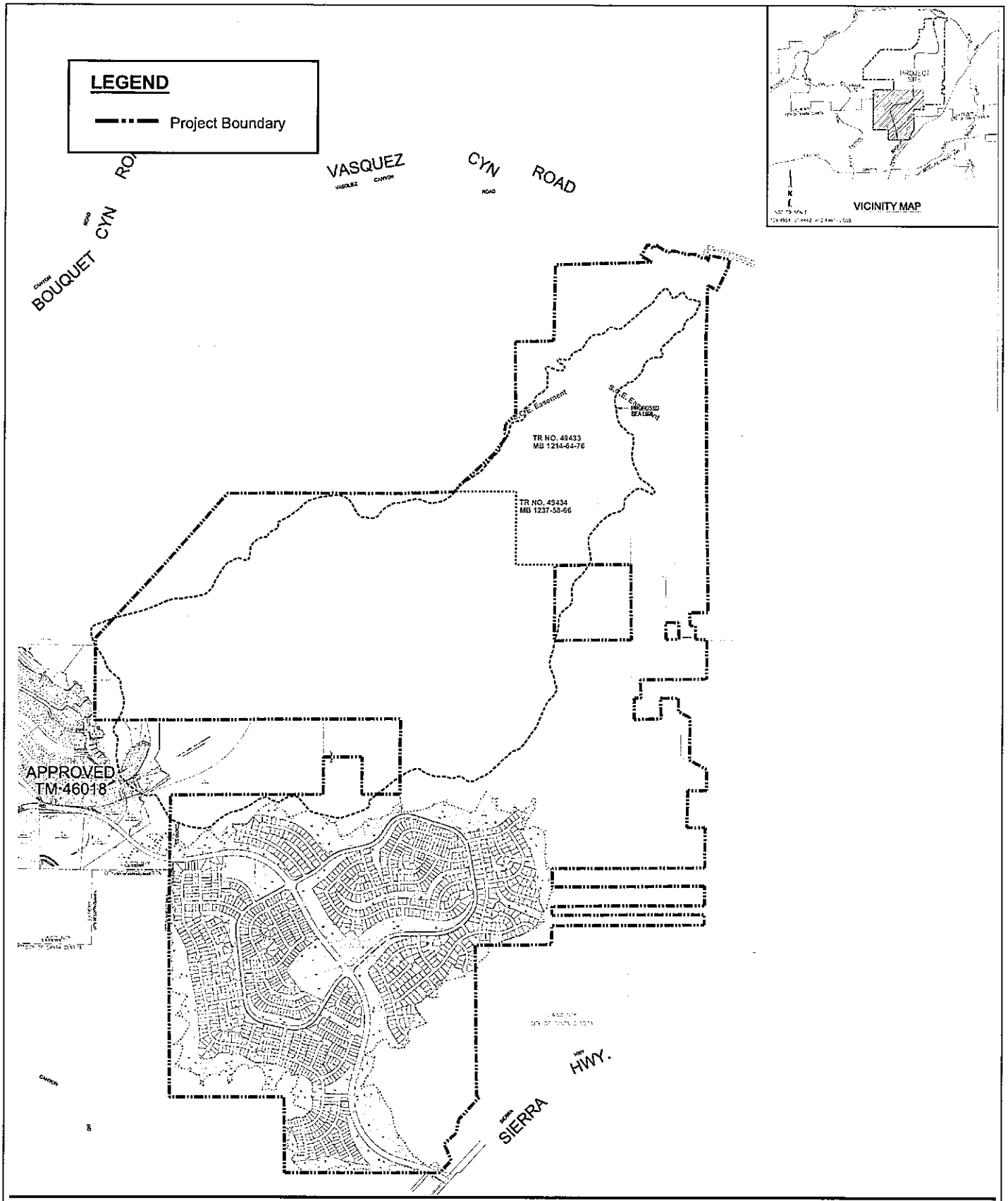


PCR

Not to scale

Source: Sikand, 2004

Figure 4
Zoning Map



PCR

Not to scale

Source: Sikand, 2004

Figure 5
Vesting Tentative Tract No. 060922

A system of landscaped trails and walkways, called paseos, is proposed to provide a safe and attractive means of pedestrian access from residential neighborhoods to the elementary school and park sites. The paseos would adjoin Skyline Ranch Road and certain residential collector streets, and would be separated from vehicular traffic.

On-site surface run-off would be intercepted by curb, debris, and/or desilting inlets and conveyed to a network of storm drains that lead to a series of treatment structures including water quality basins prior to discharge into the existing storm drain network serving nearby developed uses.

Wastewater would be collected and conveyed by a gravity flow network of pipes placed beneath on-site roadways. The sewer collector lines serving the site will connect to a sewer trunk main that extends along Sierra Highway.

The site is currently located in an area served by both the Santa Clarita Water Division (SCWD) and the Newhall County Water District. However, detachment from the Newhall County Water District is proposed as part of the project since the SCWD has existing distribution infrastructure in place that can more feasibly serve the project. In order to provide sufficient amounts of water and adequate water pressure to the project, a series of water storage reservoirs are proposed within two on-site water zones. Potable water would be conveyed to on-site uses via a network of 6" to 12" pipes that are located primarily beneath the planned roadway alignments.

DISCRETIONARY ACTIONS REQUESTED

Actions from the County of Los Angeles Department of Regional Planning needed to develop the property as proposed include: 1) Vesting Tentative Tract Map No. 060922; 2) Conditional Use Permit (04-075) for a Residential Planned Development, development in a Hillside Management Area, and for the movement of more than 100,000 cubic yards of earth; 3) Oak Tree Permit (04-075) for removal of one oak tree; and 4) a Development Agreement (04-075) with the County of Los Angeles. Among actions being sought from other agencies, detachment from the Newhall County Water District and annexation to the SCWD is proposed.

ENVIRONMENTAL SETTING/POTENTIAL ENVIRONMENTAL ISSUES

Topography consists of modest- to steep-sloped ridgelines and canyons. The site drains to the west and southwest into the Santa Clara River basin. The terrain is generally rugged, but has few exposed rock outcroppings. South of Plum Canyon, the terrain rises gently from southwest to northeast where it joins the pass at the headwaters of Plum Canyon. North of Plum Canyon is a series of side canyons and associated slopes and ridges. These ridges slope southwestward from Cruzan Mesa and northward into Vasquez and Bouquet Canyons farther to the north.

The site has no active land uses other than on Cruzan Mesa. The northern portion of Cruzan Mesa is currently being leased by SLS Film Works as an outdoor movie location. Portions of Cruzan Mesa have been used for cattle grazing and are the site of a sizable vernal pool. Land ownership of the entire Skyline Ranch site is in private holdings. Recorded Tract Map No. 44967 of 200 lots on 360 acres is included within the northern boundary of this project.

The Skyline Ranch site supports seven vegetation communities as classified by Holland (1986): non-native grassland, coastal sage scrub, chaparral, coastal sage–chaparral scrub, holly-leaved cherry scrub, vernal pool, sycamore riparian woodland, and highly disturbed areas, with minor elements of other plant communities present. The dominant communities on the site are coastal

sage scrub and coastal sage–chaparral scrub, with the former best represented on south-facing slopes and ridgelines and the latter mostly on north-facing slopes. True chaparral with scrub oaks is restricted primarily to shaded north-facing slopes in the northern portion of the project site. Non-native grassland predominates on mesas, ridgelines, and gentler south-facing slopes, but as with chaparral, in many areas it is transitional with coastal sage scrub and clearly represents an early stage of sage scrub following past soil disturbance.

Wildlife diversity on the site is moderate, commensurate with the rather homogeneous nature of the sage scrub and grassland-covered slopes and ridges that comprise most of the site. The highest diversity occurs in Plum Canyon and an unnamed canyon to the southwest, which have the best developed plant community structure and greatest diversity of habitat types. Cruzan Mesa, the northern portion of the 1,604 acres of the project site proposed to remain preserved as open space, has seasonal pools and extensive grassland, offers additional habitat for a different array of species, and the long escarpment along the northern end of this area provides nesting habitat for several species of raptors. The pools also offer resting and foraging habitat for a number of migratory waterfowl and shorebirds in the spring and early summer. Biological survey data from 2002 and 2003 confirmed the presence of four plant species and twelve wildlife species that are recognized as regionally or locally "sensitive", but are not federally or State-listed.

The Los Angeles County Department of Regional Planning prepared an Initial Study for the Skyline Ranch project and determined that a project EIR is required. A copy of the Initial Study is included as an attachment to this NOP.

The attached Initial Study was prepared pursuant to CEQA Guidelines §15063 and provides a preliminary analysis of the potential environmental effects to be analyzed in the Project EIR. The Initial Study provides a description of the project, including the location; a description of the environmental setting; and an identification of the project's potential environmental effects relative to hazards (geotechnical, flood, fire and noise); resources (water quality, air quality, biota, cultural resources and visual resources/aesthetics), services (traffic/access, sewage disposal, education, fire/sheriff and utilities) and other potential impact categories (general, environmental safety/hazardous materials, land use, population/housing/employment and mandatory findings of significance).

Based on the preliminary analysis, the Initial Study determined that the project may have potentially significant effects relative to the various impact categories, including: hazards (geotechnical, flood, fire and noise), resources (water quality, air quality, biota, cultural resources, and visual resources/aesthetics), services (traffic/access, sewage disposal, education, fire/sheriff and utilities) and other (general, environmental safety/hazardous materials, land use and recreation).

SCOPING MEETING

To assist in local participation, a Scoping Meeting will be held to present the proposed project and to solicit suggestions from the public and responsible agencies on the content of the Draft EIR. This meeting will be held in the Canyon Country Joanne Darcy Library located at 18536 Soledad Canyon Road, Santa Clarita, CA 91351 on November 10th, 2004 from 6:00 p.m. to 8:00 p.m.

NOTICE OF PREPARATION REVIEW AND COMMENTS

The review period for the Notice of Preparation will be from October 25 to November 24, 2004. Copies of the NOP are available for review at Canyon Country Library located at 18536 Soledad Canyon Road, Santa Clarita, CA 91351; Valencia County Library at 23743 West Valencia Boulevard, Santa Clarita, CA 91355; Newhall County Library at 22704 West 9th Street, Santa Clarita, CA 91321; as well as at the Department of Regional Planning, at the address below, and its website http://planning.co.la.ca.us/drp_agnd.html Tentative Tract Map No. 060922. Due to the time limits mandated by State law, your response must be sent at the earliest possible date, but not later than November 30, 2004. Please direct all written comments to the following address. In your written response, please include the name of a contact person in your agency.

Dr. Hsiao-ching Chen, AICP
Los Angeles County Regional Planning Department
Impact Analysis Section
320 West Temple Street, Room 1348
Los Angeles, CA 90012
Tel (213) 974-6461
Fax (213) 626-0434

NOTICE OF CORRECTION

ADDITIONAL PROJECT INFORMATION TO BE INCLUDED IN THE NOTICE OF PREPARATION

The "Skyline Ranch" Project

County Project No. 04-075
Oak Tree Permit, Conditional Use Permit, Development Agreement
Tentative Tract Map No. 060922

The Notice of Preparation (NOP) distributed on October 25, 2004 regarding the above-referenced project failed to include a copy of the Initial Study prepared by the County of Los Angeles Department of Regional Planning. We apologize for this oversight. A copy of the Initial Study is attached for your review.

Please direct any questions concerning this matter or the project to:

Dr. Hsiao-ching Chen, AICP
Impact Analysis Section
Los Angeles County, Department of Regional Planning
320 W. Temple Street, Room 1348
Los Angeles, CA 90012
Telephone: (213) 974-6461
Fax: (213) 626-0434

STAFF USE ONLY

PROJECT NUMBER: *04-075*

CASES: *TR 060922*

CP, ZC, PA

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

COUNTY OF LOS ANGELES
DEPARTMENT OF REGIONAL PLANNING

GENERAL INFORMATION

I.A. Map Date: *March 8, 2004* Staff Member: *Hsiao-ching Chen*

Thomas Guide: *4551 H,J-1; 4461 H,J1-6; 4462 A 1-7, B1-6* USGS Quad: *Mint Canyon*

Location: *West of Mint Canyon and Sierra Highway between the Santa Clara River and Vasquez Canyon Road, Canyon Country*

Description of Project: *This application is a request for a Tentative Tract Map and a Conditional Use Permit for hillside development to subdivide into 1,343 single-family lots, a 10-acre school site, 9 acres of park lands, and an open space area of 1,604 acres. Approximately 306 acres of the site contains previously approved and recorded tract maps (i.e., Tracts 49433, 49434, 44967). Requests for ZC, PA, and OTP are uncertain and to be determined by staff.*

Gross Area: *2,196 acres*

Environmental Setting: *The project site is located in the upper Santa Clarita Valley north and west of Highway 14 and north of the City of Santa Clarita in the unincorporated Los Angeles County. Plum Canyon is the major drainage on-site and runs east-west, ultimately draining into Bouquet Canyon west of the site. Topography consists of modest to steep ridgelines and canyons covered with low scrub and grasslands with scattered trees and tall scrub in the larger canyons. Northern portion of the site is currently being leased as an outdoor movie set on the previously recorded tracts area and another portion site has been used for cattle grazing. Surrounding land uses include existing, approved, and proposed residential communities and vacant land.*

Zoning: *A-2-1, A-1-1, A-1- 10,000*

General Plan: *Non-urban*

Community/Area Wide Plan: *U1, U2, U3, N, W, HM (SCVAP)*

Major projects in area:

Project Number	Description & Status
CP 03-074	*Condominium (12/ 2003 approved)*
85-628/TR46018	*(TN) 1309 lots on 603 AC (1/31/89 partially recorded)*
04-124/ TR060999	*45 SF and 1 Open Space (pending)*
04-102/ TR46018	*4 SF, 5MF, 1 Fire Station, 1 Park, 3 Open Space (Revised Map-pending)*
00-187/TR 52763	*11 SF and 1 Open Space (pending)*
86-441/ TR44967	*(TN) 202 SF, 4 OS, 2 PF LOTS ON 360 AC (recorded 5/12/99)*

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
- ☐ CA Dept of Health Services
- ☒ Army Corps of Engineers
- ☒ *CA Integ. Waste Mgt Board*
- ☒ *Caltrans*

Trustee Agencies

- ☐ None
- ☒ State Fish and Game
- ☒ State Parks
- ☒ *USFWS*
- ☐ _____

Special Reviewing Agencies

- ☐ None
- ☒ Santa Monica Mountains Conservancy
- ☐ National Parks
- ☐ National Forest
- ☐ Edwards Air Force Base
- ☐ Resource Conservation District of the Santa Monica Mtns.
- ☒ *Air Resources Board*
- ☒ *AQMD, SCAG, DTSC*
- ☒ *City of Santa Clarita*
- ☒ *W S Hart USD, Saugus SD*
- ☒ *Sulphur Springs Union SD*
- ☒ *Newhall County Water Dist.*
- ☒ *CA WaterImpact Network*
- ☒ *SC Valley Historical Society*

Regional Significance

- ☐ None
- ☒ SCAG Criteria
- ☒ Air Quality
- ☒ Water Resources

County Reviewing Agencies

- ☒ Subdivision Committee
- ☒ DPW: *Traffic & Lighting; Env Programs; Land Dev, Geo & Materials, Waterworks, Watershed Mgt,*
- ☒ Health Services: *Env Protection, Solid Waste Mgt Programs*
- ☒ *Sanitation Districts*
- ☒ *Fire, Sheriff, Library*
- ☒ *Parks & Recreation*
- ☐ _____

IMPACT ANALYSIS MATRIX

CATEGORY	FACTOR	Pg	No Additional Analysis	Addendum EIR/ND	Subsequent/Supplemental EIR	Potential Concern
HAZARDS	1. Geotechnical	5	☐	☐	☒	*Seismic hazard, landslide, substantial grading*
	2. Flood	6	☐	☐	☒	*Plum Canyon*
	3. Fire	7	☐	☐	☒	*Fire Zone 4, Water supply for fire fighting purposes*
	4. Noise	8	☐	☐	☒	*Construction noise on surrounding residential uses*
RESOURCES	1. Water Quality	9	☐	☐	☒	*NPDES compliance*
	2. Air Quality	10	☐	☐	☒	*Project exceeds regional threshold*
	3. Biota	11	☐	☐	☒	*vernal pools, coastal sage scrub, sycamore riparian habitat*
	4. Cultural Resources	12	☐	☐	☒	*Oak, drainage course, undisturbed land*
	5. Mineral Resources	13	☒	☐	☐	
	6. Agriculture Resources	14	☒	☐	☐	
	7. Visual Qualities	15	☐	☐	☒	*Landform alteration*
SERVICES	1. Traffic/Access	16	☐	☐	☒	*Project exceeds CMP thresholds*
	2. Sewage Disposal	17	☐	☐	☒	*No existing services available*
	3. Education	18	☐	☐	☒	*Existing district/school exceeds current capacity*
	4. Fire/Sheriff	19	☐	☐	☒	*Nearest fire/sheriff unable to respond in time*
	5. Utilities	20	☐	☐	☒	*All utility supplies including water*
OTHER	1. General	21	☐	☐	☒	*Water supply, solid waste facility near capacity*
	2. Environmental Safety	22	☐	☐	☒	*Phase I Env Assessment is required*
	3. Land Use	23	☐	☐	☒	*Plan Amendment, Zone Change, Hillside development*
	4. Pop./Hous./Emp./Rec.	24	☐	☐	☒	*Increased demand for recreational facility*
	Mandatory Findings	25	☐	☐	☒	*Biota, Traffic, Water Quality, Air Quality*

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: *Non-urban hillside, other non-urban and agricultral*
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: *4/28/04*

☐ 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."

☐ On the basis of substantial evidence in the light of the whole record, there are substantial changes in project as well as with respect to the circumstances under which the project is undertaken. A Subsequent EIR is to be prepared pursuant to CEQA Guidelines Section 15162.

Reviewed by: *Hsiao-ching Chen* Date: _____

Approved by: *Daryl Koutnik* Date: 5 MAY 2004

☐ 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? *Portion of the site is close to Mint Canyon Fault (LA Co Safety Element Plate 1); Earthquake-induced landslides and liquefaction areas (Seismic Hazard Zones Map Mint Canyon Quad.)*
b.	☒	☐	☐	Is the project site located in an area containing a major landslide(s)? *Earthquake-induced landslides (Seismic Hazard Zones Map Mint Canyon Quad.)*
c.	☒	☐	☐	Is the project site located in an area having high slope instability? *Grading and construction within hillside area.*
d.	☒	☐	☐	Is the project site subject to high subsidence, high groundwater level, liquefaction, or hydrocompaction? *Liquefaction areas (Seismic Hazard Zones Map Mint Canyon Quad.)*
e.	☒	☐	☐	Is the proposed project considered a sensitive use (school, hospital, public assembly site) located in close proximity to a significant geotechnical hazard? *Project contains a propsoed school site.*
f.	☒	☐	☐	Will the project entail substantial grading and/or alteration of topography including slopes of more than 25%? *Substantial grading in hillside area*
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? *Plum Canyon*
b.	☒	☐	☐	Is the project site located within or does it contain a floodway, floodplain, or designated flood hazard zone? *Plum Canyon*
c.	☐	☐	☒	Is the project site located in or subject to high mudflow conditions? *Construction on hillside area*
d.	☐	☐	☒	Could the project contribute or be subject to high erosion and debris deposition from run off? *Construction on hillside area*
e.	☒	☐	☐	Would the project substantially alter the existing drainage pattern of the site or area? *Topography to be significantly altered although not directly in main Plum Canyon*
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)? *Fire Zone 4 (LA County Safety Element Plate 7)*
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?
d.	☐	☐	☒	Is the project site located in an area having inadequate water and pressure to meet fire flow standards? *No water currently available*
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)?
b.	☒	☐	☐	Is the proposed use considered sensitive (school, hospital, senior citizen facility) or are there other sensitive uses in close proximity? *Project contains a propsoed school site.*
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? *Site is currently undeveloped*
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? *During project preparation and construction, truck trips may travel through existing residential communities or affect exisiting surrounding residential uses.*
e.	☐	☐	☐	Other factors?

STANDARD CODE REQUIREMENTS

☒ Noise Ordinance No. 11,778 ☐ 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?
	☐	☐	☐	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? *NPDES compliance required.*
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 compliance 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)? *Project contains 1,341 units of single family units and one school site.*
b.	☒	☐	☐	Is the proposal considered a sensitive use (schools, hospitals, parks) and located near a freeway or heavy industrial use? *Project contains a proposed school site.*
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? *Project is likely to exceed AQMD thresholds of significance due to its large size.*
d.	☐	☒	☐	Will the project generate or is the site in close proximity to sources which create obnoxious odors, dust, and/or hazardous emissions?
e.	☐	☐	☒	Would the project conflict with or obstruct implementation of the applicable air quality plan? *Project is a non-attainment area.*
f.	☐	☐	☒	Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation? *Construction activities could exceed Nox threshold.*
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)? *ROG, NOx, PM10*
h.	☒	☐	☐	Other factors: *Site is located within a non-attainment air quality district.*

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? *Portion of the site is within the proposed Crezan Mesa SEA; Site is relatively undisturbed*
b.	☒	☐	☐	Will grading, fire clearance, or flood related improvements remove substantial natural habitat areas? *Site is relatively undisturbed*
c.	☒	☐	☐	Is a major drainage course, as identified on USGS quad sheets by a blue, dashed line, located on the project site? *Plum Canyon and its unnamed tributary drainage.*
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.)? *Cruzan Mesa and Plum Canyon vernal pools, coastal sage scrub, holly-leaved cherry scrub, sycamore riparian woodland, chaparral*
e.	☒	☐	☐	Does the project site contain oak or other unique native trees (specify kinds of trees)? *Site contains one mature coast live oak (Quercus agrifolia) tree and Sycamore*
f.	☒	☐	☐	Is the project site habitat for any known sensitive species (federal or state listed endangered, etc.)? *California Orcutt, spreading navarretia, slender mariposa lily, Peirson's Morning-glory, Palmer's Grappling Hook, California gnatcatcher, white-tailed kite, nothern harrier, golden eagle, prairie falcon, ashy rufous-crowned sparrow, Bell's sage sparrow, widespread Pacific treefrog, western spadefoot, coast horned lizard, vernal pool fairy shrimp, coastal whiptail, and southern rattlesnake.*
g.	☐	☐	☐	Other factors (e.g., wildlife corridor, adjacent open space linkage)? _____

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

☐ Lot Size ☒ Project Design ☒ Oak Tree Permit ☒ SEATAC Review

Biological Resources Constraints dated March 2004 by Natural Resource Consultant on file.

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? *Plum Canyon, one oak tree*
b.	☐	☒	☐	Does the project site contain rock formations indicating potential paleontological resources?
c.	☐	☒	☐	Does the project site contain known historic structures or sites? *Site is currently vacant*
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?
f.	☐	☐	☐	Other factors?

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

☐ Lot Size ☐ Project Design ☒ Phase I Archaeology Report

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? *Per 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? *Soledad Canyon Road is Santa Clarita is a secondary scenic highway.*
b.	☐	☐	☒	Is the project substantially visible from or will it obstruct views from a regional riding or hiking trail? *Mint Canyon and Bouquet Canyon Trails are in the close area (per LA County Trail System Map)*
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?
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)? *Project is proposing 1,341 SF units and 1 school site; many intersections in Santa Clarita near capacity.*
b.	☐	☒	☐	Will the project result in any hazardous traffic conditions?
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?
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? *Project exceeds CMP threshold for single family residential projects.*
f.	☐	☒	☐	Would the project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?
g.	☐	☐	☐	Other factors?

☒ **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? *Per application, the project will be annexed to the LA County Sanitation District No. 26, within which the current demand exceeds design capacity.*
b.	☒	☐	☐	Could the project create capacity problems in the sewer lines serving the project site? *Community sewage system for the site currently unavailable. Project will require existing sewer lines to be extended.*
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? *Sulphur Springs, Saugus, and William S. Hart School Districts are currently over capacity.*
b.	☒	☐	☐	Could the project create capacity problems at individual schools which will serve the project site? *Individual schools within the above three school districts are currently operating over capacity.*
c.	☒	☐	☐	Could the project create student transportation problems? *Students may be transferred to other schools not in the immediate vicinity.*
d.	☒	☐	☐	Could the project create substantial library impacts due to increased population and demand? *Project will increase demand for library services by 8,287 volumes and 1,612 square feet to a total of 129,600 volumes and 25,207 square feet respectively, compared to current supply of 66,790 volumes and 5,050 square feet. Project will result in significant impacts on project level as well as on a cumulative basis.*
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 impact

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? *The nearest fire station Fire Engine 107 is located at 18239 Soledad Canyon Road, Canyon County, which is approximately 4.5 miles from site; Project site is within the service area of the Santa Clarita Sheriff Station, which is located approxinmately 10.3 miles from the site at 23740 West Magic Mountain Parkway in Valencia.*
b.	☐	☒	☐	Are there any special fire or law enforcement problems associated with the project or the general area? *Site is currently undeveloped.*
c.	☐	☐	☐	Other factors?

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

☒ Fire Mitigation Fees

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? *Dispute in known available water supplies*
b.	☐	☒	☐	Is the project site in an area known to have an inadequate water supply and/or pressure to meet fire fighting needs?
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)? *Countywide solid waste facilities are reaching capacity.*
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? *Project is required to perform a mandatory water assessment.*

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? *Site is currently undeveloped.*
c.	☐	☒	☐	Will the project result in a significant reduction in the amount of agricultural land?
d.	☐	☐	☐	Other factors?

STANDARD CODE REQUIREMENTS

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

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

☐ Lot size ☐ Project Design ☐ Compatible Use

To be discussed in conjunction with "Land Use," "Visual," and other factors.

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? *Project is proposing a school on-site*
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**

☒ A Phase I Environmental Assessment to be performed to demonstrate no possible soil toxicity.

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? *Project may require a Plan Amendment*
b.	☒	☐	☐	Can the project be found to be inconsistent with the zoning designation of the subject property? *Project may require a Zone Change.*
c.				Can the project be found to be inconsistent with the following applicable land use criteria:
	☒	☐	☐	Hillside Management Criteria?
	☐	☐	☒	SEA Conformance Criteria? *Site is within the proposed Cruzan Mesa SEA.*
	☐	☐	☐	Other?
d.	☐	☒	☐	Would the project physically divide an established community?
e.	☒	☐	☐	Other factors? *One of the two project main access connects to a road extending from west of a pending Tract Map (Project No. 04-102/TR 46018-Revsied) not yet approved and recorded. This uncertainity leads to possible design alteration until TR 46018 is approved and recorded.*

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

Land use consistency analysis.

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)? *Site is currently undeveloped.*
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? *Demand for recreation facilities from 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, education, air quality, sewer treatment*
c.	☒	☐	☐	Will the environmental effects of the project cause substantial adverse effects on human beings, either directly or indirectly? *Air quality, water quality*

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

URBAN SERVICES ANALYSIS

PROJECT NO. 04-075

CASE NO: TR060922

SEWER TREATMENT CAPACITY ANALYSIS

(MILLION GALLONS PER DAY)

4/28/2004

SEWER AGENCY	EXISTING DEMAND	RECORDED	APPROVED	PENDING	PROJECT	TOTAL	SUPPLY	POTENTIAL SIGNIFICANT IMPACT
S.D. NO. 26 & 32	15.04	3.42	3.21	3.01	0.35	25.03	19.10	YES

PLANNED EXPANSION

SEWER AGENCY	TOTAL CAPACITY	COMPLETION EXPECTED	POTENTIAL SIGNIFICANT IMPACT
S.D. NO. 26 & 32			
FIRST STAGE	28.10	2002	NO
PRACTICAL SITE CAPACITY:	34.10	2010	NO

CRITERIA

DEMAND FACTORS (GAL/DAY):	SF	MF	MH	COMMERCIAL (PER ACRE)	INDUSTRIAL (PER ACRE)
S.D. NO. 26 & 32	260	195	156	1,440	2,009

URBAN SERVICES ANALYSIS

LIBRARY CAPACITY ANALYSIS

PROJECT NO 04-075
CASE NO. TR060922

4/28/2004

LIBRARY	EXISTING DEMAND	DEMAND POTENTIAL RECORDED	APPROVED	PENDING	PROJECT	TOTAL	SUPPLY	POTENITAL SIGNIFICANT IMPACT
CANYON COUNTRY								
VOLUMES	64,408	13,571	28,236	15,098	8,287	129,600	66,790	YES
SPACE (SQ FT)	12,527	2,640	5,492	2,937	1,612	25,207	5,050	YES
-AREA CLUSTER-*								
VOLUMES	320,598	82,886	76,886	62,659	8,287	551,316	348,467	YES
SPACE (SQ FT)	62,356	16,121	14,954	12,187	1,612	107,231	67,777	YES

* AREA CLUSTER IS THE GROUP OF LIBRARIES SERVING THE ENTIRE COMMUNITY.

	CRITERIA
VOLUMES PER CAPITA:	2
SQUARE FOOT PER CAPITA:	0.389

PROJECT NO. 04-075
CASE NO. TR060922

URBAN SERVICES ANALYSIS

SCHOOL CAPACITY ANALYSIS

4/28/2004

STUDENT EVALUATION

SCHOOL DISTRICT	ENROLLMENT	PENDING	APPROVED	RECORDED	PROJECT	TOTAL	CAPACITY	STUDENT OVERLOAD	POTENTIAL SIGNIFICANT IMPACT
SULPHUR SPRINGS	4,662	586	801	802	534	7,385	4,975	2,410	YES
WM.S. HART JR HI	5,217	541	852	793	134	7,537	5,174	2,363	YES
WM.S. HART SR HI	9,903	1,468	1,778	1,973	252	15,374	9,512	5,862	YES

PROJECT NO. 04-075
CASE NO. TR060922

URBAN SERVICES ANALYSIS

SCHOOL CAPACITY ANALYSIS

4/28/2004

STUDENT EVALUATION

SCHOOL DISTRICT	ENROLLMENT	PENDING	APPROVED	RECORDED	PROJECT	TOTAL	CAPACITY	STUDENT OVERLOAD	POTENTIAL SIGNIFICANT IMPACT
SAUGUS UNION	8,979	533	1,970	1,421	467	13,370	7,579	5,791	YES
WM.S. HART JR HI	5,217	541	852	793	134	7,537	5,174	2,363	YES
WM.S. HART SR HI	9,903	1,468	1,778	1,973	252	15,374	9,512	5,862	YES

PROJECT NO. 04-075

CASE NO. TR060922

URBAN SERVICES ANALYSIS
WATER CAPACITY ANALYSIS

4/28/2004

WATER AVAILABILITY EVALUATION

(ACRE-FEET/YEAR)

WATER COMPANY	EXISTING DEMAND	DEMAND POTENTIAL RECORDED	APPROVED	PENDING	PROJECT	TOTAL	DRY SUPPLY	NORMAL SUPPLY	OTENTIAL SIGNIFICANT IMPACT
NEWHALL WD	9,348	1,469.77	33.18	3,556.13	1,059.39	15,466.47			
SC VALLEY WIDE	64,350	6,862.85	5,521.85	6,585.35	1,059.39	84,379.44	90,600	96,000	NO

SANTA CLARITA VALLEY WIDE FUTURE SUPPLY

YEAR			
2005	90,600	96,000	NO
2006	90,600	96,000	NO
2007	90,600	96,000	NO
2008	90,600	96,000	NO

CRITERIA

DEMAND FACTORS (AF/YR):	SF	MF	MH	COMMERCIAL (PER ACRE)	INDUSTRIAL (PER ACRE)
NEWHALL WD	0.79	0.22	0.31	2.77	3.14

Note:

Dry Supply - Ranges from 90,600 to 147,500 acre-feet-per year.

Conjunctive-use and groundwater banking supplies are not included in table.

Normal Supply - Ranges from 96,000 to 151,900 acre-feet-per year.

URBAN SERVICES ANALYSIS

FIRE PROTECTION ANALYSIS

4/28/2004

PROJECT NO. 04-075
CASE NO. TR060922

RESPONSE DISTANCE EVALUATION (MILES)

MAXIMUM DISTANCE CRITERIA

Lot Type	Residential	Commercial Industrial	Approximate Distance	Potential Significant Impact
SINGLE FAMILY	6		4.4	No

THE SIGNAL NEWSPAPER
24000 Creekside Rd
Valencia CA 91355

Proof of Publication
(2015.5 C.C.P)

STATE OF CALIFORNIA,
COUNTY OF LOS ANGELES

I am a citizen of the United States, and a resident of the county aforesaid; I am over the age of eighteen years; and I am not a party to or interested in the notice published. I am the chief legal advertising clerk of the publisher of the

SIGNAL NEWSPAPER

a newspaper of general circulation, printed and published **Daily** in the City of **Santa Clarita** County of Los Angeles, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Los Angeles, State of California,
under the date of **March 25, 1988**
Case Number **NVC15880**, that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

11/1 11/2 11/3

All in the year 20 04

I certify (or declare) under penalty of perjury that the foregoing is true and correct

Dated at **Valencia**, California, this

3 day of November 2004

L Estes
Signature

Paste Clipping

Los Angeles County Department of Regional Planning
Notice of Preparation and Scoping Meeting Notification

Date: October 22, 2004

Project: The "Skyline Ranch" Project, County Project No. 04-075, Tentative Tract Map No. 060922

Applicant: Pardee Homes

Notice is hereby given pursuant to California Public Resources Code Section 21083.9 The Los Angeles County Regional Planning Department has conducted an Initial Study for the subject project and has determined that a Environmental Impact Report (EIR) is necessary. Los Angeles County will be the Lead Agency for the project and will be responsible for the EIR preparation. In order for the concerns of responsible and trustee agencies, adjacent jurisdictions, other public agencies, groups and individuals to be incorporated into the Draft EIR, we need to know their views, concerns and recommendations regarding the scope and content of the environmental information relevant to the proposed project. Responsible and trustee agencies must consider the EIR prepared by Los Angeles County when considering a subsequent permit or approval for the project.

The 2,196-acre Skyline Ranch site is located in the Santa Clarita Valley west and north of Highway 14 (Antelope Valley Freeway) and north of the City of Santa Clarita in unincorporated Los Angeles County. The project site includes various parcels west of Mint Canyon between the Santa Clara River and Vasquez Canyon. The site is roughly defined by Sierra Highway (Mint Canyon) on the east and southeast, residential communities on the south and southwest, Plum Canyon Road on the west, Bouquet Canyon Road to the northwest and Vasquez Canyon Road to the northeast.

The project applicant proposes to develop approximately 592 acres of the site with 1,325 single-family residential lots with pads ranging in size from 4,830 to 7,350 square feet along with a 10-acre school site and approximately 10 acres of public park land. Development is proposed for the southern portion of the property where slopes of 25 percent or less are located. The northern 1,604 acres of the site would remain preserved as open space and managed by an as yet to be determined entity.

A Notice of Preparation (NOP) for the EIR is being distributed. The review period for the NOP is from **October 25 to November 24, 2004**. Copies of the NOP are available for review at Canyon Country Library located at 18536 Soledad Canyon Road, Santa Clarita, CA 91351; Valencia County Library at 23743 West Valencia Boulevard, Santa Clarita, CA 91355; Newhall County Library at 22704 West 9th Street, Santa Clarita, CA 91321, as well as at the Department of Regional Planning at the address below, and its website http://planning.co.la.ca.us/drp_agnd.html Tentative Tract Map No. 060922. Due to the time limits mandated by State law, your response must be sent at the earliest possible date, but not later than **November 30, 2004 at 5:00 p.m.** Send written responses to: Dr. Hsiao-ching Chen, AICP, County of Los Angeles Department of Regional Planning, Impact Analysis Section, 320 West Temple Street, Los Angeles, CA 90012-3225; Telephone: (213) 974-6461; Fax (213) 626-0434.

To assist in local participation, a Scoping Meeting will be held to present the proposed project and to solicit suggestions from the public and responsible agencies on the content of the Draft EIR. This meeting will be held in the Canyon Country Joanne Darcy Library located at 18536 Soledad Canyon Road, Santa Clarita, CA 91351 on **November 10th, 2004 from 6:00 p.m. to 8:00 p.m.**

Published in the Signal 11/01, 11/02, 11/3, 2004

COUNTY OF LOS ANGELES
SKYLINE RANCH PROJECT DRAFT EIR
SCOPING MEETING SUMMARY

Date: November 10, 2004

Time: 6:00 P.M. – 8:00 P.M.

Place: Canyon Country Joanne Darcy Library, 18536 Soledad Canyon Road, Santa Clarita

Subject: Skyline Ranch Project Draft EIR

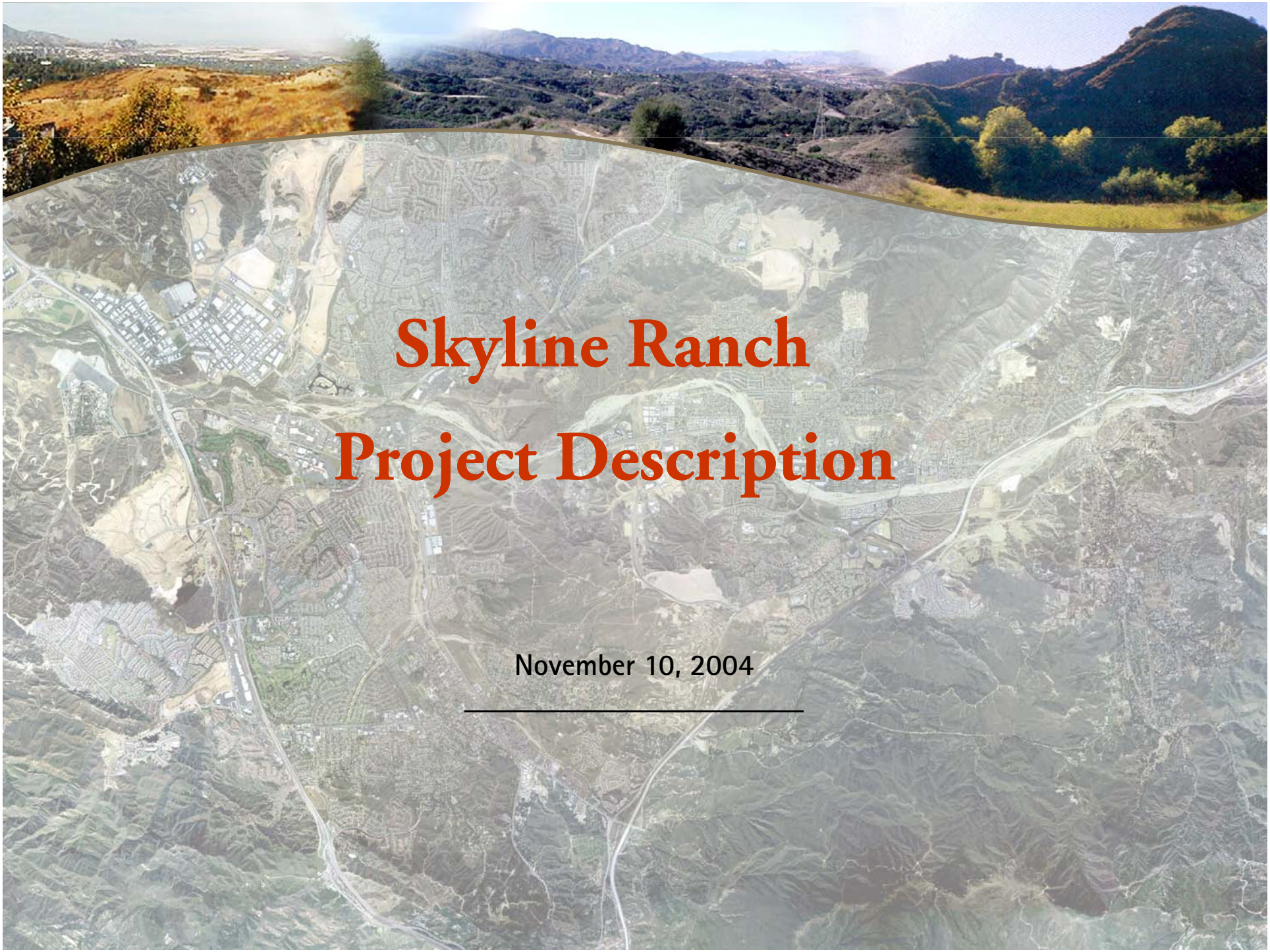
Participating Staff:	Hsiao-ching Chen	County of Los Angeles Regional Planning
	Daryl Koutnik	County of Los Angeles Regional Planning
	Joel Miller	Psomas (Facilitator)
CEQA Consultant:	Stephanie Eyestone-Jones	PCR Services Corporation (CEQA Consultant)
	Jay Ziff	PCR Services Corporation (CEQA Consultant)

Meeting Overview: The main purpose of the scoping meeting was to present an introduction to the Environmental Impact Report (EIR) process, establish base facts about the proposed project, and solicit input on the range of issues to be analyzed in the EIR. Attendees were greeted by County staff, signed-in, and were given informational materials including an agenda and a printout of the slide (Power Point) presentation to be discussed during the meeting. The presentation included an explanation of the meeting agenda and format, an overview of the CEQA process, a summary of the proposed project and its basic components, and a summary of the Initial Study. The presentation was followed by a facilitated public input session, where individuals had an opportunity to state their concerns or questions regarding the information contained in the Initial Study.

The following presents a general summary of meeting comments based on notes taken by the facilitator and the CEQA consultant.

COMMENTOR	SUMMARY OF COMMENTS
Kai Luoma, City of Santa Clarita	▪ Growth inducing impacts resulting from infrastructure extensions ▪ Project may need to be revised; it's dependent on the approval of another project. If that project is not approved, what is the impact on access?
Bill Wittenberg	▪ Skyline Ranch Road is a single means of access ▪ Fire and emergency access issue ▪ No site for a fire station; impacts on the Fire Department ▪ There is currently no water to the site ▪ Does the school district have funds to build the school that is necessary? Will it be operational before occupany? ▪ Use of Soledad Canyon Road
Sgt. Hernandez, CHP	▪ 15 percent increase in traffic collisions since 2001 ▪ No personnel increase in over 20 years; need more officers to patrol highways ▪ CHP has requested 20 new officers but there is no funding ▪ CHP wants to be involved in the school's design and proper access (ingress/egress) for the school

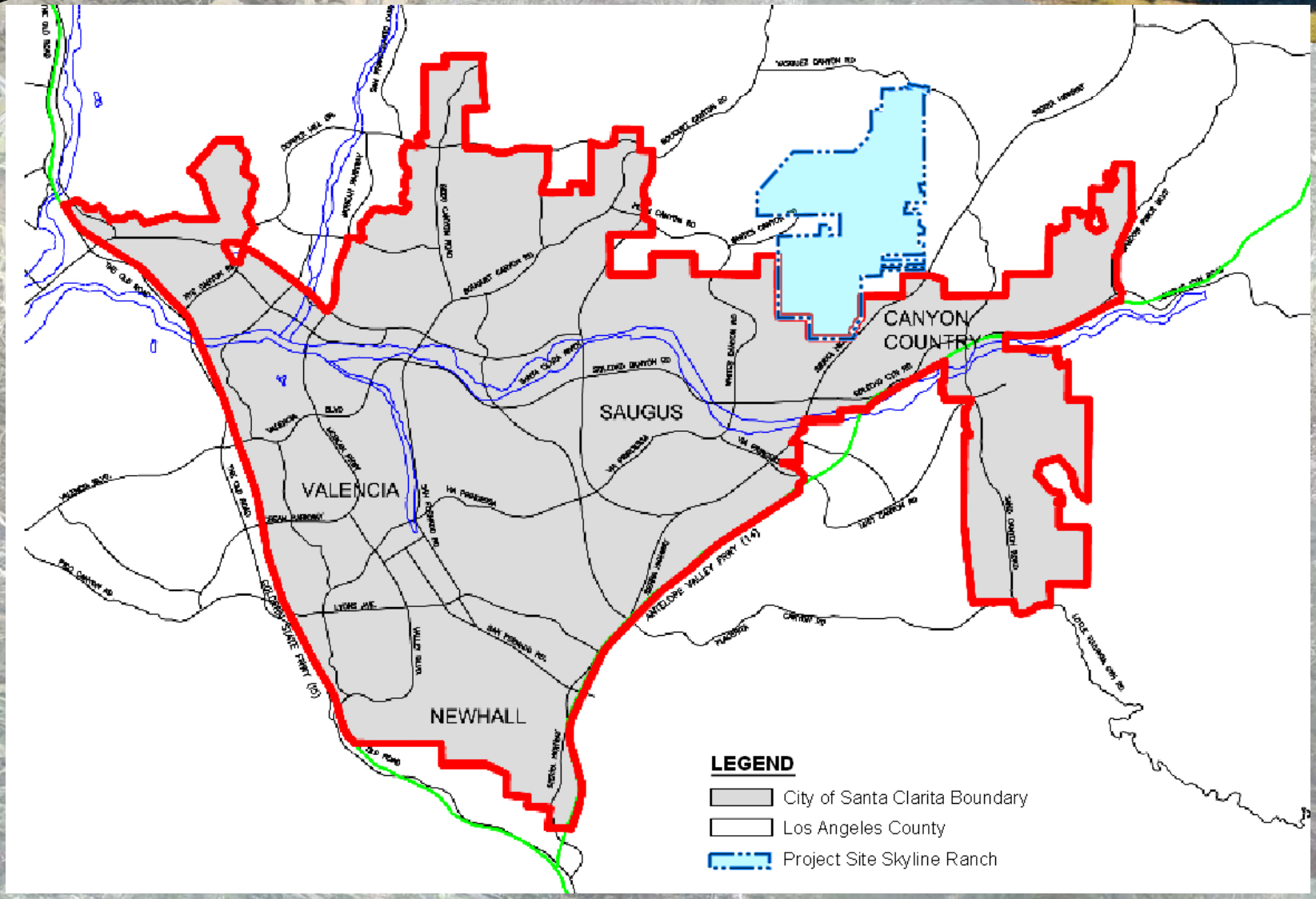
COMMENTOR	SUMMARY OF COMMENTS
Bill Wittenberg	▪ CHP responsibilities are increasing but staffing is not ▪ Staff are needed (Sheriff and CHP) for unincorporated areas ▪ Lack of service by Sheriff's Department ▪ Project will add to existing burden on crime prevention and traffic and the safety of existing residents – biggest issue ▪ Traffic-related safety should be discussed
Roger Peterson	▪ Concerned about whether project will connect to Vasquez Canyon Road (Mystery Mesa) ▪ Will Pardee develop this area? If so, then too much traffic (and hazards) on Vasquez Canyon Road ▪ Traffic from the movie industry should be looked at
Nina Woodbury	▪ Impact on Vasquez Canyon Road ▪ Concern regarding filming traffic ▪ Concern regarding sewers and water ▪ Cross Valley Connector will only add to traffic congestion ▪ All housing tracts make traffic terrible
Bill Wittenberg	▪ What are the benefits of the project? ▪ Will the community park just be graded or will it be improved? What are the amenities? ▪ Will the traffic study go beyond the tract?



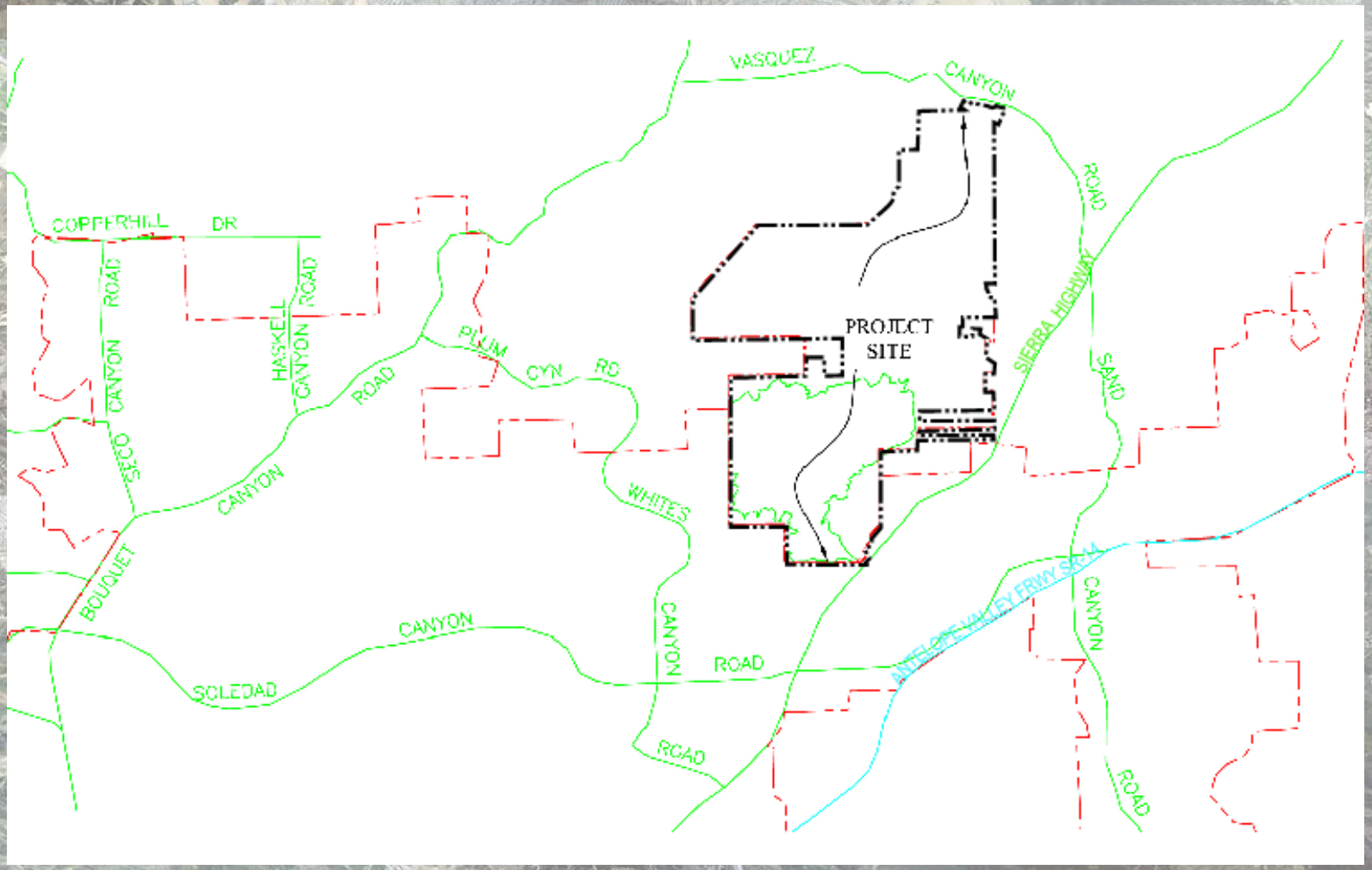
Skyline Ranch
Project Description

November 10, 2004

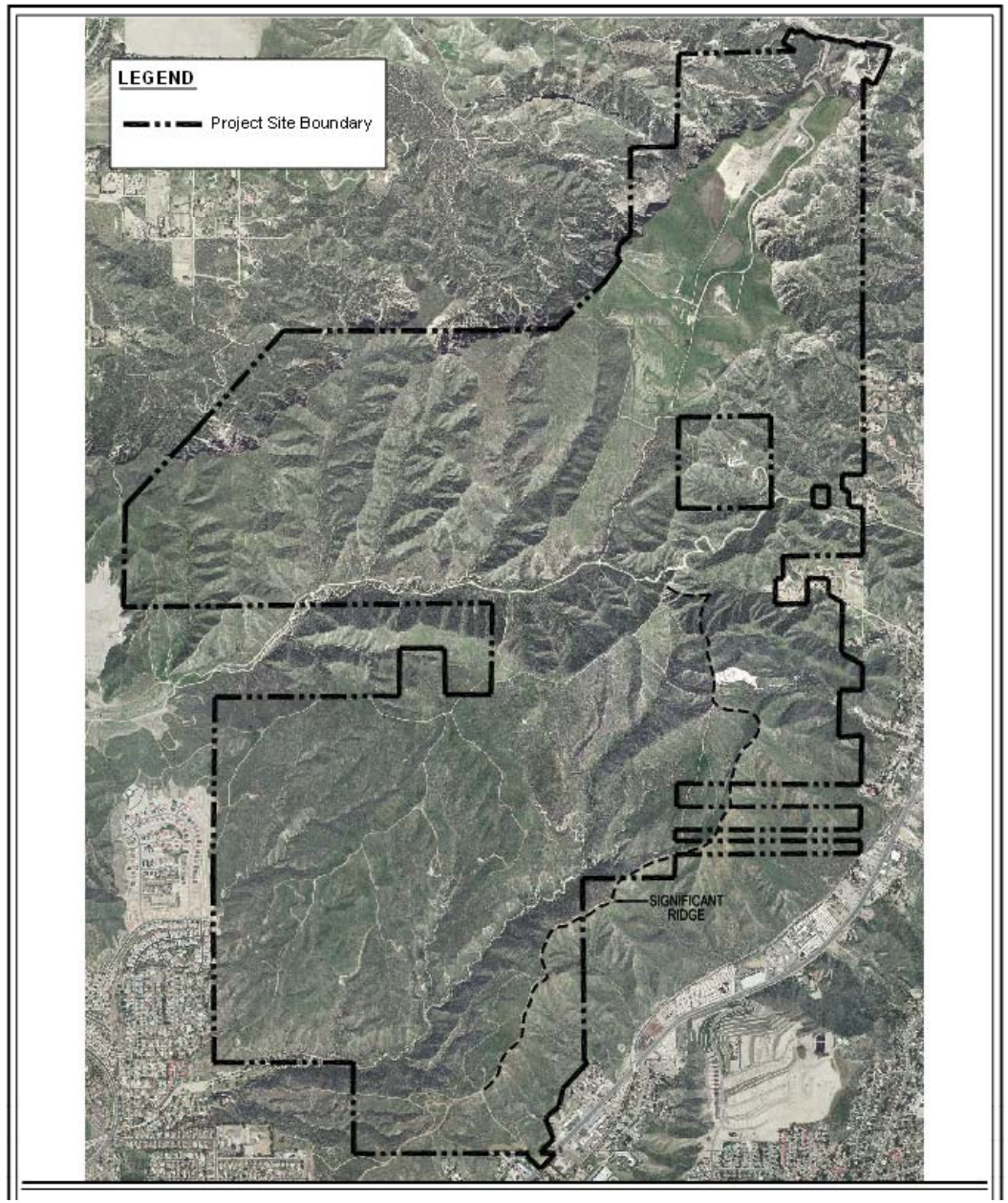
Regional Location



Project Vicinity



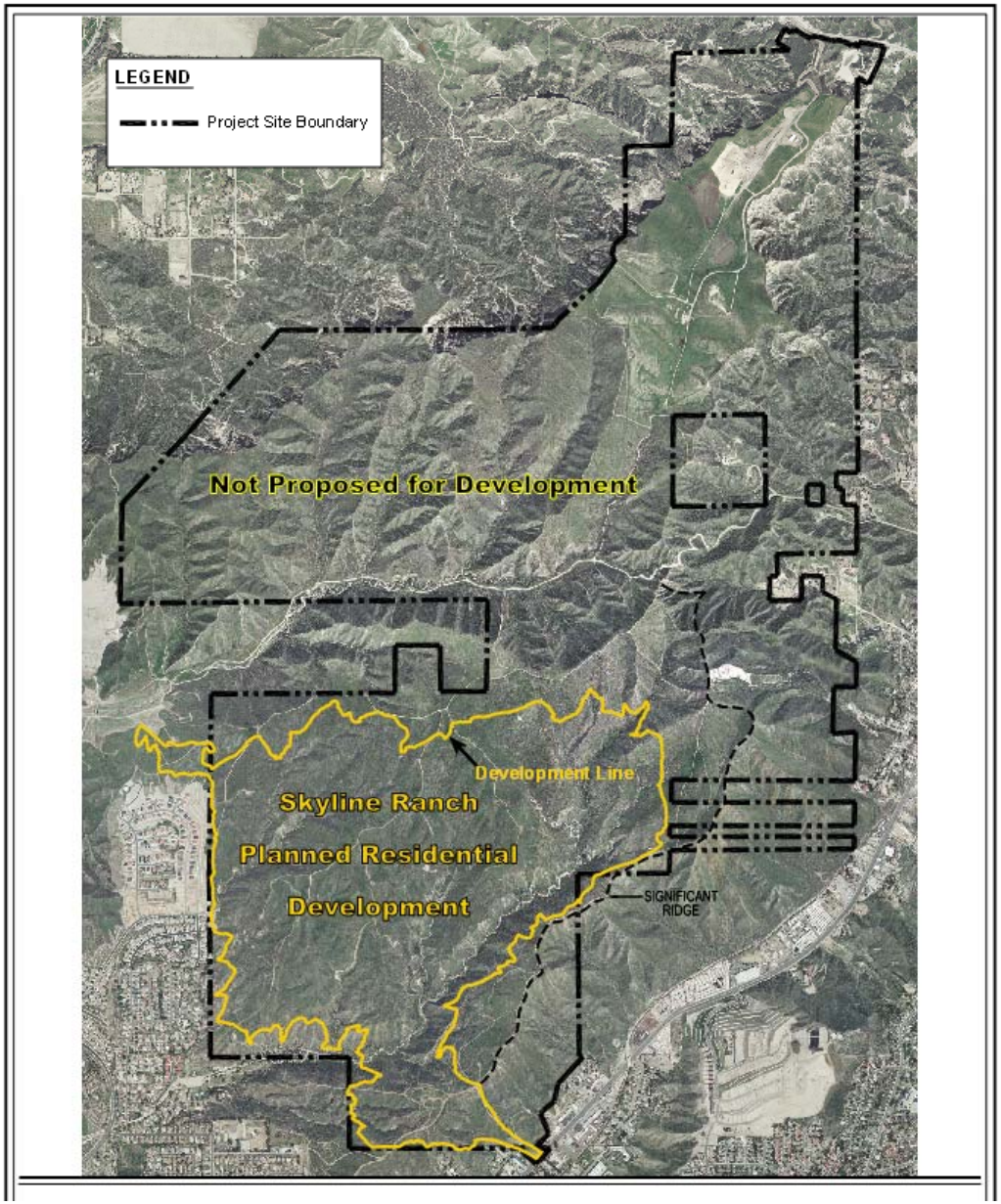
Aerial View of Project Site



Existing Site Characteristics

- Size: 2,196 acres
- Moderate to Steep Slopes, Ridges and Canyons
- Dominant Plant Communities
  Coastal Sage Scrub, Coastal Sage-Chaparral Scrub
- Proposed Cruzan Mesa Vernal Pools SEA
- Previous Uses: Grazing, Landing Strip
- Active Land Uses: Limited, with the exception of an Outdoor Movie Location
- Land Use Designations: U1 (Urban 1.1to 3.3 du/acre); U2 (Urban 3.4 to 6.6 du/acre); U3 (6.7 to 15 du/acre); N (Non Urban 0.5 to 1.0 du/acre); HM (Hillside Management), W (flood plain)
- Zoning Designations: A-2-1 (Heavy Agricultural) and A-1-1 and A-1-10,000 (Light Agricultural)

Aerial View with Development Area



- Northern Area:

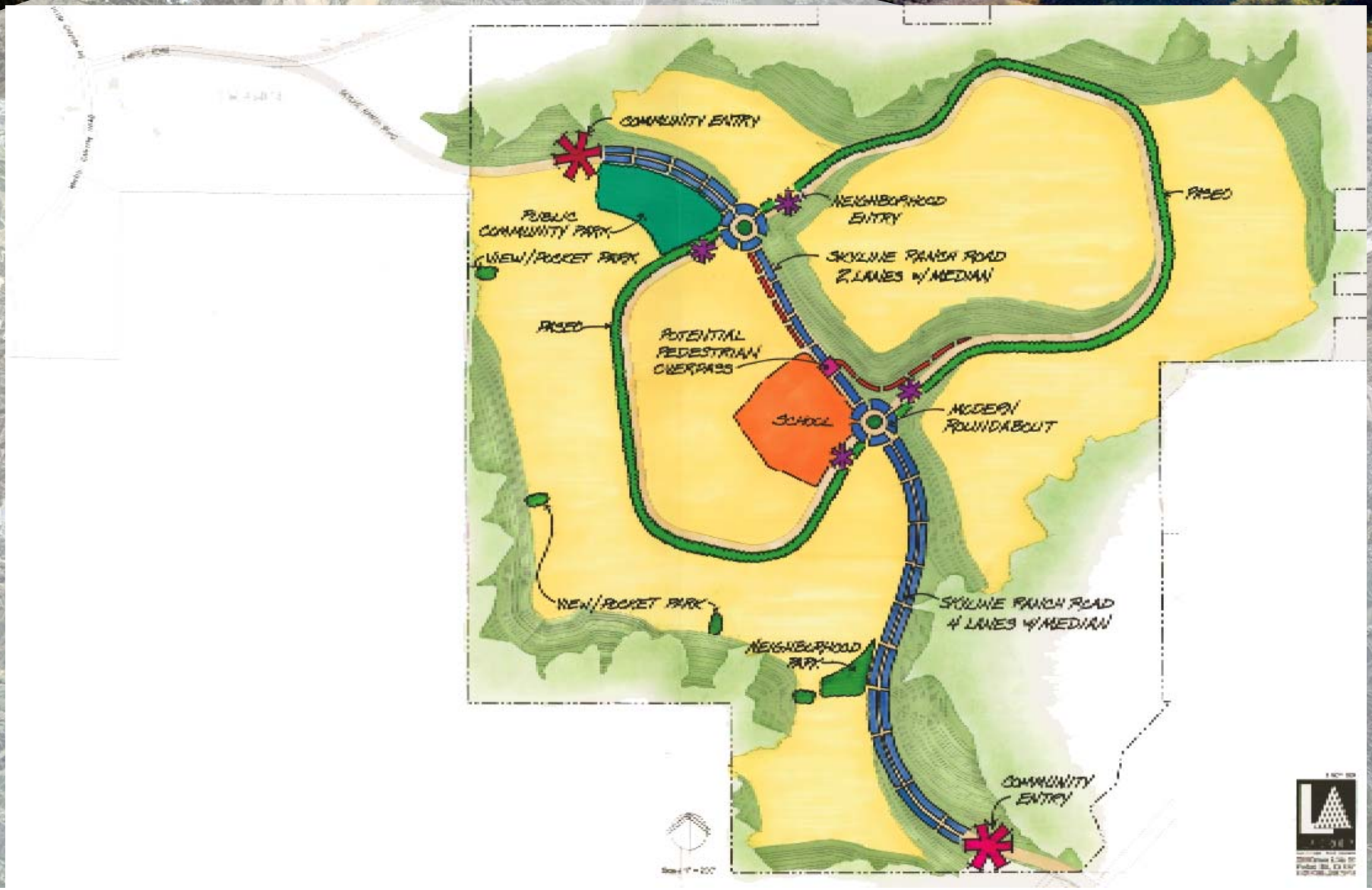
  No Development 1,604 acres (73% of site)

- Southern Area: Development of 592 acres (27% of site)

Proposed Project

- Approximately 1,246 single-family residential lots
- 10 acre public school site (K-6)
- 10 acre public community park, a private neighborhood park, and private pocket parks
- Whites Canyon Road Extension (Skyline Ranch Road)
- Grading: on 27 % of site, concentrated in areas of 25 % or less slopes, substantial cut and fill for infrastructure and development areas
- Landscape Design: transitional perimeter plantings with native and drought tolerant plants, enhanced pedestrian circulation, landscape theme for development area

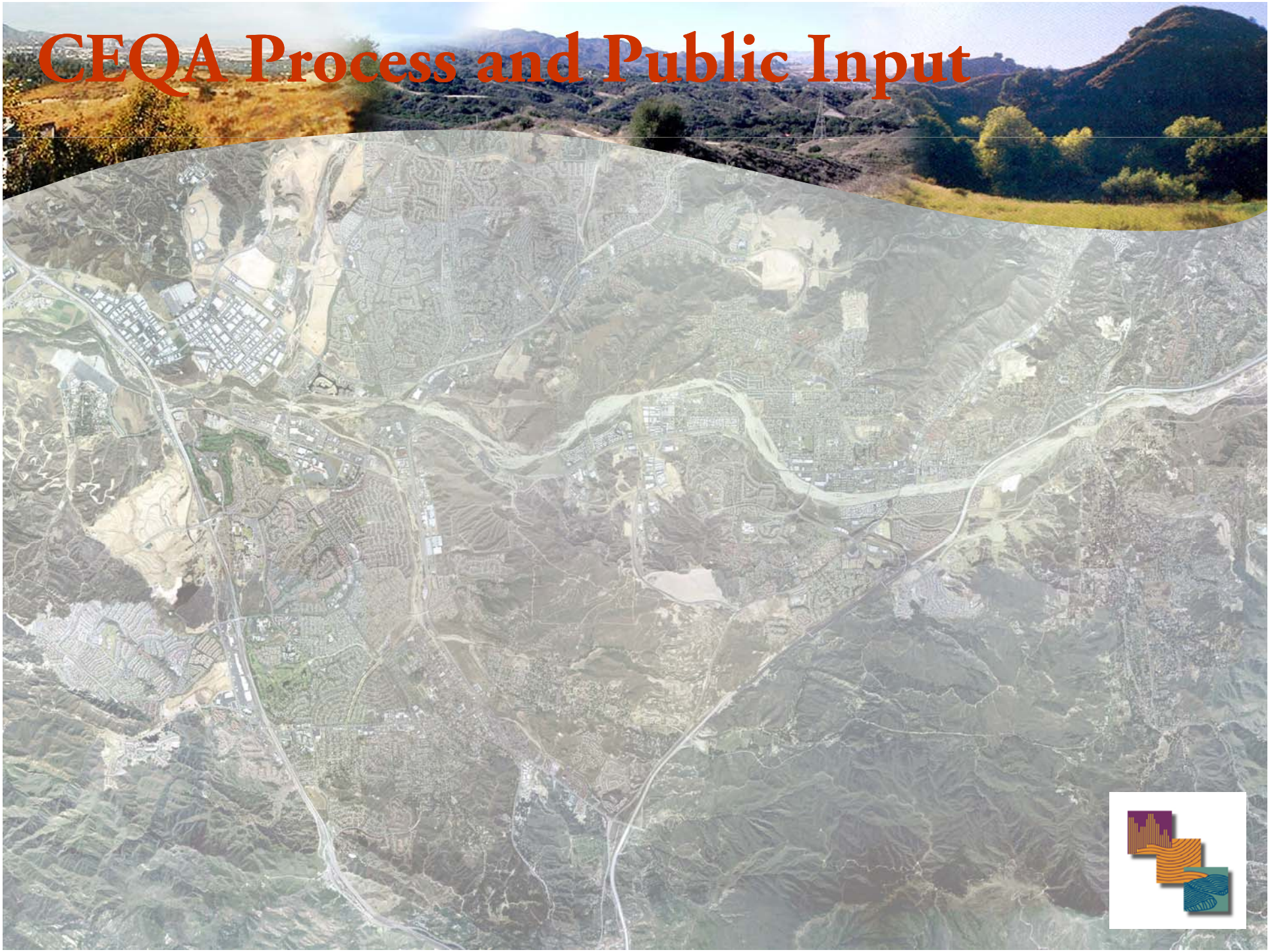
Skyline Ranch Community Design Concept



Discretionary Actions for LA County

- Vesting Tentative Tract Map No. 060922
- Conditional Use Permit for Residential Planned Development
- Oak Tree Permit (1 oak tree)
- Development Agreement
- Other Agency Actions

CEQA Process and Public Input



Sign-In Form
Public Scoping Meeting
The "Skyline Ranch" Project
County Project No. 04-075

November 10, 2004

Name	Organization (if applicable)	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
RICK WINSMAN	PLANNING COMMISSIONER CITY OF SANTA CLARITA			☐
ROGER PETERSON		30815 SUNRISE HILLS RD	661 714-9022	☒
ANDREW HERNANDEZ SERGEANT	CALIFORNIA HIGHWAY PATROL	28648 THE OLD ROAD VALENCIA CA 91355	(661) 294-5540	☒
Adriana Hemans	The Signal	24000 Creekside Rd.	(661) 259-1234	☐
				☐
				☐
				☐
				☐
				☐

Sign-In Form
Public Scoping Meeting
The "Skyline Ranch" Project
County Project No. 04-075

November 10, 2004

Name	Organization (if applicable)	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
DENNIS ROLFE	SANTA CLARITA WATER	P.O. BOX 903 S.C. CA.	661 259 2737	☐
Name	Organization (if applicable)	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
Bill WITTENberg	NONE	28541 N. HASKELL CYN SAUGUS CA 91390	661 213-6891	☒
Name	Organization (if applicable)	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
Kai Luoma	City of Santa Clarita		661 255-4350	☒
Name	Organization (if applicable)	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
				☐
Name	Organization (if applicable)	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
				☐
Name	Organization (if applicable)	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
				☐
Name	Organization (if applicable)	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
				☐
Name	Organization (if applicable)	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
				☐

Sign-In Form
Public Scoping Meeting
The "Skyline Ranch" Project
County Project No. 04-075

November 10, 2004

Name	Organization (if applicable)	Street Address/City/State/ZIP	Phone Number	Check if wish to speak
NINA Woodbury		30815 SunRise Hills Rd	(661) 296 6462	☒
				☐
				☐
				☐
				☐
				☐
				☐
				☐

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Jan Boel
Acting Director

Notice of Preparation

RECEIVED
OCT 28 2004

October 22, 2004

To: Reviewing Agencies

Re: Skyline Ranch Project, Project No. 03-075, Tract Map No. 060922
SCH# 2004101090

Attached for your review and comment is the Notice of Preparation (NOP) for the Skyline Ranch Project, Project No. 03-075, Tract Map No. 060922 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:

Hsiao-ching Chen
Los Angeles County Department of Regional Planning
320 W. Temple Street
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
Associate Planner, State Clearinghouse

Attachments
cc: Lead Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2004101090
Project Title Skyline Ranch Project, Project No. 03-075, Tract Map No. 060922
Lead Agency Los Angeles County Department of Regional Planning

Type NOP Notice of Preparation

Description The project applicant proposes to develop approximately 592 acres of the site with 1,325 single-family residential lots ranging in size from 4,830 to 7,350 square feet along with a 10-acre school site and 10 acres of parks. Development is proposed for the southern portion of the property with slopes of 25 percent or less. The northern 1,604 acres of the site would remain preserved as open space and managed by an as yet to be determined entity.

Lead Agency Contact

Name Hsiao-ching Chen
Agency Los Angeles County Department of Regional Planning
Phone (213) 974-6461 **Fax**
email
Address 320 W. Temple Street
City Los Angeles **State** CA **Zip** 90012

Project Location

County Los Angeles
City Santa Clarita
Region
Cross Streets Sierra Highway, Plum Canyon Road
Parcel No. 2839-0-17 to 19, 2802-02-1, 3 to 8, 10 to 12, 15, 2812-3-45, 4, 27, 2, 2802-03-1, 5, 2812-4-11
Township 4N **Range** 15W **Section** 3,9,10 **Base** SBB&M

Proximity to:

Highways 14
Airports None
Railways Metrolink
Waterways Santa Clara River, Mint Canyon
Schools Canyon HS, Sierra Vista JH, L.H. Cox Elem.
Land Use Vacant (occasional filming use) / A-2-1, A-1-1, A-1-10,000 / Non-urban

Project Issues Aesthetic/Visual; Air Quality; Archaeologic-Historic; Drainage/Absorption; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife; Growth Inducing; Landuse; Cumulative Effects; Other Issues

Reviewing Agencies Resources Agency; Department of Forestry and Fire Protection; Department of Parks and Recreation; Department of Water Resources; Native American Heritage Commission; Office of Emergency Services; Department of Health Services; Department of Fish and Game, Region 5; California Highway Patrol; Department of Housing and Community Development; Public Utilities Commission; Caltrans, District 7; Department of Toxic Substances Control; Regional Water Quality Control Board, Region 4

Date Received 10/22/2004 **Start of Review** 10/22/2004 **End of Review** 11/22/2004

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP Distribution List

County: Los Angeles SCH#

Resources Agency

- [x] **Resources Agency**
  Nadell Gayou
- [ ] **Dept. of Boating & Waterways**
  Suzi Betzler
- [ ] **California Coastal Commission**
  Elizabeth A. Fuchs
- [ ] **Colorado River Board**
  Gerald R. Zimmerman
- [ ] **Dept. of Conservation**
  Roseanne Taylor
- [ ] **California Energy Commission**
  Environmental Office
- [x] **Dept. of Forestry & Fire Protection**
  Allen Robertson
- [ ] **Office of Historic Preservation**
  Hans Kreutzberg
- [x] **Dept of Parks & Recreation**
  B. Noah Tilghman
  Environmental Stewardship Section
- [ ] **Reclamation Board**
  DeeDee Jones
- [ ] **Santa Monica Mountains Conservancy**
  Paul Edelman
- [ ] **S.F. Bay Conservation & Dev't. Comm.**
  Steve McAdam
- [x] **Dept. of Water Resources**
  Resources Agency
  Nadell Gayou

Fish and Game

- [ ] **Dept. of Fish & Game**
  Scott Flint
  Environmental Services Division
- [ ] **Dept. of Fish & Game 1**
  Donald Koch
  Region 1
- [ ] **Dept. of Fish & Game 2**
  Banky Curtis
  Region 2
- [ ] **Dept. of Fish & Game 3**
  Robert Floerke
  Region 3
- [ ] **Dept. of Fish & Game 4**
  William Laudermilk
  Region 4
- [x] **Dept. of Fish & Game 5**
  Don Chadwick
  Region 5, Habitat Conservation Program
- [ ] **Dept. of Fish & Game 6**
  Gabrina Gatchel
  Region 6, Habitat Conservation Program
- [ ] **Dept. of Fish & Game 6 I/M**
  Tammy Allen
  Region 6, 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
- [ ] **Dept. of General Services**
  Robert Sleppy
  Environmental Services Section
- [x] **Dept. of Health Services**
  Wayne Hubbard
  Dept. of Health/Drinking Water

Independent Commissions,Boards

- [ ] **Delta Protection Commission**
  Debby Eddy
- [x] **Office of Emergency Services**
  John Rowden, Manager
- [ ] **Governor's Office of Planning & Research**
  State Clearinghouse

_____

- [x] **Native American Heritage Comm.**
  Debbie Treadway
- [x] **Public Utilities Commission**
  Ken Lewis
- [ ] **State Lands Commission**
  Jean Sarino
- [ ] **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Business, Trans & Housing

- [ ] **Caltrans - Division of Aeronautics**
  Sandy Hesnard
- [ ] **Caltrans - Planning**
  Terri Pencovic
- [x] **California Highway Patrol**
  John Olejnik
  Office of Special Projects
- [x] **Housing & Community Development**
  Cathy Creswell
  Housing Policy Division

Dept. of Transportation

- [ ] **Dept. of Transportation 1**
  Mike Eagan
  District 1
- [ ] **Dept. of Transportation 2**
  Don Anderson
  District 2
- [ ] **Dept. of Transportation 3**
  Jeff Pulverman
  District 3
- [ ] **Dept. of Transportation 4**
  Tim Sable
  District 4
- [ ] **Dept. of Transportation 5**
  David Murray
  District 5
- [ ] **Dept. of Transportation 6**
  Marc Birnbaum
  District 6
- [x] **Dept. of Transportation 7**
  Cheryl J. Powell
  District 7
- [ ] **Dept. of Transportation 8**
  John Pagano
  District 8
- [ ] **Dept. of Transportation 9**
  Gayle Rosander
  District 9
- [ ] **Dept. of Transportation 10**
  Tom Dumas
  District 10
- [ ] **Dept. of Transportation 11**
  Mario Orso
  District 11
- [ ] **Dept. of Transportation 12**
  Bob Joseph
  District 12

Cal EPA

Air Resources Board

- [ ] Airport Projects
  Jim Lerner
- [ ] Transportation Projects
  Kurt Karperos
- [ ] Industrial Projects
  Mike Tollstrup

- [ ] **California Integrated Waste Management Board**
  Sue O'Leary
- [ ] **State Water Resources Control Board**
  Jim Hockenberry
  Division of Financial Assistance
- [ ] **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] **State Water Resouces Control Board**
  Steven Herrera
  Division of Water Rights
- [x] **Dept. of Toxic Substances Control**
  CEQA Tracking Center

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)
- [x] **RWQCB 4**
  Jonathan Bishop
  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 05/21/04

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 · www.aqmd.gov

October 28, 2004

RECEIVED
NOV 1 2004

Dr. Hsiao-ching Chen, AICP
Los Angeles County Regional Planning Dept.
Impact Analysis Section
320 West Temple Street, Room 1348
Los Angeles, CA 90012

Dear Dr. Chen:

Notice of Preparation of a Draft Environmental Impact Report for
The Skyline Ranch 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.

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, lead agency may wish to consider using the California Air Resources Board (CARB) approved URBEMIS 2002 Model. This model is available on the CARB Website at: www.arb.ca.gov.

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 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. 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 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. 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. 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,

Michael Krause

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

SS:CB:li

LAC041026-06LI
Control Number

County of Los Angeles
Sheriff's Department Headquarters
4700 Ramona Boulevard
Monterey Park, California 91754-2169
(661) 255-1121

LEROY D. BACA, SHERIFF

RECEIVED
NOV 9 2004

November 3, 2004

Dr. Hsiao-ching Chen, AICP
Los Angeles County Regional Planning
320 W. Temple Street
Los Angeles, California 90012-3225

Dear Dr. Chen:

INITIAL STUDY
TRACT NO. 060922, PROJECT NO. 04-075
SKYLINE RANCH PROJECT

The proposed Project consisting of 1,343 single family residential units, west of Mint Canyon and Sierra Highway between the Santa Clara River and Vasquez Canyon, is within the jurisdiction of the Los Angeles County Sheriff's Department, Santa Clarita Valley Station, 23740 Magic Mountain Parkway, Valencia, California. The station is located approximately 9-10 miles from the project site.

It is anticipated that the non-emergent response time to a request for service would be approximately 25-35 minutes. The priority response time would be approximately 8-11 minutes and the response time under emergent circumstances would be approximately 5-8 minutes. All response times are approximations, only, and would be dependent on both the deployment of area radio cars and traffic conditions.

This station serves an area of 656 square miles, which is made up of the City of Santa Clarita and unincorporated County area between the Los Angeles City Limits to the South, the Kern County Line to the North and involving all area between the Ventura County Line to the West and the township of Aqua Dulce to the East. The population served by our station is approximately 200,000 residents.

Our ideal officer to population ratio is one deputy per 1,000 residents and with our current staffing of 161 sworn deputies currently assigned, our ratio is less than ideal at one deputy per every 1,243 residents. Assuming a residential density of 3.01 persons per dwelling unit, this proposed project will generate a population increase of 4,042. Based on the above, this project would require four additional deputies to the station complement.

Our primary concern is our ability to provide an adequate level of protection and service to all areas we police. Due to the rapidly expanding population of the Santa Clarita Valley and its record-setting home building, it is difficult to project the impact of this project on law enforcement.

Adding this project and other projects in progress, either proposed, approved or committed, it is certain they will all significantly strain our resources to the breaking point. Additionally, the increase in required field personnel will necessitate a concomitant increase in support resources such as detectives, complaint desk officers, vehicles and portable radios. While not directly a builder's matter, our ability to provide a sufficient level of law enforcement services must be considered when applications for new projects such as these are considered.

While we do not oppose this project, we are seriously concerned about our ability to adequately police this area. Without a commitment from the Board of Supervisors to provide sufficient funding, we may face a situation where we cannot provide timely emergency services.

It is suggested, for the security and safety of the residents, that the following crime prevention measures be implemented during site and building layout design:

- Provide lighting in open areas and parking lots;
- Ensure the visibility of doors and windows from the street and between buildings;
- Provide adequate parking spaces in the parking lots to accommodate shoppers, employees and residents;
- Ensure that the required building address numbers are lighted and readily apparent from the street for emergency response agencies.

Should you have further questions, please feel free to call me at (661) 255-1121 extension 5102, or Deputy Patrick Rissler at extension 5159.

Sincerely,

LEROY D. BACA, SHERIFF

Patti A. Minutello, Captain
Santa Clarita Valley Station

cc: Mr. Gary T.K. Tse, Director
Facilities Planning Bureau

PAM;par

COUNTY OF LOS ANGELES
DEPARTMENT OF HEALTH SERVICES
Public Health

THOMAS L. GARTHWAITE, M.D.
DIRECTOR and CHIEF MEDICAL OFFICER

FRED LEAF
CHIEF OPERATING OFFICER

JONATHAN E. FIELDING, M.D., M.P.H.
Director of Public Health and Health Officer

Environmental Health
ARTURO AGUIRRE, Director

Bureau of Environmental Protection
Mountain & Rural/Water, Sewage & Subdivision Program
5050 Commerce Drive, Baldwin Park, CA 91706-1423
TEL (626)430-5380 · FAX (626)813-3016
www.lapublichealth.org/eh/progs/envirp.htm

RECEIVED
NOV 15 2004

BOARD OF SUPERVISORS

Gloria Molina
First District

Yvonne Brathwaite Burke
Second District

Zev Yaroslavsky
Third District

Don Knabe
Fourth District

Michael D. Antonovich
Fifth District

November 3, 2004

Hsiao-ching Chen,
Impact Analysis Section,
Department of Regional Planning
320 W. Temple St., Los Angeles, CA 90012

RE: Project No. 04-075/TR 060922; The Skyline Ranch Project, Canyon Country

This is in response to request for comments regarding Notice of Preparation of a Draft Environmental Impact Report for the above referenced development project that was forwarded to this Department.

Mountain & Rural/Water, Sewage & Subdivision program of Environmental Health has reviewed the information submitted and has no objection to the noted development with the understanding that adequate and sustainable potable water shall be supplied through an existing public water systems or an improvement district which will guarantee water connection and service to the entire project area. Furthermore waste water treatment for the entire project site shall be accommodated by public sewer and waste water treatment facilities of the Los Angeles County Sanitation District.
However, this preliminary review encompasses issues that pertain to this program; other potential environmental impacts associated with the development of this project should be addressed by their respective programs/units, e.g., acoustical impact review and analysis should be conducted by Environmental Hygiene Program of this Department.

We would like to receive and review future subsequent documents that will be prepared for this project.

If you have any questions or need additional information, please contact me at 626-430-5380.

Respectfully,

Patrick Nejadian, Program Director
Mountain & Rural/Water, Sewage & Subdivision Program

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422
www.lacsd.org

JAMES F. STAHL
Chief Engineer and General Manager

November 9, 2004

File No: 26-00.04-00

RECEIVED
NOV 15 2004

Dr. Hsiao-ching Chen, AICP
Impact Analysis Section
Los Angeles County
Department of Regional Planning
320 West Temple Street, Room 1348
Los Angeles, CA 90012

Dear Dr. Chen:

Skyline Ranch Project, County Project No. 04-075, Tract Map No. 060922

The County Sanitation Districts of Los Angeles County (Districts) received a Notice of Preparation of a Draft Environmental Impact Report for the subject project on October 25, 2004. We offer the following comments regarding sewerage service:

1. Most of the project area is outside the jurisdictional boundaries of the Districts and will require annexation into District No. 26 before sewerage service can be provided to the proposed development. For specific information regarding the annexation procedure and fees, please contact Ms. Margarita Cabrera at extension 2708. Copies of the Districts' Annexation Information and Processing Fees sheets are enclosed for your convenience.

2. Because of the project's location, the flow originating from the proposed project would have to be transported to the Districts' trunk sewer by local sewer(s) that are not maintained by the Districts. If no local sewer lines currently exist, it is the responsibility of the developer to convey any wastewater generated by the project to the nearest local sewer and/or Districts' trunk sewer. The nearest Districts' trunk sewer is the Soledad Canyon Trunk Sewer, Section 5, located in Soledad Canyon Road at Sierra Highway. This 18-inch diameter trunk sewer has a design capacity of 6.4 million gallons per day (mgd) and conveyed a peak flow of 4.5 mgd when last measured in 2003.

3. Due to the large amount of wastewater the future development would generate, the proposed project may have significant impacts on the Districts' sewerage system. Although a relief sewer is not scheduled for construction at this time, if additional flows are generated and the Districts' trunk sewer nears capacity, construction of a relief sewer will be scheduled, depending on the availability of relief project funding.

4. The Districts operate two water reclamation plants (WRPs), the Saugus WRP and the Valencia WRP, which provide wastewater treatment in the Santa Clarita Valley. These facilities are interconnected to form a regional treatment system known as the Santa Clarita Valley Joint Sewerage System (SCVJSS) that currently has a permitted treatment capacity of 19.1 mgd. A

9 mgd expansion of the Valencia WRP will be completed in 2004 and is expected to meet the Regional Growth Management Plan forecasted demand through 2010. The SCVJSS currently processes an average flow of 18.4 mgd.

5. The expected average wastewater flow from the project site is 386,500 gallons per day. A copy of the Districts' average wastewater generation factors is enclosed for your information.

6. The Districts are empowered by the California Health and Safety Code to charge a fee for the privilege of connecting (directly or indirectly) to the Districts' Sewerage System or increasing the existing strength and/or quantity of wastewater attributable to a particular parcel or operation already connected. This connection fee is required to construct an incremental expansion of the Sewerage System to accommodate the proposed project, which will mitigate the impact of this project on the present Sewerage System. Payment of a connection fee will be required before a permit to connect to the sewer is issued. A copy of the Connection Fee Information Sheet is enclosed for your convenience. For more specific information regarding the connection fee application procedure and fees, please contact the Connection Fee Counter at extension 2727.

7. In order for the Districts to conform to the requirements of the Federal Clean Air Act (CAA), the design capacities of the Districts' wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development of the SCAG regional growth forecast are incorporated into the Air Quality Management Plan, which is prepared by the South Coast Air Quality Management District in order to improve air quality in the South Coast Air Basin as mandated by the CAA. All expansions of Districts' facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the Districts' treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service, but is to advise you that the Districts intend to provide this service up to the levels that are legally permitted and to inform you of the currently existing capacity and any proposed expansion of the Districts' facilities.

If you have any questions, please contact the undersigned at (562) 699-7411, extension 2717.

Very truly yours,

James F. Stahl

Ruth I. Frazen

Ruth I. Frazen
Engineering Technician
Planning & Property Management Section

RIF:rf
Enclosures
c: M. Cabrera
415374.1

INFORMATION SHEET FOR APPLICANTS REQUESTING ANNEXATION TO A COUNTY SANITATION DISTRICT OF LOS ANGELES COUNTY

A. ELIGIBILITY CRITERIA FOR ANNEXATION TO A COUNTY SANITATION DISTRICT OF LOS ANGELES COUNTY

1. The property is contiguous to said County Sanitation District or, if not contiguous, may be drained by gravity to a trunk sewer of that District,

2. The property is not included in whole or in part in any other agency providing services similar to those of the said County Sanitation District, and

3. The property is to be benefited by its inclusion in the said County Sanitation District.

B. HOW DO I INITIATE THE ANNEXATION APPLICATION PROCESS?

1. WRITE TO: County Sanitation Districts of Los Angeles County
   P.O. Box 4998, Whittier, CA 90607
   Attn: Annexation Fee Program

   The letter should contain the following information and support documentation about the property involved:

   a) Property location (street address, city, zip and Thomas Brothers map, page, grid)

   b) In case of a recorded single lot, include the County Assessor's map book-page-parcel map with the parcel highlighted.

   c) In case of a tract or parcel map, include a copy of the tentative or final map plus a closed-survey engineering traverse around the boundary to be annexed to the centerline of any public street.

   CALL: County Sanitation Districts of Los Angeles County
   (562) 699-7411, Extension 2708
   7:00 a.m. through 4:30 p.m., Monday through Thursday
   7:00 a.m. through 3:30 p.m., Fridays, except holidays

2. Districts' staff will calculate the acreage involved and will provide the applicant with a quote of annexation fees to be paid. At this time, the applicant will also be provided with a *"Request for Annexation"* form along with necessary instructions.

3. An annexation application file will be opened upon submittal by applicant of all the required documents (refer to Section C) along with a check for the annexation fee made payable to:

   County Sanitation Districts of Los Angeles County

C. WHAT DOCUMENTS DO I NEED TO FILE?

1. **"Request for Annexation" Form (4 pages)**: All applicants must complete, in detail, and return the Request for Annexation form signed by the legal owner whose name appears on the current Los Angeles County assessment roll. See C5) for assistance in completing page 4 of this form.

2. **Los Angeles County Local Agency Formation Commission Party Disclosure Form:** All applicants must complete and return the Party Disclosure Form pursuant to the Local Agency Formation Commission Party Disclosure Form Information Sheet.

3. **Annexation Fee payment** as stated in the quotation letter. Cash will not be accepted.

4. **Copy of Grant Deed** (Applicants must submit a copy of the Grant Deed which includes the legal description. Disregard this request if the proposed project is a tract/parcel map.)

5. **California Environmental Quality Act (CEQA):** All applications are subject to CEQA. **If you are applying for a single-family home on septic tank, your project is exempt and the Notice of Exemption will be prepared by this office.** As required by LAFCO, all other applicants must provide twenty six (26) copies of the Initial Study, Final Negative Declaration, Final Mitigated Negative Declaration, Notice of Determination, and Mitigation Monitoring and Reporting Program approved by a city or County Regional Planning Commission, or five (5) copies each of the Final Environmental Impact Report (EIR) and the Notice of Determination approved by a city or County Regional Planning Commission, whichever is applicable

6. **Radius Map and Corresponding Mailing Labels for LAFCO:** All developers are required to submit a radius map within a 300-foot radius of the exterior boundaries of the project area and each parcel of land lying entirely or partially within a 300-foot radius. A set of mailing labels of those landowners that are within a 300-foot radius of the exterior boundaries of the subject area is also required. Provide a list of the Assessor's parcel number, name, and address of each landowner.

7. ***Please Note:*** The annexation fees and application will not be accepted until *all* of the required items have been submitted.

D. HOW MUCH DO I HAVE TO PAY?

The annexation fee consists of three processing fees. The **Annexation Processing Fees** table is attached. The Sanitation Districts, as the lead agency for the annexation, will collect the processing fees at time of annexation application. The three processing fees are for: 1) County Sanitation Districts of Los Angeles County (CSD), 2) Local Agency Formation Commission (LAFCO), and 3) State Board of Equalization (SBE). The LAFCO and SBE processing fees are subject to change without notice. If their fees increase before your application is processed by this office for submittal to these agencies, then you will be notified and the additional monies must be paid before the annexation procedure can be finalized.

E. HOW LONG DOES IT TAKE TO PROCESS MY ANNEXATION APPLICATION?

If the project is a recorded single family lot, Districts' staff will begin processing the annexation application as soon as the required forms are submitted and the annexation fees paid. Upon payment of the annexation fees, for all Sanitation Districts except 26 & 32, the applicant may pay the connection fees and proceed with the project.

If the project is a tract or parcel map, Districts' staff will begin processing the annexation application as soon as the required forms, annexation fees and a copy of the recorded tract/parcel map blueline are submitted. Upon payment of annexation fees, the applicant may have the original sewer map signed off. Also, for all Sanitation Districts except 26 & 32, the applicant may pay the connection fees. The annexation procedure cannot be completed until after receipt, in this office, of the recorded tract/parcel blueline map.

F. WHERE CAN I GET ADDITIONAL INFORMATION?

For additional information, please call:

County Sanitation Districts of Los Angeles County
(562) 699-7411, Extension 2708
7:00 a.m. through 4:30 p.m., Monday through Thursday
7:00 a.m. through 3:30 p.m., Fridays, except holidays

ANNEXATION PROCESSING FEES FOR THE COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY

COUNTY SANITATION DISTRICTS' PROCESSING FEE	ACREAGE			FEE
	0.0	to	1.5	$800
	>1.5	to	5.0	$1,075
	>5.0	to	20.0	$215/Acre
	Over 20.0			$4,300 Plus $35/Additional Acre And Every Fraction Thereof

LOCAL AGENCY FORMATION COMMISSION FILING FEE[1/]	ACREAGE			FEE
ANNEXATIONS AND DETACHMENTS	0.0	to	1.0	$2,500
	>1.0	to	5.0	$3,000
	>5.0	to	10.0	$3,500
	>10.0	to	25.0	$5,000
	>25.0	to	50.0	$6,000
	>50.0	to	160.0	$7,000
	160.0+ Acres			$8,000
OTHER PROPOSALS	Special Reorganization			$10,000
	Incorporation/Disincorporation/Consolidation			$7,500
	District Formation			$7,500
	District Dissolution/Consolidation/Merger			$5,000
	Establishment of Subsidiary District			$4,000
	Reorganizations			Basic Fee*+ 20%
	Amend Existing Sphere of Influence for an Annexation			$500
	Amend Existing Sphere of Influence for Action other than an Annexation			20% of Basic Fee
	Amend/Update Existing Sphere of Influence Without other Action			
	0.0	to	1.0	$2,500
	>1.0	to	5.0	$3,000
	>5.0	to	10.0	$3,500
	>10.0	to	25.0	$5,000
	>25.0	to	50.0	$6,000
	>50.0	to	160.0	$7,000
	160.0+ Acres			$7,000
	Reconsideration of LAFCO Determinations			50% of Basic Fee
	Special District Study			Actual Cost
	Out-of-Agency Service Agreements			$2,000
	Petition Verification			Actual Cost
	Notice/Radius Map			Actual Cost
	State Controller Review			$2,000 + Actual Cost

*The "Basic Fee" is the filing fee charged for the underlying change of organization associated with the action indicated. If more than one change of organization is proposed, it is the higher fee.

STATE BOARD OF EQUALIZATION[2/]	ACREAGE			FEE
SINGLE AREA TRANSACTIONS	0.0	to	1.0	$300
	1.0	to	5.0	$350
	6.0	to	10.0	$500
	11.0	to	20.0	$800
	21.0	to	50.0	$1,200
	51.0	to	100.0	$1,500
	101.0	to	500.0	$2,000
	501.0	to	1,000.0	$2,500
	1,001.0	to	2,000.0	$3,000
	2,001.0 and Above			$3,500
OTHER PROPOSALS	Deferral of Fees			$35
	Additional County per Transaction			$250
	Consolidation per District or Zone			$300
	Entire District Transaction			$300
	Coterminous Transaction			$300
	Dissolution or Name Change			$0

[1/]Most recent LAFCO fee increase effective June 1, 2003.
[2/]Most recent SBE fee increase effective December 2, 1998.

L:\annexfee\annexation\forms\annexfees.doc

Rev July 17, 2003

TABLE 1

LOADINGS FOR EACH CLASS OF LAND USE

DESCRIPTION	UNIT OF MEASURE	FLOW (Gallons Per Day)	COD (Pounds Per Day)	SUSPENDED SOLIDS (Pounds Per Day)
RESIDENTIAL				
Single Family Home	Parcel	260	1.22	0.59
Duplex	Parcel	312	1.46	0.70
Triplex	Parcel	468	2.19	1.05
Fourplex	Parcel	624	2.92	1.40
Condominiums	Parcel	195	0.92	0.44
Single Family Home (reduced rate)	Parcel	156	0.73	0.35
Five Units or More	No. of Dwlg. Units	156	0.73	0.35
Mobile Home Parks	No. of Spaces	156	0.73	0.35
COMMERCIAL				
Hotel/Motel/Rooming House	Room	125	0.54	0.28
Store	1000 ft^2	100	0.43	0.23
Supermarket	1000 ft^2	150	2.00	1.00
Shopping Center	1000 ft^2	325	3.00	1.17
Regional Mall	1000 ft^2	150	2.10	0.77
Office Building	1000 ft^2	200	0.86	0.45
Professional Building	1000 ft^2	300	1.29	0.68
Restaurant	1000 ft^2	1,000	16.68	5.00
Indoor Theatre	1000 ft^2	125	0.54	0.28
Car Wash				
Tunnel - No Recycling	1000 ft^2	3,700	15.86	8.33
Tunnel - Recycling	1000 ft^2	2,700	11.74	6.16
Wand	1000 ft^2	700	3.00	1.58
Financial Institution	1000 ft^2	100	0.43	0.23
Service Shop	1000 ft^2	100	0.43	0.23
Animal Kennels	1000 ft^2	100	0.43	0.23
Service Station	1000 ft^2	100	0.43	0.23
Auto Sales/Repair	1000 ft^2	100	0.43	0.23
Wholesale Outlet	1000 ft^2	100	0.43	0.23
Nursery/Greenhouse	1000 ft^2	25	0.11	0.06
Manufacturing	1000 ft^2	200	1.86	0.70
Dry Manufacturing	1000 ft^2	25	0.23	0.09
Lumber Yard	1000 ft^2	25	0.23	0.09
Warehousing	1000 ft^2	25	0.23	0.09
Open Storage	1000 ft^2	25	0.23	0.09
Drive-in Theatre	1000 ft^2	20	0.09	0.05

TABLE 1
(continued)

LOADINGS FOR EACH CLASS OF LAND USE

DESCRIPTION	UNIT OF MEASURE	FLOW (Gallons Per Day)	COD (Pounds Per Day)	SUSPENDED SOLIDS (Pounds Per Day)
COMMERCIAL				
Night Club	1000 ft^2	350	1.50	0.79
Bowling/Skating	1000 ft^2	150	1.76	0.55
Club	1000 ft^2	125	0.54	0.27
Auditorium, Amusement	1000 ft^2	350	1.50	0.79
Golf Course, Camp, and Park (Structures and Improvements	1000 ft^2	100	0.43	0.23
Recreational Vehicle Park	No. of Spaces	55	0.34	0.14
Convalescent Home	Bed	125	0.54	0.28
Laundry	1000 ft^2	3,825	16.40	8.61
Mortuary/Cemetery	1000 ft^2	100	1.33	0.67
Health Spa, Gymnasium				
With Showers	1000 ft^2	600	2.58	1.35
Without Showers	1000 ft^2	300	1.29	0.68
Convention Center, Fairground, Racetrack, Sports Stadium/Arena	Average Daily Attendance	10	0.04	0.02
INSTITUTIONAL				
College/University	Student	20	0.09	0.05
Private School	1000 ft^2	200	0.86	0.45
Church	1000 ft^2	50	0.21	0.11

INFORMATION SHEET FOR APPLICANTS
PROPOSING TO CONNECT OR INCREASE THEIR DISCHARGE TO
THE COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY SEWERAGE SYSTEM

THE PROGRAM

The County Sanitation Districts of Los Angeles County are empowered by the California Health and Safety Code to charge a fee for the privilege of connecting to a Sanitation District's sewerage system. Your connection to a City or County sewer constitutes a connection to a Sanitation District's sewerage system as these sewers flow into a Sanitation District's system. The County Sanitation Districts of Los Angeles County provide for the conveyance, treatment, and disposal of your wastewater. **PAYMENT OF A CONNECTION FEE TO THE COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY WILL BE REQUIRED BEFORE A CITY OR THE COUNTY WILL ISSUE YOU A PERMIT TO CONNECT TO THE SEWER.**

I. WHO IS REQUIRED TO PAY A CONNECTION FEE?

1. Anyone connecting to the sewerage system for the first time for any structure located on a parcel(s) of land within a County Sanitation District of Los Angeles County.
2. Anyone increasing the quantity of wastewater discharged due to the construction of additional dwelling units on or a change in land usage of a parcel already connected to the sewerage system.
3. Anyone increasing the improvement square footage of a commercial or institutional parcel by more than 25 percent.
4. Anyone increasing the quantity and/or strength of wastewater from an industrial parcel.
5. If you qualify for an Ad Valorem Tax or Demolition Credit, connection fee will be adjusted accordingly.

II. HOW ARE THE CONNECTION FEES USED?

The connection fees are used to provide additional conveyance, treatment, and disposal facilities (capital facilities) which are made necessary by new users connecting to a Sanitation District's sewerage system or by existing users who significantly increase the quantity or strength of their wastewater discharge. The Connection Fee Program insures that all users pay their fair share for any necessary expansion of the system.

III. HOW MUCH IS MY CONNECTION FEE?

Your connection fee can be determined from the Connection Fee Schedule specific to the Sanitation District in which your parcel(s) to be connected is located. A Sanitation District boundary map is attached to each corresponding Sanitation District Connection Fee Schedule. Your City or County sewer permitting office has copies of the Connection Fee Schedule(s) and Sanitation District boundary map(s) for your parcel(s). If you require verification of the Sanitation District in which your parcel is located, please call the Sanitation Districts' information number listed under Item IX below.

IV. WHAT FORMS ARE REQUIRED*?

The Connection Fee application package consists of the following:

1. Information Sheet for Applicants (this form)
2. Application for Sewer Connection

3. Connection Fee Schedule with Sanitation District Map (one schedule for each Sanitation District)

*Additional forms are required for Industrial Dischargers.

V. WHAT DO I NEED TO FILE?

1. Completed Application Form
2. A complete set of architectural blueprints (not required for connecting one single family home)
3. Fee Payment (checks payable to: County Sanitation Districts of Los Angeles County)
4. Industrial applicants must file additional forms and follow the procedures as outlined in the application instructions

VI. WHERE DO I SUBMIT THE FORMS?

Residential, Commercial, and Institutional applicants should submit the above listed materials either by mail or in person to:

County Sanitation Districts of Los Angeles County
Connection Fee Program, Room 130
1955 Workman Mill Road
Whittier, CA 90601

Industrial applicants should submit the appropriate materials directly to the City or County office which will issue the sewer connection permit.

VII. HOW LONG DOES IT TAKE TO PROCESS MY APPLICATION?

Applications submitted by mail are generally processed and mailed within three working days of receipt. Applications brought in person are processed on the same day provided the application, supporting materials, and fee is satisfactory. Processing of large and/or complex projects may take longer.

VIII. HOW DO I OBTAIN MY SEWER PERMIT TO CONNECT?

An approved Application for Sewer Connection will be returned to the applicant after all necessary documents for processing have been submitted. Present this approved-stamped copy to the City or County Office issuing sewer connection permits for your area at the time you apply for actual sewer hookup.

IX. HOW CAN I GET ADDITIONAL INFORMATION?

If you require assistance or need additional information, please call the County Sanitation Districts of Los Angeles County at (562) 699-7411, extension 2727.

X. WHAT ARE THE DISTRICTS' WORKING HOURS?

The Districts' offices are open between the hours of 7:00 a.m. and 4:00 p.m., Monday through Thursday, and between the hours of 7:00 a.m. and 3:00 p.m. on Friday, except holidays. When applying in person, applicants must be at the Connection Fee counter at least 30 minutes before closing time.

Department of Toxic Substances Control

Terry Tamminen
Agency Secretary
Cal/EPA

1011 North Grandview Avenue
Glendale, California 91201

Arnold Schwarzenegger
Governor

RECEIVED
NOV 18 2004

November 16, 2004

Dr. Hsiao-ching Chen, AICP
Los Angeles County Regional Planning Department
Impact Analysis Section
320 West Temple Street, Room 1348
Los Angeles, California 90012

NOTICE OF PREPARATION DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE SKYLINE RANCH PROJECT, PROJECT NO. 03-075, TRACT NO. 060922, SCH NO. 2004101090

Dear Dr. Chen:

The Department of Toxic Substances Control (DTSC) has received your Notice of Preparation of a draft Environmental Impact Report (EIR) for the project mentioned above.

Based on the review of the document, DTSC comments are as follows:

1. The draft EIR needs to identify and determine whether current or historic uses at the Project site have resulted in any release of hazardous wastes/substances at the Project area.

2. The draft EIR needs to identify any known or potentially contaminated site within the Project area. For all identified sites, the draft EIR needs to evaluate whether conditions at the site pose a threat to human health or the environment.

3. The draft EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may require remediation, and which government agency will provide appropriate regulatory oversight.

4. If during construction of the project, soil contamination is suspected, construction in the area should stop, and appropriate health and safety procedures should be implemented. If it is determined that contaminated soils exists, the draft EIR should identify how any required investigation and/or remediation will be conducted, and which government agency will provide regulatory oversight.

Printed on Recycled Paper

DTSC provides guidance for Preliminary Endangerment Assessment preparation and cleanup oversight through the Voluntary Cleanup Program (VCP). For additional information on the VCP please visit DTSC's web site at www.dtsc.ca.gov. If you would like to meet and discuss this matter further, please contact Mr. Alberto Valmidiano, Project Manager, at (818) 551-2870 or me, at (818) 551-2857.

Sincerely,

Michel Iskarous
Acting Unit Chief
Southern California Cleanup Operations Branch – Glendale Office

cc: Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044

Mr. Guenther W. Moskat, Chief
Planning and Environmental Analysis Section
CEQA Tracking Center
Department of Toxic Substances Control
P.O. Box 806
Sacramento, California 95812-0806

State of California – The Resources Agency

ARNOLD SCHWARZENEGGER, *Governor*

DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
4949 Viewridge Avenue
San Diego, CA 92123
(858) 467-4201

RECEIVED
NOV 17 2004

November 15, 2004

Ms. Hsiao-ching Chen
Los Angeles County Department of Regional Planning
320 W. Temple Street
Los Angeles, CA 90012

Notice of Preparation for an Environmental Impact Report for Skyline Ranch Project, Project # 03-075 SCH# 2004101090, Los Angeles County

Dear Ms Chen:

The Department of Fish and Game (Department) appreciates this opportunity to comment on the above-referenced project, relative to impacts to biological resources. The proposed project involves the development of 592 acres of the site with 1,325 single-family residences and a ten acre school. Approximately 1,604 acres of the site is proposed for protected open space. The project site supports habitat for listed species, species of Special Concern, seven vegetative communities and a large vernal pool at Cruzan Mesa (located within a Los Angeles County proposed Significant Ecological Area). Plum Canyon drainage and its tributary are also identified within the subject project site. The majority of the site is undeveloped and is located near the intersection of Sierra Highway and Plum Canyon Road near the City of Santa Clarita, Los Angeles County.

To enable Department staff to adequately review and comment on the proposed project we recommend the following information, where applicable, be included in the Draft Environmental Impact Report:

1. A complete, recent assessment of flora and fauna within and adjacent to the project area, with particular emphasis upon identifying endangered, threatened, and locally unique species and sensitive habitats.

    a. A thorough recent assessment of rare plants and rare natural communities, following the Department's Guidelines for Assessing Impacts to Rare Plants and Rare Natural Communities (Attachment 1).

    b. A complete, recent assessment of sensitive fish, wildlife, reptile, and amphibian species. Seasonal variations in use of the project area should also be addressed. Recent, focused, species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with the Department and U.S. Fish and Wildlife Service.

c. Rare, threatened, and endangered species to be addressed should include all those which meet the California Environmental Quality Act (CEQA) definition (see CEQA Guidelines, Section 15380).

d. The Department's California Natural Diversity Data Base in Sacramento should be contacted at (916) 327-5960 to obtain current information on any previously reported sensitive species and habitats, including Significant Natural Areas identified under Chapter 12 of the Fish and Game Code. Also, any Significant Ecological Areas (SEAs) or Environmentally Sensitive Habitats (ESHs) or any areas that are considered sensitive by the local jurisdiction that are located in or adjacent to the project area must be addressed.

2. A thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources, with specific measures to offset such impacts. This discussion should focus on maximizing avoidance, and minimizing impacts.

a. CEQA Guidelines, Section 15125(a), direct that knowledge of the regional setting is critical to an assessment of environmental impacts and that special emphasis should be placed on resources that are rare or unique to the region.

b. Project impacts should also be analyzed relative to their effects on off-site habitats and populations. Specifically, this should include nearby public lands, open space, adjacent natural habitats, and riparian ecosystems. Impacts to and maintenance of wildlife corridor/movement areas, including access to undisturbed habitat in adjacent areas, should be fully evaluated and provided. The analysis should also include a discussion of the potential for impacts resulting from such effects as increased vehicle traffic and outdoor artificial lighting.

c. A cumulative effects analysis should be developed as described under CEQA Guidelines, Section 15130. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to their impacts on similar plant communities and wildlife habitats.

d. Impacts to migratory wildlife affected by the project should be fully evaluated. This can include such elements as migratory butterfly roost sites and neo-tropical bird and waterfowl stop-over and staging sites. All migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R. Section 10.13). Sections 3503, 3503.5 and 3513 of the California Fish and Game Code prohibit take of birds and their active nests, including raptors and other migratory nongame birds as listed under the MBTA.

e. Impacts to all habitats from City or County required Fuel Modification Zones (FMZ). Areas slated as mitigation for loss of habitat shall not occur within the FMZ.

f. Proposed project activities (including disturbances to vegetation) should take place outside of the breeding bird season (February 1- September 15) to avoid take (including disturbances which would cause abandonment of active nests containing eggs and/or young). If project activities cannot avoid the breeding bird season, nest surveys should be conducted and active nests should be avoided and provided with a minimum buffer as determined by a biological monitor (the Department recommends a minimum 500-foot buffer for all active raptor nests).

g. Night lighting, and reflective surfaces pose a hazard to resident and migrant birds

species. These impacts are often overlooked during project planning and design. The DEIR should discuss measures to avoid/minimize these additional project related threats to avian species.

3. A range of alternatives should be analyzed to ensure that alternatives to the proposed project are fully considered and evaluated. A range of alternatives which avoid or otherwise minimize impacts to sensitive biological resources including wetlands/riparian habitats, alluvial scrub, coastal sage scrub, native woodlands, etc. should be included. Specific alternative locations should also be evaluated in areas with lower resource sensitivity where appropriate.

   a. Mitigation measures for project impacts to sensitive plants, animals, and habitats should emphasize evaluation and selection of alternatives which avoid or otherwise minimize project impacts. Compensation for unavoidable impacts through acquisition and protection of high quality habitat elsewhere should be addressed.

   b. The Department considers Rare Natural Communities as threatened habitats having both regional and local significance. Thus, these communities should be fully avoided and otherwise protected from project-related impacts (Attachment 2).

   c. The Department generally does not support the use of relocation, salvage, and/or transplantation as mitigation for impacts to rare, threatened, or endangered species. Department studies have shown that these efforts are experimental in nature and largely unsuccessful.

4. A California Endangered Species Act (CESA) Permit must be obtained, if the project has the potential to result in "take" of species of plants or animals listed under CESA, either during construction or over the life of the project. CESA Permits are issued to conserve, protect, enhance, and restore State-listed threatened or endangered species and their habitats. Early consultation is encouraged, as significant modification to the proposed project and mitigation measures may be required in order to obtain a CESA Permit. Revisions to the Fish and Game Code, effective January 1998, require that the Department issue a separate CEQA document for the issuance of a CESA permit unless the project CEQA document addresses all project impacts to listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of a CESA permit. For these reasons, the following information is requested:

   a. Biological mitigation monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA Permit.

   b. A Department-approved Mitigation Agreement and Mitigation Plan are required for plants listed as rare under the Native Plant Protection Act.

5. The Department opposes the elimination of watercourses and/or their channelization or conversion to subsurface drains. All wetlands and watercourses, whether intermittent, ephemeral, or perennial, must be retained and provided with substantial setbacks which preserve the riparian and aquatic habitat values and maintain their value to on-site and off-site wildlife populations.

   a. The Department requires a Streambed Alteration Agreement (SAA), pursuant to Section 1600 et seq. of the Fish and Game Code, with the applicant prior to any direct or indirect impact to a lake or stream bed, bank or channel or associated riparian resources. The Department's issuance of a SAA may be a project that is subject to CEQA. To facilitate our issuance of the Agreement when CEQA applies, the

Department as a responsible agency under CEQA may consider the local jurisdiction's (lead agency) document for the project. To minimize additional requirements by the Department under CEQA the document should fully identify the potential impacts to the lake, stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the Agreement. Early consultation is recommended, since modification of the proposed project may be required to avoid or reduce impacts to fish and wildlife resources.

The Department suggests a pre-project or early consultation planning meeting for all projects. To make an appointment, please call Scott Harris, Wildlife Biologist, at (626) 797-3170. Thank you for this opportunity to provide comment.

Sincerely,

C. F. Raysbrook
Regional Manager

Attachments

cc: Ms. Morgan Wehtje
Mr. Scott Harris
Ms. Betty Courtney
Department of Fish & Game
Mr. Scott Morgan
State Clearinghouse

HCP-Chron
Department of Fish and Game

SPH:sph

SOUTHERN CALIFORNIA

ASSOCIATION of GOVERNMENTS

Main Office

818 West Seventh Street

12th Floor

Los Angeles, California

90017-3435

t (213) 236-1800

f (213) 236-1825

www.scag.ca.gov

Officers: President: Councilmember Ron Roberts, Temecula • First Vice President: Supervisor Hank Kuiper, Imperial County • Second Vice President: Mayor Toni Young, Port Hueneme • Immediate Past President: Councilmember Bev Perry, Brea

Imperial County: Hank Kuiper, Imperial County • Jo Shields, Brawley

Los Angeles County: Yvonne Brathwaite Burke, Los Angeles County • Zev Yaroslavsky, Los Angeles County • Jim Aldinger, Manhattan Beach • Harry Baldwin, San Gabriel • Paul Bowlen, Cerritos • Tony Cardenas, Los Angeles • Margaret Clark, Rosemead • Gene Daniels, Paramount • Mike Dispenza, Palmdale • Judy Dunlap, Inglewood • Rae Gabelich, Long Beach • Eric Garcetti, Los Angeles • Wendy Greuel, Los Angeles • Frank Gurulé, Cudahy • James Hahn, Los Angeles • Janice Hahn, Los Angeles • Isadore Hall, Compton • Tom LaBonge, Los Angeles • Martin Ludlow, Los Angeles • Keith McCarthy, Downey • Llewellyn Miller, Claremont • Cindy Miscikowski, Los Angeles • Paul Nowatka, Torrance • Pam O'Connor, Santa Monica • Alex Padilla, Los Angeles • Bernard Parks, Los Angeles • Jan Perry, Los Angeles • Beatrice Proo, Pico Rivera • Ed Reyes, Los Angeles • Greig Smith, Los Angeles• Dick Stanford, Azusa • Tom Sykes, Walnut • Paul Talbot, Alhambra • Sidney Tyler, Pasadena • Tonia Reyes Uranga, Long Beach • Antonio Villaraigosa, Los Angeles • Dennis Washburn, Calabasas • Jack Weiss, Los Angeles • Bob Yousefian, Glendale • Dennis Zine, Los Angeles

Orange County: Chris Norby, Orange County • Lou Bone, Tustin • Art Brown, Buena Park • Richard Chavez, Anaheim • Debbie Cook, Huntington Beach • Cathryn DeYoung, Laguna Niguel • Richard Dixon, Lake Forest • Alta Duke, La Palma • Bev Perry, Brea • Marilyn Poe, Los Alamitos • Tod Ridgeway, Newport Beach

Riverside County: Marion Ashley, Riverside County • Thomas Buckley, Lake Elsinore • Bonnie Flickinger, Moreno Valley • Ron Loveridge, Riverside • Greg Pettis, Cathedral City • Ron Roberts, Temecula

San Bernardino County: Paul Biane, San Bernardino County • Bill Alexander, Rancho Cucamonga • Edward Burgnon, Town of Apple Valley • Lawrence Dale, Barstow • Lee Ann Garcia, Grand Terrace • Susan Longville, San Bernardino • Gary Ovitt, Ontario • Deborah Robertson, Rialto

Ventura County: Judy Mikels, Ventura County • Glen Becerra, Simi Valley • Carl Morehouse, San Buenaventura • Toni Young, Port Hueneme

Orange County Transportation Authority: Charles Smith, Orange County

Riverside County Transportation Commission: Robin Lowe, Hemet

Ventura County Transportation Commission: Bill Davis, Simi Valley

Printed on Recycled Paper 559-9/07/04

RECEIVED
NOV 24 2004

November 23, 2004

Dr. Hsiao-ching Chen, AICP
Impact Analysis Section
Los Angeles County
Department of Regional Planning
320 W. Temple Street, Room 1348
Los Angeles, CA 90012

RE: **Comments on the Notice of Preparation for a Draft Environmental Impact Report for the Skyline Ranch Project – SCAG No. I 20040723**

Dear Dr. Chen:

Thank you for submitting the **Notice of Preparation for a Draft Environmental Impact Report for the Skyline Ranch Project** to SCAG for review and comment. As areawide clearinghouse for regionally significant projects, SCAG reviews the consistency of local plans, projects, and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies.

We have reviewed the **Notice of Preparation**, and have determined that **the proposed Project is regionally significant per California Environmental Quality Act (CEQA) Guidelines (Section 15206).** The proposed Project considers the construction of more than 500 dwelling units. CEQA requires that EIRs discuss any inconsistencies between the proposed project and the applicable general plans and **regional plans (Section 15125 [d]).** If there are inconsistencies, an explanation and rationalization for such inconsistencies should be provided.

Policies of SCAG's Regional Comprehensive Plan and Guide and Regional Transportation Plan, which may be applicable to your project, are outlined in the attachment. **We expect the Draft EIR to specifically cite the appropriate SCAG policies and address the manner in which the Project is consistent with applicable core policies or supportive of applicable ancillary policies. Please use our policy numbers to refer to them in your Draft EIR. Also, we would encourage you to use a side-by-side comparison of SCAG policies with a discussion of the consistency or support of the policy with the Proposed Project.**

Please provide a minimum of 45 days for SCAG to review the Draft EIR when this document is available. If you have any questions regarding the attached comments, please contact me at (213) 236-1867. Thank you.

Sincerely,

JEFFREY M. SMITH, AICP
Senior Regional Planner
Intergovernmental Review

COMMENTS ON THE PROPOSAL TO DEVELOP A DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT FOR THE SKYLINE RANCH PROJECT SCAG NO. I 20040723

PROJECT DESCRIPTION

The proposed Project considers the development of 1,325 single-family residences on approximately 592 acres. The Project will also include a 10-acres school site and 10-acres for a public park. The proposed Project is part of a 2,196 acre project area that is located in the Santa Clarita Valley, west and north of Highway 14 (Antelope Valley Freeway) and north of the City of Santa Clarita in unincorporated Los Angeles County.

CONSISTENCY WITH REGIONAL COMPREHENSIVE PLAN AND GUIDE POLICIES

The **Growth Management Chapter (GMC)** of the Regional Comprehensive Plan and Guide (RCPG) contains the following policies that are particularly applicable and should be addressed in the Draft EIR for the Skyline Ranch Project.

3.01 The population, housing, and jobs forecasts, which are adopted by SCAG's Regional Council and that reflect local plans and policies, shall be used by SCAG in all phases of implementation and review.

Regional Growth Forecasts

The Draft EIR should reflect the most current SCAG forecasts which are the 2004 RTP (April 2004) Population, Household and Employment forecasts for the North Los Angeles County subregion and Unincorporated Los Angeles County. These forecasts are as follows:

NORTH LA SUBREGION	2000	2005	2010	2015	2020	2025
POPULATION	512,391	614,502	735,262	852,964	967,387	1,076,013
HOUSEHOLD	161,131	181,825	221,538	256,966	292,658	327,745
EMPLOYMENT	178,999	182,284	215,955	235,070	253,417	270,409

UNINCORP. LA CO.	2000	2005	2010	2015	2020	2025
POPULATION	1,007,701	1,118,360	1,231,730	1,332,100	1,429,615	1,520,279
HOUSEHOLD	2,81,124	301,345	337,539	371,349	405,520	439,160
EMPLOYMENT	256,474	260,627	303,110	314,852	326,028	336,182

3.03 The timing, financing, and location of public facilities, utility systems, and transportation systems shall be used by SCAG to implement the region's growth policies.

GMC POLICIES RELATED TO THE RCPG GOAL TO IMPROVE THE REGIONAL STANDARD OF LIVING

The Growth Management goals to develop urban forms that enable individuals to spend less income on housing cost, that minimize public and private development costs, and that enable firms to be more competitive, strengthen the regional strategic goal to stimulate the regional economy. The evaluation of the proposed project in relation to the following policies would be intended to guide efforts toward achievement of such goals and does not infer regional interference with local land use powers.

3.05 Encourage patterns of urban development and land use, which reduce costs on infrastructure construction and make better use of existing facilities.

3.09 Support local jurisdictions' efforts to minimize the cost of infrastructure and public service delivery, and efforts to seek new sources of funding for development and the provision of services.

3.10 Support local jurisdictions' actions to minimize red tape and expedite the permitting process to maintain economic vitality and competitiveness.

GMC POLICIES RELATED TO THE RCPG GOAL TO IMPROVE THE REGIONAL QUALITY OF LIFE

The Growth Management goals to attain mobility and clean air goals and to develop urban forms that enhance quality of life, that accommodate a diversity of life styles, that preserve open space and natural resources, and that are aesthetically pleasing and preserve the character of communities, enhance the regional strategic goal of maintaining the regional quality of life. The evaluation of the proposed project in relation to the following policies would be intended to provide direction for plan implementation, and does not allude to regional mandates.

3.12 Encourage existing or proposed local jurisdictions' programs aimed at designing land uses which encourage the use of transit and thus reduce the need for roadway expansion, reduce the number of auto trips and vehicle miles traveled, and create opportunities for residents to walk and bike.

3.14 Support local plans to increase density of future development located at strategic

points along the regional commuter rail, transit systems, and activity centers.

3.17 Support and encourage settlement patterns, which contain a range of urban densities

3.18 Encourage planned development in locations least likely to cause environmental impact.

3.19 SCAG shall support policies and actions that preserve open space areas identified in local, state and federal plans.

3.20 Support the protection of vital resources such as wetlands, groundwater recharge areas, woodlands, production lands, and land containing unique and endangered plants and animals.

3.21 Encourage the implementation of measures aimed at the preservation and protection of recorded and unrecorded cultural resources and archaeological sites.

3.22 Discourage development, or encourage the use of special design requirements, in areas with steep slopes, high fire, flood, and seismic hazards.

3.23 Encourage mitigation measures that reduce noise in certain locations, measures aimed at preservation of biological and ecological resources, measures that would reduce exposure to seismic hazards, minimize earthquake damage, and to develop emergency response and recovery plans.

GMC POLICIES RELATED TO THE RCPG GOAL TO PROVIDE SOCIAL, POLITICAL, AND CULTURAL EQUITY

The Growth Management Goal to develop urban forms that avoid economic and social polarization promotes the regional strategic goal of minimizing social and geographic disparities and of reaching equity among all segments of society. The evaluation of the proposed project in relation to the policy stated below is intended guide direction for the accomplishment of this goal, and does not infer regional mandates and interference with local land use powers.

3.24 Encourage efforts of local jurisdictions in the implementation of programs that increase the supply and quality of housing and provide affordable housing as evaluated in the Regional Housing Needs Assessment.

3.27 Support local jurisdictions and other service providers in their efforts to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social

services, recreational facilities, law enforcement, and fire protection.

REGIONAL TRANSPORTATION PLAN

The **2004 Regional Transportation Plan (RTP)** also has goals and policies that are pertinent to this proposed project. This RTP links the goal of sustaining mobility with the goals of fostering economic development, enhancing the environment, reducing energy consumption, promoting transportation-friendly development patterns, and encouraging fair and equitable access to residents affected by socio-economic, geographic and commercial limitations. The RTP continues to support all applicable federal and state laws in implementing the proposed project. Among the relevant goals and policies of the RTP are the following:

Regional Transportation Plan Goals

- Maximize mobility and accessibility for all people and goods in the region.
- Ensure travel safety and reliability for all people and goods in the region.
- Preserve and ensure a sustainable regional transportation system.
- Maximize the productivity of our transportation system.
- Protect the environment, improve air quality and promote energy efficiency.
- Encourage land use and growth patterns that complement our transportation investments.

Regional Transportation Plan Policies

- Transportation investments shall be based on SCAG's adopted Regional Performance Indicators.

Performance Indicator	Performance Measures	Definition	Performance Outcome
Mobility	• Average Daily Speed • Average Daily Delay	Speed-experienced by travelers regardless of mode. Delay-excess travel time resulting from the difference between a reference speed and actual speed. Total daily delay and daily delay per capita are indicators used.	10% Improvement 40% Improvement
Accessibility	• Percent PM peak work trips within 45 minutes of home • Distribution of work trip travel times		Auto 90% Transit 37% Auto 8% Improvement Transit 8% Improvement
Reliability	• Percent variation in travel time	Day-to-day change in travel times experienced by travelers. Variability results from accidents, weather, road closures, system problems and other non-recurrent conditions.	10% Improvement
Safety	• Accident Rates	Measured in accidents per million	0.3% Improvement

		vehicle miles by mode.	
Performance Indicator	**Performance Measures**	**Definition**	**Performance Outcome**
Cost Effectiveness	• Benefit-to-Cost (B/C) Ratio	Ratio of benefits of RTP investments to the associated investments costs.	$3.08
Productivity	• Percent capability utilized during peak conditions	Transportation infrastructure capacity and services provided. • Roadway Capacity - vehicles per hour per lane by type of facility. • Transit Capacity – seating capacity utilized by mode.	20% Improvement at known bottlenecks N/A
Sustainability	• Total cost per capita to sustain current system performance	Focus in on overall performance, including infrastructure condition Preservation measure is a sub-set of sustainability.	$20 per capita, primarily in preservation costs
Preservation	• Maintenance cost per capita to preserve system at base year conditions	Focus is on infrastructure condition. Sub-set of sustainability.	Maintain current conditions
Environmental	• Emissions generated by travel	Measured/forecast emissions include CO, NOX, PM10, SOX and VOC. CO2 as secondary measure to reflect greenhouse emissions.	Meets conformity requirements
Environmental Justice	• Expenditures by quintile and ethnicity • Benefit vs. burden by quintiles	Proportionate share of expenditures in the 2004 RTP by each quintile. Proportionate share of benefits to each quintile ethnicity. Proportionate share of additional airport noise by ethnic group.	No disproportionate impact to any group or quintile

- Ensuring safety, adequate maintenance, and efficiency of operations on the existing multi-modal transportation system will be RTP priorities and will be balanced against the need for system expansion investments.

- RTP land use and growth strategies that differ from currently expected trends will require a collaborative implementation program that identifies required actions and policies by all affected agencies and sub-regions.

- HOV gap closures that significantly increase transit and rideshare usage will be supported and encouraged, subject to Policy #1.

AIR QUALITY CHAPTER CORE ACTIONS

The **Air Quality Chapter** core actions related to the proposed project includes:

5.07 *Determine specific programs and associated actions needed (e.g., indirect source rules, enhanced use of telecommunications, provision of community based shuttle services, provision of demand management based programs, or vehicle-miles-traveled/emission fees) so that options to command and control regulations can be assessed.*

5.11 *Through the environmental document review process, ensure that plans at all levels of government (regional, air basin, county, subregional and local) consider air quality, land use, transportation and economic relationships to ensure consistency and minimize conflicts.*

OPEN SPACE CHAPTER ANCILLARY GOALS

Outdoor Recreation

9.01 *Provide adequate land resources to meet the outdoor recreation needs of the present and future residents in the region and to promote tourism in the region.*

9.02 *Increase the accessibility to open space lands for outdoor recreation.*

9.03 *Promote self-sustaining regional recreation resources and facilities.*

Public Health and Safety

9.04 *Maintain open space for adequate protection of lives and properties against natural and man-made hazards.*

9.05 *Minimize potentially hazardous developments in hillsides, canyons, areas susceptible to flooding, earthquakes, wildfire and other known hazards, and areas with limited access for emergency equipment.*

Resource Production

9.07 *Maintain adequate viable resource production land, particularly lands devoted to commercial agriculture and mining operations.*

Resource Protection

9.08 Develop well-managed viable ecosystems or known habitats of rare, threatened and endangered species, including wetlands.

WATER QUALITY CHAPTER RECOMMENDATIONS AND POLICY OPTIONS

The **Water Quality Chapter** core recommendations and policy options relate to the two water quality goals: to restore and maintain the chemical, physical and biological integrity of the nation's water; and, to achieve and maintain water quality objectives that are necessary to protect all beneficial uses of all waters.

11.07 Encourage water reclamation throughout the region where it is cost-effective, feasible, and appropriate to reduce reliance on imported water and wastewater discharges. Current administrative impediments to increased use of wastewater should be addressed.

GROWTH VISIONING

The fundamental goal of the Growth Visioning effort is to make the SCAG region a better place to live, work and play for all residents regardless of race, ethnicity or income class. Thus, decisions regarding growth, transportation, land use, and economic development should be made to promote and **sustain** for future generations the region's **mobility**, **livability** and **prosperity**. The following "Regional Growth Principles" are proposed to provide a framework for local and regional decision making that improves the quality of life for all SCAG residents. Each principle is followed by a specific set of strategies intended to achieve this goal.

Principle 1: Improve **mobility** for all residents

- Encourage transportation investments and land use decisions that are mutually supportive.
- Locate new housing near existing jobs and new jobs near existing housing.
- Encourage transit-oriented development.
- Promote a variety of travel choices

Principle 2: Foster **livability** in all communities

- Promote infill development and redevelopment to revitalize existing communities.
- Promote developments, which provide a mix of uses.
- Promote "people scaled," walkable communities.
- Support the preservation of stable, single-family neighborhoods.

Principle 3: Enable **prosperity** for all people

- Provide, in each community, a variety of housing types to meet the housing needs of all income levels.
- Support educational opportunities that promote balanced growth.
- Ensure environmental justice regardless of race, ethnicity or income class.
- Support local and state fiscal policies that encourage balanced growth
- Encourage civic engagement.

Principle 4: Promote **sustainability** for future generations

- Preserve rural, agricultural, recreational and environmentally sensitive areas.
- Focus development in urban centers and existing cities.
- Develop strategies to accommodate growth that uses resources efficiently, eliminate pollution and significantly reduce waste.
- Utilize "green" development techniques.

CONCLUSIONS

All feasible measures needed to mitigate any potentially negative regional impacts associated with the proposed project should be implemented and monitored, as required by CEQA.

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

Roles and Authorities

THE SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS (SCAG) is a ***Joint Powers Agency*** established under California Government Code Section 6502 et seq. Under federal and state law, SCAG is designated as a Council of Governments (COG), a Regional Transportation Planning Agency (RTPA), and a Metropolitan Planning Organization (MPO). SCAG's mandated roles and responsibilities include the following:

SCAG is designated by the federal government as the Region's ***Metropolitan Planning Organization*** and mandated to maintain a continuing, cooperative, and comprehensive transportation planning process resulting in a Regional Transportation Plan and a Regional Transportation Improvement Program pursuant to 23 U.S.C. '134, 49 U.S.C. '5301 et seq., 23 C.F.R. '450, and 49 C.F.R. '613. SCAG is also the designated ***Regional Transportation Planning Agency***, and as such is responsible for both preparation of the Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP) under California Government Code Section 65080 and 65082 respectively.

SCAG is responsible for developing the demographic projections and the integrated land use, housing, employment, and transportation programs, measures, and strategies portions of the ***South Coast Air Quality Management Plan***, pursuant to California Health and Safety Code Section 40460(b)-(c). SCAG is also designated under 42 U.S.C. '7504(a) as a ***Co-Lead Agency*** for air quality planning for the Central Coast and Southeast Desert Air Basin District.

SCAG is responsible under the Federal Clean Air Act for determining ***Conformity*** of Projects, Plans and Programs to the State Implementation Plan, pursuant to 42 U.S.C. '7506.

Pursuant to California Government Code Section 65089.2, SCAG is responsible for ***reviewing all Congestion Management Plans (CMPs) for consistency with regional transportation plans*** required by Section 65080 of the Government Code. SCAG must also evaluate the consistency and compatibility of such programs within the region.

SCAG is the authorized regional agency for ***Inter-Governmental Review*** of Programs proposed for federal financial assistance and direct development activities, pursuant to Presidential Executive Order 12,372 (replacing A-95 Review).

SCAG reviews, pursuant to Public Resources Code Sections 21083 and 21087, Environmental Impacts Reports of projects of regional significance for consistency with regional plans [California Environmental Quality Act Guidelines Sections 15206 and 15125(b)].

Pursuant to 33 U.S.C. '1288(a)(2) (Section 208 of the Federal Water Pollution Control Act), SCAG is the authorized ***Areawide Waste Treatment Management Planning Agency***.

SCAG is responsible for preparation of the ***Regional Housing Needs Assessment***, pursuant to California Government Code Section 65584(a).

SCAG is responsible (with the Association of Bay Area Governments, the Sacramento Area Council of Governments, and the Association of Monterey Bay Area Governments) for preparing the ***Southern California Hazardous Waste Management Plan*** pursuant to California Health and Safety Code Section 25135.3.

Revised July 2001

COUNTY OF LOS ANGELES
DEPARTMENT OF PARKS AND RECREATION

November 30, 2004

TO: Ms. Hsiao-ching Chen
Department of Regional Planning
Impact Analysis Section

FROM: Larry Hensley
Planning Division Chief

SUBJECT: **NOTICE OF PREPARATION**
"Skyline Ranch" Project
County Project No. 04-075/Tract Map No. 060922

The Department of Parks and Recreation has reviewed the Notice of Preparation for the preparation of an Environmental Impact Report for the proposed Skyline Ranch project. We concur with the finding that the proposed project could require new or expanded recreational facilities for future residents. Some of our specific concerns are as follows:

- Provide local parks for the enjoyment and leisure of the proposed development by meeting the standard established in the County's General Plan of four (4) acres per thousand population*. The Department understands that local parkland has been designated for implementation in lots 1343 and 1344 per the March 9, 2004 map.

- Provide regional park facilities for the enjoyment of the residents in the larger Santa Clarita Valley area by meeting the standard of six (6) acres per thousand population* as established in the County's General Plan. This could take several forms including but not to limited trails, trail heads, and additional facilities for the William S. Hart Regional Park or Vasquez Rocks Natural Area Park.

- The Mint Canyon Trail appears to be within the project boundary, however, that is still subject to field verification.

* Population (approximately 4,250) based on the anticipated growth relating to the number of projected dwelling units within the development.

If you have any questions, please contact me at (213) 351-5098.

LH:bm(c:response-skylineranch)

c: Gil Lopez, Parks and Recreation
James Barber, Parks and Recreation
Joan Rupert, Parks and Recreation
Bryan Moscardini, Parks and Recreation

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
www.ladpw.org

RECEIVED
DEC 14 2004

December 7, 2004

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

IN REPLY PLEASE
REFER TO FILE: LD-0

TO: Daryl Koutnik
Department of Regional Planning

Attention Hsiao-Ching Chen

FROM: Dennis Hunter
Land Development Division

RESPONSE TO A NOTICE OF PREPARATION
SKYLINE RANCH PROJECT
PROJECT NO. 04-075/TRACT NO. 060922

We have reviewed the Notice of Preparation for the Skyline Ranch Project and offer the following comments for your consideration in preparing the Draft Environmental Impact Report (DEIR).

Geotechnical

The geotechnical report should include a topographic map identifying grading activities, geotechnical hazards, and a detailed discussion of any mitigation measures. A liquefaction analysis and seismic slope analyses are not warranted at this time. However, detailed liquefaction and seismic slope stability analyses, conforming to the requirements of the State of California Division of Mines and Geology "Special Publication 117," must be conducted at the tentative map and/or grading/building plan stages.

Drainage/Water Quality

Our records indicate that a drainage concept was previously prepared for this project and we have since returned comments. Following submission, review, and approval of the revised drainage concept, the results of the final approved report should be included in the DEIR.

The DEIR should discuss the impacts of the encroachments on the floodplain/floodway near the Skyline Ranch Road and Sierra Highway intersection. Because this encroachment has the potential to raise the base flood elevations, the analysis needs to document the finished floor elevations of existing structures. The finished floor elevations of the existing structures must remain below the base flood elevations.

Also, the project includes the construction of debris basins. Periodic cleanouts of these facilities are necessary to maintain design capacity. Cleanout activities entail operation of equipment within the basin and truck traffic to haul the material away. The DEIR should discuss the periodic removal of vegetation as part of the sediment removal. If regulatory agencies determine these basins fall within their jurisdiction, maintenance plans and permits will be required prior to these facilities being accepted for public maintenance. The DEIR should also address the long-term sediment management impacts by determining the average annual sediment basin entrapment and where this material will be placed over the life of the project. This development may negatively impact the County's sediment management infrastructure.

Traffic/Access

The proposed project has the potential to significantly impact the County and County/City roadways and intersections in the area, as well as freeways under the jurisdiction of Caltrans. (Please see attached Caltran's letter dated July 20, 2004.) We would like the opportunity to review the related environmental document and traffic studies upon their completion. The County's methodology shall be used when evaluating the County and/or County/City roadways and intersections. The applicant must confer with Caltrans in order to select the methodology to use when determining the impact to the freeways. 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 and intersections. Upon identifying impact, the traffic study must identify feasible mitigation measures. A copy of the County's Traffic Impact Study Guidelines is attached. Please note that our guidelines reiterate the need of the developer to confer with Caltrans and/or affected cities during the preparation of the traffic study.

Sewage Disposal

A sewer area study shall be submitted to determine if the proposed and existing sewerage system servicing this project have adequate capacity to accept all tributary area sewer discharges. This tributary area shall include, but is not limited to, the proposed flows from the project site and tributary flows from adjacent areas and, if applicable, all other tributary areas beyond the project boundaries. The sewer area study shall be approved by Public Works and/or agencies having jurisdiction of the tributary area. If the system is found to have insufficient capacity, upgrade of the proposed and existing sewerage system is required to the satisfaction of all affected agencies. In addition, the sewer deficiencies shall be addressed in the DEIR.

Also, the Department's Consolidated Sewer Maintenance District maintains the local sanitary sewers within the unincorporated areas of the County. Therefore, the entire sewer system will be required to be annexed to the District. This will be in addition to the Las Virgenes Municipal Water District's requirements.

Solid Waste

The construction, demolition and/or predevelopment activities associated with the proposed project and the postdevelopment operation over the life of the proposed project will increase the generation of solid waste and may negatively impact the solid waste management infrastructure in the County. Therefore, the DEIR should identify what measures the project proponent plans to implement to mitigate the impact. Mitigation measures may include, but are not limited to, implementation of waste reduction and recycling programs to divert the solid waste, including construction and demolition waste and excavated material, from the landfills.

The DEIR should include/discuss standards to provide adequate recyclable storage areas for collection/storage of recyclable and green waste materials for this project's public facilities.

School districts are encouraged to take advantage of special County programs, available through Public Works, by calling (888) CLEAN LA or visiting www.888CleanLA.com.

The proposed project may generate hazardous waste and/or household hazardous waste, which could adversely impact existing hazardous waste management infrastructure. This issue should be addressed and mitigation measures provided. Mitigation measures may include, but are not limited to, providing new homeowners with educational materials on the proper management and disposal of household hazardous waste. The project proponent may contact Public Works for available educational materials by calling 1(888) CLEAN LA.

COMMENTS RELATED TO THE LAND USE PERMIT

The proposed realignment of Whites Canyon Road will require approval by the Board of Supervisors.

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. If the 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, and 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 stormwater treatment facilities, Public Works must be contacted for required approvals and operating permits.

The food service facility at the school, may be required to provide a grease treatment device and will be subject to review and approval by Public Works.

If you have any questions or require additional information, please contact Clarice Nash at (626) 458-5910.

CN:ca:jmw
P:\CEQA\CLARIE\\skyline_ranch.doc

Attach.

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

RECEIVED

2004 JUL 22 AM 5:08

900 S. FREMONT AVE.

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

Mr. James Chon
Department of Public Works
Los Angeles County
900 S. Fremont Ave.
P.O. Box 1460
Alhambra, CA. 91802-1460

IGR/CEQA# 040640NY
TIS/ Skyline Ranch/1,350 Single Family Homes
TT#060922
LA/14/35.71

July 20, 2004
Dear Mr. Chon:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Skyline Ranch/1,350 Single Family Residential Project.

We have reviewed the project's traffic study that you provided. The Department as a responsible 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.

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

We request that you apply the equitable share responsibility formula on page 2 of Appendix B **(Methodology for Calculating Equitable Mitigation Measures)** and set aside a portion of Transportation Impact Fees generated for the future State Highway 14 improvement projects. The County may need to recalculate or establish an additional fee for this purpose.
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 # 040640NY.

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

"Caltrans improves mobility across California"

STATE OF CALIFORNIA–THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, *Governor*

SANTA MONICA MOUNTAINS CONSERVANCY
RAMIREZ CANYON PARK
5750 RAMIREZ CANYON ROAD
MALIBU, CALIFORNIA 90265
PHONE (310) 589-3200
FAX (310) 589-3207

RECEIVED
DEC 20 2004

December 6, 2004

Dr. Hsiao-ching Chen, AICP
Los Angeles County Regional Planning Department
Impact Analysis Section
320 West Temple Street, Room 1348
Los Angeles, California 90012

Notice of Preparation of a Draft Environmental Impact Report Comments
Skyline Ranch Project
Tentative Tract Map No. 060922

Dear Dr. Chen:

The proposed project is located in the upper Santa Clara River watershed, which contains regionally significant ecological, recreational and visual resources. The project site includes the biologically sensitive and significant Cruzan Mesa. Located on the mesa is a vernal pool complex that supports numerous endangered and sensitive species. The vernal pool system is a sensitive, regional resource that must be protected.

Community Facilities District

The land that is to become open space, as identified in the Notice of Preparation (NOP), is a regionally significant resource. Good stewardship must be provided for this open space. A resource management agency that can adequately protect the resources on the property is the only entity that the open space should be dedicated to. The Conservancy's joint powers entity, the Mountains Recreation and Conservation Authority (MRCA), is able to take title to the open space and manage it in a protective capacity.

In order to guarantee the safety of the public visiting the open space dedication and of the new adjoining homeowners, as well as the ecological integrity of the open space, another critical mitigation measure that must be included in the DEIR is a permanent funding mechanism to maintain the property. Dedication of land is only a complete mitigation measure if funding is provided. To our knowledge, a Community Facilities District (CFD) is the optimal method for such a funding source.

A minimum of $35,000 per year with an inflation adjuster must be provided for maintenance of the open space. The open space recipient, such as the MRCA, would be the

beneficiary of the money generated by the CFD each year. The $35,000 would fund two half-day visits to the site per week throughout the year. The money would also fund the maintenance of signage, trails, fencing, protection of the vernal pools, the cleanup of trash, and provide for public safety. The first increment of the CFD must be provided simultaneously with the transfer of the open space. If the resource management agency were to provide brushing on the project site as well, then $40,000 per year must be provided by the CFD.

In addition to the money raised annually by the CFD, the resource management agency must be provided with a minimum of $20,000 for initial site improvements. This money for initial site improvements must be provided simultaneously with the transfer of the open space. The improvements to the site would include gates, fencing, and signage.

Mitigation Measures

The DEIR must include two mitigation measures. The project site and in particular Cruzan Mesa, where the vernal pools are located, has been significantly degraded. This degradation was caused by continual discing of the land surrounding each vernal pool, as well as the filming and grazing activities allowed on the mesa. To mitigate these impacts, the DEIR must include the following measure. All filming and grazing uses not recommended by Los Angeles County biologists be removed from the project site, no more than 60 days after project approval.

To help educate the public about the significant biological resources found on Cruzan Mesa, the DEIR must include the following mitigation measure. The project applicant will provide one-time funding totaling $25,000 to the open space recipient to prepare educational kiosks about the vernal pool ecosystem prior to map recordation or the issuance of grading permits.

Restoration of the Vernal Pool Complex

The biological integrity of the vernal pool ecosystem must be restored. As stated in the above section, the site has been significantly degraded by the uses in that area of the project site. To adequately restore the vernal pool system, a restoration plan must developed. This plan must be approved by Los Angeles County biologists prior to EIR certification. A minimum of $500,000 must be provided to the resource management agency to administer the plan and restore the vernal pools. The restoration fund must be in an escrow account 30 days prior to map recordation or the issuance of a grading permit.

Growth Inducing Impacts

Two inholdings are located in the eastern side of the project site. The DEIR must describe what type of access will be provided to these inholdings. All future environmental impacts must be described. One of the parcels is located within the Cruzan Mesa Significant Ecological Area. To remove any potential for growth inducing impacts, the applicant should buy out the inholdings and include them as part of the open space dedication.

Mint Canyon Creek

The Conservancy is pleased that the project footprint was completely moved off of the mesa. However, the majority of Mint Canyon Creek and its tributaries on the project site will be totally filled in. Mint Canyon Creek is a significant biological resource and must be protected. The footprint should be altered so that the creek is preserved.

The Conservancy appreciates the opportunity to comment. Please direct any questions or future documents to Paul Edelman of our staff at (310) 589-3200 ext. 128 and at the above Ramirez Canyon Park address.

Sincerely,

Jerome C. Daniel

JEROME C. DANIEL
Chairperson

COUNTY OF LOS ANGELES

FIRE DEPARTMENT

1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063-3294

(323) 890-4330

P. MICHAEL FREEMAN
FIRE CHIEF
FORESTER & FIRE WARDEN

December 21, 2004

Mr. Daryl Koutnik
Impact Analysis Section
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Dear Mr. Koutnik:

NOTICE OF PREPARATION/INITIAL STUDY OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE PROPOSED "SKYLINE RANCH" SUBDIVISION PROJECT, COUNTY PROJECT #04-075, TRACT MAP #060922, "SANTA CLARITA VALLEY" -- (EIR #2165/2004)

The Notice of Preparation/Initial Study of a Draft Environmental Impact Report (EIR) for the Skyline Ranch Project" has been reviewed by the Planning Division, Land Development Unit, and Forestry Division of the County of Los Angeles Fire Department. The following are their comments:

PLANNING DIVISION:

Enclosed please find our previous letter regarding this project. In addition to the two fire stations mentioned in that letter, a future station is planned in the vicinity of the intersection of Plum Canyon and Whites Canyon Roads. We reiterate that we would need a detailed, scaled map showing all existing and proposed roads in order to calculate response distances/times.

The DMS analysis concludes that the first-due response distance is adequate, based on the maximum distance criteria for rural density. Since the critical factor for fire containment is structure separation, the relevant density is the density within the developed area, after subtracting the open space. The actual density of this project is thus low-urban, approximately 2.25 dwelling units per acre of development.

The fire camps play a supportive role in wildland fire prevention and suppression. They are not staffed with firefighters and do not respond to incidents in developed areas. They should not be included in an EIR for a land development project.

There are no aid agreements with other fire protection agencies affecting this project.

The developer fee is due and payable at the time a building permit is issued. It is anticipated that the rate will be set at $0.3877 per square foot as of December 1st, 2004. This figure is subject to periodic adjustment.

LAND DEVELOPMENT UNIT:
The Fire Prevention Division, Land Development Unit has no additional comments regarding this project. The conditions that were detailed in the letter dated October 8, 2004, EIR #2088/2004 have not been changed at this time (see enclosed copy of letter).

Should any questions arise regarding subdivision, water systems, or access please contact Inspector Marvin Dorsey at (323) 890-4243.

FORESTRY DIVISION – OTHER ENVIRONMENTAL CONCERNS:
The statutory responsibilities of the County of Los Angeles Fire Department, Forestry Division include erosion control, watershed management, rare and endangered species, vegetation, fuel modification for Very High Fire Hazard Severity Zones or Fire Zone 4, archeological and cultural resources and the County Oak Tree Ordinance. Potential impacts in these areas should be addressed in the Final Environmental Impact Report.

This project will require an EIR fee deposit of $1,000 payable to the Los Angeles County Fire Department at the time the DEIR is submitted for review (see enclosed).

If you have any additional questions, please contact this office at (323) 890-4330.

Very truly yours,

DAVID R. LEININGER, CHIEF, FORESTRY DIVISION
PREVENTION BUREAU

DRL:sc

Enclosures

c: Ms. Lisa Dittman -- Cox Castle Nicholson

bc: Yocum-E/R
Div. III
EIR #2165/Pac.
Land Development
Planning
#219
(EIR #2165.B74)

NOTE: Ms. Lisa Dittman
Cox Castle Nicholson
2049 Century Park East, 28th Floor
Los Angeles, CA 90067

(323) 890-4330

October 8, 2004

Mr. Ned Baldwin
Impact Sciences
30343 Canwood Street, Suite 210
Agoura Hills, CA 91301

Dear Mr. Baldwin:

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE "SYLINE RANCH (TENTATIVE TRACT #060922) PROJECT" – "SANTA CLARITA" (EIR #2088/2004)

The Notice of Preparation of an Environmental Impact Report for the aforementioned proposed project has been reviewed by the Planning Division, Land Development Unit, and Forestry Division of the County of Los Angeles Fire Department. The following are their comments:

PLANNING DIVISION:

The subject development will receive fire protection and paramedic service from the County of Los Angeles Fire Department. Fire Station 107, located at 18239 W. Soledad Canyon Road, is the jurisdictional station for this property. A 3-person engine company and a 2-person paramedic squad are assigned to this station.

The second closest station will be the new Fire Station 104, scheduled to open October 15, 2004. This fire station will be temporarily located at 26622 Golden Valley Road, Santa Clarita 91350. It will house a 4-person quint (a combination engine/ladder truck apparatus).

We would need a detailed map showing the location of proposed land uses as well as existing and proposed roads in order to calculate response distances/times from these and other fire stations in the area.

The County of Los Angeles Consolidated Fire Protection District, also known as the County Fire Department, is not divided into distinct service areas. The entire District is a seamless whole for the purposes of dispatching emergency response units. The closest available units are dispatched as needed to an incident anywhere within its territory.

Any new development will increase the service demand on existing resources. Although this development would be in proximity to an existing fire station, it would increase service demand on the fire protection resources in the general area. Additional manpower, equipment, and facilities are needed in the area now. Limited tax revenues have restricted the Fire Department's ability to meet new growth needs. While general plans have been developed or upgrading fire protection in this area, the Department will not be able to implement these plans without specific

provisions for the necessary manpower, equipment and facilities. Mitigation of this problem should be required prior to granting approval of this development. The Fire Department will work with the developer to establish appropriate mitigation arrangements for the proposed project.

The applicant shall participate in an appropriate financing mechanism, such as a developer fee or an in-kind consideration in lieu of developer fees, to provide funds for fire protection facilities which are required by new commercial, industrial or residential development in an amount proportionate to the demand created by this project. Currently, the developer fee is a set amount per square foot of building space, adjusted annually, and is due and payable at the time a building permit is issued. In the event that the developer fee is no longer in effect at the time of building permit issuance, alternative mitigation measures shall be required.

The environmental document should provide a breakdown of dwelling units by density and type e.g., single-family detached vs. multi-family.

Due to the fact that the information available on this project is limited at the present time, we are not able to respond fully as to how this project will affect our Department. We would like to reserve the right to respond further at a future date when additional information and suitable maps are available.

LAND DEVELOPMENT UNIT/GENERAL REQUIREMENTS:

The proposed development may necessitate multiple ingress/egress access for the circulation of traffic, and emergency response issues. The Department may condition future development to provide additional means of access. The development of this project must comply with all applicable code and ordinance requirements for construction, access, water mains, fire flows and hydrants.

This property is located within the area described by the Forester and Fire Warden as a Fire Zone 4, Very High Fire Hazard Severity Zone (VHFHSZ). All applicable fire code and ordinance requirements for construction, access, water mains, fire hydrants, fire flows, brush clearance and fuel modification plans, must be met.

Specific fire and life safety requirements for the construction phase will be addressed at the building fire plan check. There may be additional fire and life safety requirements during this time. Every building constructed shall be accessible to Fire Department apparatus by way of access roadways, with an all-weather surface of not less than the prescribed width. The roadway shall be extended to within 150 feet of all portions of the exterior walls when measured by an unobstructed route around the exterior of the building.

Access roads shall be maintained with a minimum of ten (10) feet of brush clearance on each side. Fire access roads shall have an unobstructed vertical clearance clear-to-sky with the exception of protected tree species. Protected tree species overhanging fire access roads shall be maintained to provide a vertical clearance of 13 feet, 6 inches.

The maximum allowable grade shall not exceed 15% except where topography makes it impractical to keep within such grade; in such cases, an absolute maximum of 20% will be allowed for up to 150 feet in distance. The average maximum allowed grade including topographical difficulties shall be no more than 17%. Grade breaks shall not exceed 10% in ten (10) feet.

When involved with a subdivision in unincorporated areas within the County of Los Angeles Fire Department, requirements for access, fire flows and hydrants are addressed at the Los Angeles County Subdivision Committee meeting during the subdivision tentative map stage.

Fire sprinkler systems are required in some residential and most commercial occupancies. For those occupancies not requiring fire sprinkler systems, it is strongly suggested that fire sprinkler systems be installed. This will reduce potential fire and life losses. Systems are now technically and economically feasible for residential use.

INSTITUTIONAL:
The development may require fire flows up to 8,000 gallons per minute at 20 pounds per square inch residual pressure for up to a four-hour duration as outlined in the 2002 County of Los Angeles Fire Code Appendix III-AA. Final fire flows will be based on the size of buildings, their relationship to other structures, property lines, and types of construction used.

Fire hydrant spacing shall be based on fire flow requirements as outlined in the 2002 County of Los Angeles Fire Code Appendix III-BB. Additional hydrants will be required if hydrant spacing exceeds specified distances.

Turning radii shall not be less than 32 feet. This measurement shall be determined at the centerline of the road. A Fire Department approved turning area shall be provided for all driveways exceeding 150 feet in length and at the end of all cul-de-sacs.

All on-site driveways/roadways shall provide a minimum unobstructed width of 28 feet, clear-to-sky. The on-site driveway is to be within 150 feet of all portions of the exterior walls of the first story of any building. The centerline of the access driveway shall be located parallel to, and within 30 feet of an exterior wall on one side of the proposed structure. Driveway width for Institutional developments shall be increased when any of the following conditions will exist:

1. Provide 34 feet in width when parallel parking is allowed on one side of the access roadway/driveway. Preference is that such parking is not adjacent to the structure.
2. Provide 42 feet in width when parallel parking is allowed on each side of the access roadway/driveway.
3. Any access way less than 34 feet in width shall be labeled "Fire Lane" on the final recording map, and final building plans.
4. For streets or driveways with parking restrictions: The entrance to the street/driveway and intermittent spacing distances of 150 feet shall be posted with Fire Department approved signs stating "NO PARKING – FIRE LANE" in three-inch high letters. Driveway labeling is necessary to ensure access for Fire Department use.

HIGH-DENSITY RESIDENTIAL:
The development may require fire flows up to 5,000 gallons per minute at 20 pounds per square inch residual pressure for up to a five-hour duration. Final fire flows will be based on the size of the buildings, their relationship to other structures, property lines, and types of construction used. Fire hydrant spacing shall be 300 feet and shall meet the following requirements:

1. No portion of lot frontage shall be more than 200 feet via vehicular access from a public fire hydrant.

2. No portion of a building shall exceed 400 feet via vehicular access from a properly spaced fire hydrant.
3. When cul-de-sac depth exceeds 200 feet, hydrants will be required at the corner and mid-block.
4. Additional hydrants will be required if the hydrant spacing exceeds specified distances.

Turning radii shall not be less than 32 feet. This measurement shall be determined at the centerline of the road. A Fire Department approved turning area shall be provided for all driveways exceeding 150 feet in length and at the end of all cul-de-sacs. When serving land zoned for residential uses having a density of more than four (4) units per net acre:

1. A cul-de-sac shall be a minimum of 34 feet in width and shall not be more than 700 feet in length.
2. The length of the cul-de-sac may be increased to 1,000 feet if a minimum of 36 feet in width is provided.
3. A Fire Department approved turning area shall be provided at the end of a cul-de-sac.

All on-site driveways shall provide a minimum unobstructed width of 28 feet, clear-to-sky. The 28 feet width does not allow for parking, and shall be designated as a "Fire Lane," and have appropriate signage. The centerline of the on-site driveway shall be located parallel to and within 30 feet of an exterior wall on one side of the proposed structure. The on-site driveway is to be within 150 feet of all portions of the exterior walls of the first story of any building. The 28 feet in width shall be increased to:

1. Provide 34 feet in width when parallel parking is allowed on one side of the access way.
2. Provide 36 feet in width when parallel parking is allowed on both sides of the access way.
3. Any access way less than 34 feet in width shall be labeled "Fire Lane" on the final recording map, and final building plans.
4. For streets or driveways with parking restrictions: The entrance to the street/driveway and intermittent spacing distances of 150 feet shall be posted with Fire Department approved signs stating "NO PARKING – FIRE LANE" in three-inch high letters. Driveway labeling is necessary to ensure access for Fire Department use.

SINGLE-FAMILY/TWO-FAMILY DWELLING UNITS:

Single-family detached homes shall require a minimum fire flow of 1,250 gallons per minute at 20 pounds per square inch residual pressure for a two-hour duration. Two-family dwelling units (duplexes) shall require a fire flow of 1,500 gallons per minute at 20 pounds per square inch residual pressure for a two-hour duration. When there are five (5) or more units taking access on a single driveway, the minimum fire flow shall be increased to 1,500 gallons per minute at 20 pounds per square inch residual pressure for a two-hour duration. Fire hydrant spacing shall be 600 feet and shall meet the following requirements:

1. No portion of lot frontage shall be more than 450 feet via vehicular access from a public fire hydrant.
2. No portion of a structure should be placed on a lot where it exceeds 750 feet via vehicular access from a properly spaced public fire hydrant.
3. When cul-de-sac depth exceeds 450 feet on a residential street, hydrants shall be required at the corner and mid-block.
4. Additional hydrants will be required if hydrant spacing exceeds specified distances.

A Fire Department approved turning area shall be provided for all driveways exceeding 150 feet in length and at the end of all cul-de-sacs. Fire Department access shall provide a minimum unobstructed width of 28 feet, clear-to-sky and be within 150 feet of all portions of the exterior walls of the first story of any single unit. If exceeding 150 feet, provide 20 feet minimum paved width "Private Driveway/Fire Lane" clear-to-sky to within 150 feet of all portions of the exterior walls of the unit. Fire Lanes serving three (3) or more units shall be increased to 26 feet. Streets or driveways within the development shall be provided with the following:

1. Provide 36 feet in width on all streets where parking is allowed on both sides.
2. Provide 34 feet in width on cul-de-sacs up to 700 feet in length. This allows parking on both sides of the street.
3. Provide 36 feet in width on cul-de-sacs from 701 to 1,000 feet in length. This allows parking on both sides of the street.
4. For streets or driveways with parking restrictions: The entrance to the street/driveway and intermittent spacing distances of 150 feet shall be posted with Fire Department approved signs stating "NO PARKING – FIRE LANE" in three-inch high letters. Driveway labeling is necessary to ensure access for Fire Department use.
5. Turning radii shall not be less than 32 feet. This measurement shall be determined at the centerline of the road.

LIMITED ACCESS DEVICES (GATES, ETC.):

All access devices and gates for schools shall comply with California Code of Regulations, Title 19, Article 3.05 and Article 3.16. All access devices and gates for residential developments shall meet the following requirements:

1. Any single-gated opening used for ingress and egress shall be a minimum of 26 feet in width, clear-to-sky.
2. Any divided gate opening (when each gate is used for a single-direction of travel – i.e., ingress or egress) shall be a minimum width of 20 feet clear-to-sky.
3. Gates and/or control devices shall be positioned a minimum of 50 feet from a public right-of-way, and shall be provided with a turnaround having a minimum of 32 feet of turning radius. If an intercom system is used, the 50 feet shall be measured from the right-of-way to the intercom control device.
4. All limited access devices shall be of a type approved by the Fire Department.
5. Gate plans shall be submitted to the Fire Department prior to installation. These plans shall show all locations, widths and details of the proposed gates.

TRAFFIC CALMING MEASURES:

All proposals for traffic calming measures (speed humps/bumps/cushions, traffic circles, roundabouts, etc.) shall be submitted to the Fire Department for review prior to implementation. Should any questions arise regarding design and construction, and/or water and access, please contact Inspector Marvin Dorsey at (323) 890-4243.

FORESTRY DIVISION:

The statutory responsibilities of the County of Los Angeles Fire Department, Forestry Division include erosion control, watershed management, rare and endangered species, vegetation, fuel modification for Very High Fire Hazard Severity Zones or Fire Zone 4, archeological and cultural resources, and the County Oak Tree Ordinance.

Oak trees are known to exist in the proposed project area. Further field studies should be conducted to determine the presence of this species on the project site.

Under the Los Angeles County Oak Tree Ordinance, a permit is required to cut, destroy, remove, relocate, inflict damage or encroach into the protected zone of any tree of the Oak genus which is 25 inches or more in circumference (eight (8) inches in diameter), as measured 4 1/2 feet above mean natural grade. The applicant should incorporate innovative design to reduce or eliminate the impact to the Oak resources.

This property is located within the area described by the Forester and Fire Warden as a Very High Fire Hazard Severity Zone or Fire Zone 4. The development of this project must comply with all Very High Fire Hazard Severity Zone code and ordinance requirements for fuel modification.

As required by Section 1117.2.1 of the County of Los Angeles Fire Code, a fuel modification plan, a landscape plan, and an irrigation plan shall be submitted with any subdivision of land or prior to any new construction, remodeling, modification or reconstruction where such activities increase the square footage of the existing structure by at least 50% within a 12-month period and where said structure or subdivision is located within an area designated as a Very High Fire Hazard Severity Zone or within Fire Zone 4.

A fuel modification plan, a landscape plan, and an irrigation plan shall be developed and approved prior to construction. Said plans shall be reviewed and approved by the County of Los Angeles Fire Department, Forestry Division. Specific questions regarding fuel modification requirements should be directed to the Fuel Modification Office at (626) 969-5205.

This project will require an EIR fee deposit of $1,000 payable to the County of Los Angeles Fire Department at the time the DEIR is submitted for review. (See enclosed)

If you have any additional questions, please contact this office at (323) 890-4330.

Very truly yours,

David R. Leininger

DAVID R. LEININGER, CHIEF, FORESTRY DIVISION
PREVENTION BUREAU

DRL:sc

Enclosure

bc: Yocum/ERU, Division III, EIR #2088/Pac., Chalton/Saugus, Land Development, Planning, #219
(EIR #2088.b70)

LOS ANGELES COUNTY FIRE DEPARTMENT
ENVIRONMENTAL REVIEW FEES & DEPOSITS

Effective September 11, 1991, whenever a review for impact on the fire prevention, natural resources, and/or fire resource allocation responsibilities of the Fire Department is required, as part of the environmental review process, the applicant shall pay a minimum deposit fee of $1,000 from which actual costs shall be billed and deducted. Additional deposits may have to be made if actual review costs exceed 80% of deposited funds. A larger deposit may be made for more complex projects to ensure prompt continuation of environmental review efforts. All unused funds shall be refunded to the applicant.

All Environmental Review Deposits should be made payable and sent to:

County of Los Angeles Fire Department
P.O. Box 910901
Commerce, CA 90091-0901
Attn: Financial Management Division

If you have any questions regarding the Environmental Review Fee or Deposit amount, please call the Forestry Division at (323) 890-4330.

If you have any questions regarding your Environmental Review Deposit status, please contact the Fiscal Services Division at (323) 838-2345.

California Regional Water Quality Control Board

Los Angeles Region

Over 51 Years Serving Coastal Los Angeles and Ventura Counties

Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

Terry Tamminen
Secretary for Environmental Protection

Arnold Schwarzenegger
Governor

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: http://www.swrcb.ca.gov/rwqcb4

RECEIVED JAN 3 2005

December 30, 2004

Hsiao-ching Chen
Los Angeles County Department of Regional Planning
320 W Temple St
Los Angeles, CA 90012

Dear Hsiao-ching Chen,

Re: CEQA Documentation for Project in the Santa Clara Watershed

Skyline Ranch Project, Project No. 03-075, Tract Map No. 060922
SCH #2004101090

We appreciate the opportunity to comment on the CEQA documentation for the above-mentioned project. For your information a list of permitting requirements and Regional Board Contacts is provided in Attachment A hereto.

The project site lies in the Santa Clara watershed that was listed as being impaired pursuant to Section 303 (d) of the Clean Water Act. Impairments listed in reaches downstream from the proposed project include nutrients and their effects, salts, coliform bacteria, and historic pesticides. The Los Angeles Regional Water Quality Control Board will be developing Total Maximum Daily Loads (TMDLs) for the watershed, but the proposed project is expected to proceed before applicable TMDLs are adopted. In the interim, the Regional Board must carefully evaluate the potential impacts of new projects that may discharge to impaired waterbodies.

Our review of your documentation shows that it does not include information on how this project will change the loading of these pollutants into the watershed. Please provide the following additional information for both the construction and operational phases of the project.

- For each constituent listed above, please provide an estimate of the concentration (ppb) and load (lbs/day) from non-point and point source discharges.
- Estimates of the amount of additional runoff generated by the project during wet and dry seasons.
- Estimate of the amount of increased or decreased percolation due to the project.

- Estimates of the net change in cubic feet per second of groundwater and surface water contributions under historic drought conditions (as compiled by local water purveyors, the Department of Water Resources, and others), and 10-year 50-year, and 100-year flood conditions.

The Upper Santa Clara River River has been subjected to significant urban development during the past 10 years. Unfortunately very little water quality data has been collected in this area, especially in comparison with data collected in the Lower Santa Clara River.

Additional water quality data are necessary to evaluate the cumulative impacts of past development and predict potential impacts of the subject project. Pollutants of concern include sediment, dissolved oxygen, pesticides, metals, and bioassessment.

If you have any questions please call me at (213) 576-6683.

Sincerely,

Elizabeth Erickson
Associate Geologist, TMDL Unit
Los Angeles Regional Water Quality Control Board

EE
Attachments (1)
cc:
State Clearinghouse
File

ATTACHMENT A

✓ If the proposed project will result in a **discharge of dredge or fill into a surface water** (including a dry streambed), and is subject to a **federal license or permit**, the project may require a *Section 401 Water Quality Certification*, or waiver of Waste Discharge Requirements. For further information, please contact:

Valerie Carillo, Nonpoint Source Unit at (213) 576-6759.

✓ If the project involves **inland disposal of nonhazardous contaminated soils and materials**, the proposed project may be subject to *Waste Discharge Requirements*. For further information, please contact:

Rodney Nelson, Landfills Unit, at (213) 620-6119

****

✓ If the overall project area is **larger than five acres**, the proposed project may be subject to the State *Board's General Construction Activity Storm Water Permit*. For further information, please contact:

Tracy Woods, Statewide General Construction Activity Storm Water Permits at (213) 620-2095.

✓ If the project involves a facility that is proposing to discharge storm water associated with **industrial activity** (e.g., manufacturing, recycling and transportation facilities, etc.), the facility may be subject to the State Board's *General Industrial Activities Storm Water Permit*. For further information, please contact:

Kristie Chung, Statewide General Industrial Storm Water Permits at (213) 620-2283.

✓ If the proposed project involves requirements for new development and construction pertaining to **municipal storm water programs**, please contact:

Dan Radulescu, Municipal Storm Water Permits, Los Angeles County at (213) 620-2038;
Jeff Mack, Municipal Storm Water Permits, Ventura County at (213) 620-2121.

✓ The proposed project also shall comply with the local regulations associated with the applicable **Regional Board stormwater permit:**

<u>Los Angeles County and Co-permittees:</u>
NPDES No. CAS614001
Waste Discharge Requirements Order No. 96-054.

<u>Long Beach County and Co-permittees:</u>
NPDES CAS004003
Waste Discharge Requirements Order No. 99-060.

<u>Ventura County and Co-permittees</u>:
NPDES No. CAS004002
Waste Discharge Requirements Order No. 00-108.

****

✓ If the proposed project involves any construction and/or groundwater **dewatering to be discharged to surface waters,** the project may be subject to *NPDES/Waste Discharge Requirements*. For further information, please contact:

Augustine Anijielo, General Permitting and Special Projects Unit at (213) 576-6657(All Region 4 Watersheds).

✓ If the proposed project involves any construction and/or groundwater **dewatering to be discharged to land or groundwater**, the project may be subject to *Waste Discharge Requirements*. For further information, please contact:

Kwang-il Lee, Non-Chapter 15 Unit, at (213) 620-2269 (All Region 4 Watersheds).

County of Los Angeles Public Library
7400 East Imperial Hwy., P.O. Box 7011, Downey, CA 90241-7011
(562) 940-8461, TELEFAX (562) 803-3032

Library

MARGARET DONNELLAN TODD
COUNTY LIBRARIAN

February 25, 2005

RECEIVED
MAR 1 2005

TO: Hsiao-ching Chen
Los Angeles County Department of Regional Planning

FROM: Malou Rubio
Head, Staff Services

SUBJECT: **SKYLINE RANCH PROJECT**
PROJECT No. 04-075, TENTATIVE TRACT MAP No. 060922

This is in response to your request for information regarding the Draft Environmental Impact Report for the Skyline Ranch project. The Skyline Ranch project is located in the County Library's Developer Fee Planning Area 1 and is within the Canyon Country Jo Anne Darcy Library (Canyon Country Library) service area. The Canyon Country Library is located at 18601 Soledad Canyon Road. It is a 12,864 sq. ft. facility and has a current collection of 109,796 books and other materials.

Demand for library services is typically determined based on the size of the resident population. Increase in population results in a need for additional facility space and library items. The Library Capacity section of the Urban Services Analysis uses 2 volumes (items) per capita and 0.389 sq. ft. of facility space per capita. The current Public Library service level guidelines are 2.0 items per capita for new libraries (opening day collection), 2.75 items per capita for community libraries (built-out collection), and 0.5 sq. ft. of facility space per capita.

Using an average persons per household of 3.09, the proposed Skyline Ranch project would result in an estimated population increase of 4,150 (1,343 x 3.09). This projected population increase would generate a need for an additional 2,075 sq. ft. (4,150 x 0.5) of facility space and 11,413 books and other materials (4,150 x 2.75). Please revise the numbers in the EIR to reflect current service level guidelines.

The cumulative effect of new housing and infill development, such as the Skyline Ranch project, will have significant impact on the ability of the Canyon Country Library to serve existing and future population in the service area. This impact may be mitigated by payment of the County Library's developer fee. If the project is approved and built as described, it will result in a total of 1,343 dwelling units. The current County Library Developer Fee for Planning Area 1 is $677 per dwelling unit. This would result in a total fee obligation of $909,211 (1,343 x $677) at the current rate. The County Library Developer Fee is subject to an annual CPI adjustment, and the actual amount of the fee will be that in effect at the time the building permits for the project are issued. Therefore, the total fee obligation for this project may be higher.

If you have any questions or require additional information, please contact Malaisha Hughes at (562) 940-8455.

MR:MH:mh
U:\STAFFSERVICES\DEVELOPER FEE\EIR\Skyline Ranch-2.doc

c: David Flint, Assistant Director, Finance and Planning, Public Library

Appendix B: Geotechnical Reports

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 60922
SUBDIVIDER Pardee Homes
ENGINEER Sikand
GEOLOGIST & SOILS ENGINEER Geolabs – Westlake Village

TENTATIVE MAP DATED 12/27/04 (Revised)
LOCATION Santa Clarita
REPORT DATE 1/3/05, 8/23/04, 3/6/04

[X] **TENTATIVE MAP FEASIBILITY IS RECOMMENDED FOR APPROVAL. PRIOR TO FILING THE FINAL LAND DIVISION MAP, THE FOLLOWING CONDITIONS MUST BE FULFILLED:**

[X] The final map must be approved by the Geology and Soils Sections to assure that all geotechnical (geology and soils) factors have been properly evaluated.

[X] A grading plan must be geotechnically approved by the Geology and Soils Sections. This grading plan must be based on a detailed engineering geology report and/or soils engineering report and show all recommendations submitted by them. It must also agree with the tentative map and conditions as approved by the Planning Commission. If the subdivision is to be recorded prior to the completion and acceptance of grading, corrective geologic bonds will be required.

[X] All geologic hazards associated with this proposed development must be eliminated,

or

delineate restricted use areas, approved by the consultant geologist and/or soils engineer, to the satisfaction of the Geology and Soils Sections, and dedicate to the County the right to prohibit the erection of buildings or other structures within the restricted use areas.

[ ] A statement entitled: "Geotechnical Note(s), Potential Building Site: For grading and corrective work requirements for access and building areas for Lot(s) No(s). _____ refer to the Soils Report(s) by _____ ,dated _____."

[X] The Soils Engineering review dated 2/22/05 is attached.

[X] **TENTATIVE MAP IS APPROVED FOR FEASIBILITY. THE FOLLOWING INFORMATION IS APPLICABLE TO THIS DIVISION OF LAND:**

[ ] This project may not qualify for a waiver of final map under section 21.48.140 of the Los Angeles County Title 21 Subdivision Code.

[ ] The subdivider is advised that approval of this division of land is contingent upon the installation and use of a sewer system.

[ ] A geology and/or soils engineering report may be required prior to approval of building or grading plans.

[X] Geotechnical Recordation Map verification deposit estimate 6 hours.

[ ] Groundwater is less than 10 feet from the ground surface on lots _____

Prepared by _____ Geir R. Mathisen Reviewed by _____ Charles T. Nestle Date 2/7/05

P:\Gmepub\Geology Review\Forms\Form02.doc
1/7/03

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 8.2
Job Number LX001129 & GMTR
Sheet 1 of 2

Review No. 2

DISTRIBUTION:
___ Drainage
___ Grading
___ Geo/Soils Central File
___ District Engineer
___ Geologist
___ Soils Engineer
___ Engineer/Architect

Tentative Tract Map	60922
Location	Santa Clarita
Developer/Owner	Pardee Homes
Engineer/Architect	Sikand
Soils Engineer	Geolabs - Westlake Village
Geologist	Same as above

Review of:

Revised Tentative Tract Map Dated By Regional Planning 12/27/04
Soil Engineering and Geologic Report Dated 1/3/05, 8/23/04, 3/06/04

Previous review sheet dated 1/19/05

ACTION:

Tentative Map feasibility is recommended for approval.

REMARKS:

1. Provide a soils engineering report at the grading plan stage. The report must comply with the provisions of **"Manual for Preparation of Geotechnical Reports"** prepared by County of Los Angeles, Department of Public Works. The Manual is available on the Internet at the following address: ***http://ladpw.org/construction/manual.pdf***

2. Submit two sets of grading plans to the Soils Section for verification of compliance with County codes and policies.

NOTE(S) TO THE PLAN CHECKER/BUILDING AND SAFETY ENGINEER:
A. THE ON-SITE SOILS ARE SEVERELY CORROSIVE TO FERROUS METALS.
B. THE ON-SITE SOILS HAVE A MEDIUM EXPANSION POTENTIAL.
C. OFF-SITE GRADING IS RECOMMENED FOR THE REMOVAL AND RECOMPACTION OF LANDSLIDES QLS-9A, QLS-10, QLS-10A, L1, AND L17.

REGISTERED PROFESSIONAL ENGINEER
YOSHIYA MORISAKU
No. 57567
Exp. 6/30/05
CIVIL
STATE OF CALIFORNIA

Reviewed by Yoshiya Morisaku Date 2/23/05
Yoshiya Morisaku

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\60922TentTd

Geotechnical Investigation of Vesting Tentative Tract No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

W.O. 8838

March 6, 2004

Geolabs-Westlake Village

GEOLABS-WESTLAKE VILLAGE
Foundation and Soils Engineering, Geology
31119 Via Colinas, Suite 502 • Westlake Village, CA 91362
Voice: (818) 889-2562 (805) 495-2197
Fax: (818) 889-2995 (805) 379-2603
a dba of
R & R Services
Corporation

March 6, 2004
W.O. 8838

Pardee Homes
1320 Flynn Road, Suite 100
Camarillo, California

Attention: Mr. Wade Lewis

SUBJECT: Geotechnical Investigation of Vesting Tentative Tract No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

Gentlemen;

We present herein our findings from our geotechnical investigation of Vesting Tentative Tract No. 060922, Skyline Ranch in the Whites Canyon area of the Santa Clarita Valley. The purpose of our investigation was to identify the major geologic and geotechnical elements of the site which might impact the proposed development.

The scope of work included the following: review of aerial photographs and published geological maps covering the site, review of consultant's reports for adjacent properties which were readily available to our office, geologic mapping of the site, the recent drilling and sampling of twenty-two large-diameter bucket-auger borings, advancement of five continuously-cored borings within areas of deep cut and conglomerate-rich bedrock formations, excavation and logging of sixteen exploratory test pits, laboratory testing of selected samples, soils engineering analyses, and preparation of this report. In addition, subsurface data from our previous geotechnical investigations of the Monarch Hills property (Geolabs-Westlake Village, 1997) and our due diligence study of the Skyline Ranch property (GWV, 2002) are included herein.

SITE LOCATION

The subject property is located in northern Santa Clarita Valley, west of Sierra Highway and southeast of the Plum Canyon residential development. The site is best accessed from its westerly boundary, via basins at the terminus of Canyon Crest Drive or Falcon Crest Court within the Tr. 46626 (recently constructed by Richmond American Homes). Both points of entry provide access to a dirt access road which climbs a north-trending ridgeline. This access road eventually heads in a northeasterly direction and climbs along the east-west trending ridgeline which separates the Plum Canyon drainage to the north with that of Whites Canyon (and the proposed development footprint) to the south.

The current City of Santa Clarita boundary traverses the westerly and southerly boundary of the site. Tract No. 46626 (directly to the west) was recently developed by Richmond American Homes). The Plum Canyon Development of S&S Construction is located to the northwest.

Evidence of prior use of the site is minimal. Small residential structures were present in the southwest corner of the site (in the Sherburne parcel) but have since been demolished. We surmise that these structures were serviced by on-site sewage disposal systems comprised of either leach fields or seepage pits. No evidence of either feature was observed in our site visit to this locality. Review of the references available to our office do not indicate the presence of any oil wells on the site. However, two drilling pads were observed in the vicinity of Cross Section G-G'. We believe this to be the locations of either geotechnical, water, or oil well exploratory borings.

SITE TOPOGRAPHY

The enclosed Geologic Map was prepared at a scale of 1"=200' utilizing the Tentative Tract Map and topography prepared by Sikand Engineering (see Plate 1.2). A Geologic Map without the proposed development enclosed as Plate 1.4 for easier review of the topography, geologic conditions,

and exploratory findings.

The subject property is dominated by a broad east-west trending ridge located between Plum Canyon to the north and Whites Canon to the south. The northerly tract line traverses the numerous rounded peaks and saddles of this ridgeline. The northerly flank of this ridge is moderately to steeply incised, with slopes averaging 250 feet in height from the ridgetop to Plum Canyon below.

The southerly flank of the ridge is notably more subdued, with numerous southerly to southwesterly draining canyons, typically paralleling the rounded ridgespurs. The higher portions of these ridgespurs which exhibit the subdued, rounded topographic expression appear to represent an older erosional surface. Examples of similar ancient land forms are have been noted in the immediate vicinity and include Mystery (Cruzan) Mesa to the northeast. These ancient land form surfaces may correlate to broad, elevated erosional surfaces along the west-side of Bouquet Canyon (located west of Mystery Mesa) and the subject property.

The lower portions of the site, such as the canyon bottoms along the Whites Canyon drainage exhibit steeper, more rugged terrain indicative of recent and active erosional processes (stream rejuvenation). Total relief from the major ridgeline to the lower reaches of Whites Canyon is on the order of 650 feet.

Geologic influences on topography are evident in some portions of the site in the form of strike ridges (ridgelines conforming to the strike of hard, resistant beds), topographic reversals associated with landsliding, and geologic contacts.

PROPOSED GRADING

The 1"=200' scale Tentative Tract Map prepared by Sikand Engineering proposed the development of the site for 1340± single family residences, associated streets, three park sites, and two water reservoir pads (at elevations 2,215 and 1,927 feet). The proposed Whites Canyon

Highway will provide access to the site, in addition to connecting Sierra Highway to Plum Canyon Road. Whites Canyon Highway will consist of four lanes with a center greenbelt/meridian, and enhanced intersections.

Fill slopes are proposed around the westerly and southerly portions of the site, while the major perimeter cut slopes would be constructed along the easterly and northerly ridgelines. The upper reaches of Whites Canyon shall be filled, enhancing the site stability.

Fill slopes are planned at gradients of 2:1 or flatter, to a maximum height of 200 feet (See Cross Section S-S'). The maximum depth of fill is anticipated to be on the order of 140 feet following alluvial removals within Whites Canyon.

Cut slopes are also planned at a gradient of 2:1 or flatter to maximum height of 210 feet (see Cross Section P-P'). The maximum depth of planned cut approaches 200 feet as illustrated in Cross Section P-P'.

PREVIOUS EXPLORATION AND STUDIES

Previous exploration was performed by our office in 1995 in the southeasterly portion of the site. A total of twelve bucket-auger borings (see Plates B1(1995) through B12(1995) were drilled, along with the excavation and logging of twenty-three test pits (see Plates T1-T23).

The adjacent Tr. 46626 was investigated by Pacific Soils Eng. and Geosoils. Pertinent data (boring B-115 and in-grading attitudes) from their reports are included on the Geologic Map. Data from the Plum Canyon development in the northwesterly portion of the site is somewhat sparse since that development is primarily north and west of Plum Canyon Road.

EARTH MATERIALS

Through the course of our investigation, the following earth materials have been mapped at the subject site:

Engineered Fill

Engineered fill placed for Tr. 46626 and under the observation of Geosoils, Inc. is located west of Skyline Ranch. Engineered fill placed for a buttress fill/landslide removal may extend on-site within northerly trending ridgeline which separates the Skyline Ranch from Tr. 46626.

Artificial Fill

Localized undocumented fills were observed in association with existing dozer roads, and abandoned house site in the southwest corner of the site. Field observations indicate that these soils are typically less than five feet in thickness. Similarly, minor dozer road fill and pads constructed by our office for this investigation are similarly thin. Such materials will require removal in conjunction with the grading of the site.

Alluvial Deposits

These soils have been mapped within the major of canyon bottoms which traverse the site. In general, these materials consist of interbedded sand, gravel, cobbles, and boulders with only sparse to minor silt and clay content. A notable concentration of oversize boulders were noted within the vast majority of canyons (ranging from 12" to 6 feet in diameter). These boulders are typically subangular to subrounded, crystalline, and very hard (granitic or gneissic composition).

Based on field observations and exploratory test pits, we anticipate these soils to be unconsolidated and thus require removal and recompaction within areas to receive engineered fill. We anticipate the oversize rock to create some difficult excavation conditions.

The depth of these materials within the smaller southerly-draining canyon was found to be relatively thin (less than 10 feet). Bedrock outcroppings were observed along many of the canyon bottoms. However, we anticipate canyon cleanouts to be relatively steep and narrow ("V-shaped") with buried canyon walls continuing at gradients similar to (2:1 to 1:1) the exposed canyon slopes.

Exploration within canyon bottoms was somewhat difficult in light of the abundance of large boulders.

Within Whites Canyon, the alluvial deposits are very coarse-grained, consisting of gravels, cobbles, and boulders within a poorly sorted sand matrix. Deposits may also be clast-supported (i.e. boulders and cobbles in contact with one another). Due to environmental concerns and difficult access conditions, exploration with Whites Canyon was not feasible at the time of our site investigation. Access to the canyon bottom would have required extensive dozer work which was determined inappropriate at this time by the project environmental consultant. The depth of these alluvial soils is anticipated approach or exceed 40 feet.

Colluvial/Slopewash Deposits

Colluvial and slopewash deposits have been observed within the smaller tributary canyons. Due to the localized nature of these materials, we have not mapped them at the scale of 1"=200'. These soils are generally located in the subdued topography and are generated from the weathering of the underlying formations as well as from down-slope creep processes. Findings from our exploratory test pits indicate that these materials are typically less than 5 feet in thickness and consist of gravelly to cobble-rich silty and clayey sands in a dry and slightly loose to slightly dense condition. These materials are not considered suitable to remain in areas to receive fills and are recommended for removal during the grading of the site.

Landslide Debris

Numerous landslides have been identified on the site on the basis of field observations, aerial photo review, and topographic expression. These materials will require complete removal due to their potential compressibility, hydroconsolidation, and/or to provide satisfactory slope stability conditions.

The largest landslides observed appear to have failed in the direction of the prevailing dip of the Saugus Formation. Such landslides were likely triggered by the undermining of westerly-facing natural slopes within canyons.

Additional discussion with respect to landsliding and slope stability is provided later in this report.

Terrace Deposits

Terrace deposits have been mapped adjacent to Whites Canyon, locally capping the relatively flatter portions of the higher terrain. Based on the test pits excavated on the Monarch Hills property, these remnant deposits generally consist of reddish brown clayey sand to silty sand with occasional lenses of gravels and cobbles. Their depths typically range from ten to fifteen feet. The vast majority of these materials shall be removed by the planned cut.

Saugus Formation

The majority of the site is underlain by the Quaternary-age Saugus Formation, which is comprised of poorly lithified, nonmarine sandstone and conglomerate. The lowermost 20 to 50 feet of this formation typically consists of a massively-bedded cobble to boulder conglomerate which is exposed along White Canyon and in its tributary canyons. Some regional geologic maps have differentiated this lithologic section from the overlying section which contains less conglomerate.

Lesser sandy siltstone and red sandy claystone (possibly paleosols) have been observed in outcrop and borings in the westerly portion of the site which corresponds to the upper (younger) portion of the formation. These units appear poorly to massively bedded and in a dense condition. The red clayey beds encountered in this formation typically require removal and recompaction where exposed at grade due to their expansion potential. These beds also strongly influence the site stability on account of their lower shear strength.

Mint Canyon Formation

The Miocene-age Mint Canyon Formation exposed on the project site is primarily comprised of nonmarine sandstone and conglomerate with poor to moderate cementation. The conglomerate units are typically massively bedded but occasionally well-defined bedding can be observed within the finer-grained sandstone sections.

The upper portion of this formation consists of a white, light grey, or greenish grey conglomerate which is commonly discernible from the overlying light orangish brown to tan Saugus Formation basal conglomerate. In addition, the conglomerates and sandstones of the Mint Canyon Formation typically exhibit better sorting and less silt and clay content that those of the Saugus Formation. Fine grained siltstone and claystone within the Mint Canyon Formation are relatively rare on the subject tract. Unoxidized materials were not encountered in our deep borings.

GEOLOGIC STRUCTURE

Regional geologic maps of the Mint Canyon Quadrangle (Dibblee, 1996 and Yerkes, 1996) indicate that bedding of both the Saugus and Mint Canyon formations dip gently to the west and southwest. Data obtained during the course of our investigation agree with this generalization of the geologic structure.

The Saugus Fm.-Mint Canyon Fm. contact observed within numerous canyon bottoms and sides indicates an overall shallow westerly to southwesterly dip for the formational contact. Internal bedding of the Saugus Formation yields dip directions ranging from due south to due west, with dip angles typically between 0 (horizontal bedding) to 10 degrees. Variations in dip direction and inclination are attributed to localized structural variations, cross-bedding, and channelization within the formation. The basal portion of the Saugus Formation is typically comprised of a massively-bedded cobble to boulder conglomerate, particularly in the easterly portion of the site. Overall, the

Saugus Formation exhibits a slight fining of lithologies moving east to west across the site, which corresponds with increasing exposure of higher stratigraphic horizons of the formation.

The Mint Canyon Formation, in general, yields slightly steeper dips on average (typically between 10 and 25 degrees), with prevailing westerly dip directions.

A broad westerly-plunging syncline has been mapped across the site by Dibblee (1996). Data obtained by our investigation confirms the westerly-dipping structure but does not conform well to this feature interpreted by Dibblee (1996).

LANDSLIDING AND SLOPE STABILITY

As part of our investigation, numerous regional maps were reviewed for the determination of previously mapped landslides. One of these maps, presented in the Seismic Evaluation Report of the Mint Canyon 7.5-Minute Quadrangle (CDMG, 1998) indicated the presence of large-scale landsliding within the westerly half of the subject property. This map is reproduced herein as Plate 1.4. Such large-scale landsliding has been documented in the immediate vicinity of Santa Clarita (Plum Canyon and Shangri-La landslide complexes). Review of 1 inch = 2000 feet scale topographic maps and aerial photographs render some topographic expressions and geomorphic features suggestive of such a large-scale landslide(s). In addition, the direction of landsliding (to southwest) conforms with much of the prevailing dip direction of the Saugus Formation. A primary objective of our drilling B1 through B8 in 2002 was to determine the presence or absence of such large-scale landslides which might complicate the development of the site.

Aerial Photo Review

Aerial photographs were obtained and reviewed in order to discern the extent of landsliding on the site. Numerous small to moderate size landslides were identified on the aerial photographs and similarly supported by field observations and their geomorphic expression in the 1"=200' scale

topographic map. The majority of these landslides appear to have failed in the direction of the prevailing dip of the Saugus Formation. Such landslides were likely triggered by the undermining of westerly-facing natural slopes within canyons which led to daylighted bedding conditions. Due to the generally shallow dips, some of the landslides may have failed in a rotational fashion, as large-scale slumps. The scarps of the larger landslides are commonly healed and appear to have been infilled with slopewash, but topographic breaks or benches at the heads of the landslides remain discernible.

The 1"=2000' scale topography of the westerly and southwesterly portion of the site displays numerous saddles, locally irregular drainages alignments, and large-scale hummocky-like topography. Explanation of such features are commonly attributed to large-scale landsliding or alternatively, a combination of small-scale landslides and geomorphic expression of the underlying geologic structure.

Review of Regional Maps and Geologic Mapping

Regional Geologic Maps with coverage of the site were reviewed as part of our landslide investigation. Only the Seismic Evaluation Report of the Mint Canyon 7.5-Minute Quadrangle (CDMG, 1998) contains the postulated large-scale landslide. Maps prepared by Dibblee (1996), and Yerkes (1996), and Larson (1990) do not display such large-scale landsliding. Rather, they indicate smaller landslides.

These later three referenced geologic maps present the geologic contact between the Saugus Formation and underlying Mint Canyon Formation along numerous canyon walls of the site. This contact was similarly observed and mapped by our office during the course of our fieldwork. No indication of displacement by a large-scale landslide (of the contact or internally bedding of each formation) was observed.

Subsurface Borings

Six large diameter bucket-auger borings were drilled in 2002 in order to further our understanding of the site conditions. Minor dozer work was performed to improve existing dirt roads and to create level drilling pads. Borings were located within areas of suspicious topography in relation to the early hypothesis of large-scale landsliding. In addition, care was exercised to locate borings along canyon sides or bottoms to minimize the depth of drilling to penetrate any deep-seated slideplane. These borings were downhole-logged by our geologist (or by BIPS camera logging) for observation of the stratigraphy and geologic structure.

As described in the attached boring logs, drilling conditions were very difficult on account of the abundance of conglomerate beds requiring coring. In particular, conglomerate beds of the Mint Canyon Formation were difficult to penetrate on account of the large crystalline boulders and cobbles, and the localized cementation of the matrix in the conglomerates. Refusal was encountered in all of the bucket-auger borings prior to the intended depth of exploration. In the case of Boring 3, over 30 hours of coring was performed to advance the hole from 40 to 70 feet in depth.

Boring data from Borings 2 and 3 provided additional control on the Saugus-Mint Canyon Fm. contact, supporting the southwesterly dip indicated from field mapping and regional geologic maps. Furthermore, these borings were located in an area of suspected large-scale landsliding. No evidence of landsliding was observed in the borings; bedrock units were observed to be notably hard, very dense, and undisturbed. No fine-grained lithologies (siltstone or claystone) were observed.

Evidence of landsliding such as disaggregated bedrock, extensive weathering or fracturing, or slideplanes, were not observed within any of these bucket-auger borings.

Continuous-Core Borings and BIPS Logging

Due to the difficulty encountered in the advancement of the bucket-auger borings and the limited depth capability of the downhole-logging, a second episode of exploration was performed in 2002 with a Boyles-37 four-wheel drive HQ-HX coring rig. Upon completion of these borings (Borings 7 and 8), the BIPS system (Borehole Image Processing System) was utilized to log the interior of the boring for the recordation of geologic data such as strike and dip of bedding, joints, and shears, and lithology. This data complements the rock cores recovered, and provides a means of structural data acquisition as well as documenting zones where core recovery is poor.

Raw data in the form of a VHS format videotape of the boring was processed by Layne-Christiensen Drilling Company for determination of the structural data. As indicated in the enclosed boring logs and JPG files for B7 and B8 (See CD1), the materials encountered were entirely coarse-grained (sandstone and conglomerate). Structural data interpreted by Layne Christiansen is provided after each boring log. Strike orientation was corrected by our office from magnetic north to true north (14 degree declination correction). The features from which these attitudes were obtained were then reviewed to determine if they consisted of bedding planes, fractures, shears, or faults. Numerous attitudes were based on the tops or bottoms of cobbles or boulders and thus not considered representative of bedding. Ultimately, the data plotted and added to the boring logs (Plates B7 & B8) include that structural data which was considered most representative of bedding and fracture planes observed in the log images. This process was also performed for the more recently drilled B17, B18, and B20 which were logged by a downhole camera.

These deep borings provided the following critical pieces of data: (1) the lack of deep-seated landsliding via direct observation of the lack of landslide planes, (2) the lack of any landslide-related

disturbance such as open fractures or disaggregated bedrock, and (3) confirmation of the lack of fine-grained beds within the southerly portion of the site which might impact the stability of the site with respect to the Whites Canyon drainage, and (4) additional control on the Saugus Fm./Mint Canyon Fm. geologic contact.

Mitigation of Small and Moderate-Level Landslides

A total of 25 landslides have been identified within VITM 060922 and four additional landslides have been mapped by Leighton (1999) in the vicinity of Whites Canyon Highway connection to Plum Canyon (Leighton Qls-9, Qls-9a, Qls-10, and Qls-10a). A brief description and discussion for these features are provided herein, along with their proposed mitigation measures (as warranted).

Landslide L1

Landslide L1 consists of a rotational failure within the Saugus Formation. A basin was constructed down-canyon as part of its mitigation with respect to Tr. 46626. Since the proposed Whites Canyon Hwy. alignment traverses this feature, it will require removal and recompaction in its entirety. The sloping portion above Whites Canyon Hwy (and outside of the planned graded slope) should be rebuilt at 2:1 or flatter.

Landslide L2

This landslide has a relatively well defined headscarp and bench at its head, while its lower surface has experienced variable incision. Boring 26 encountered a reddish brown clay at 31 feet in depth which has been interpreted as the basal landslide plane. This landslide failed in a southeasterly direction, opposite to the direction of the prevailing structure. However, southeasterly dips were recorded at depth within B26, indicating that the mode of failure was translational. Most

of this landslide shall be removed by the planned cut. Remaining portions should be removed to competent bedrock.

Landslides L3, L4, L5, L6

These small landslides exhibit numerous features suggestive of recent failure such as tension cracks, poorly vegetated scarps, and obstructed drainages along their toes. These landslides should be removed and recompacted in their entirety during the grading of the site.

Landslides L7 and L8

These landslides failed in a northwesterly-direction into a steeply-incised canyon. Boring 27 encountered a landslide plane at 21.5 feet, with a southwesterly dip, indicating that their failure was in part translational. The majority of these landslides are to be removed by the planned cut; remaining portions should be removed and recompacted to competent bedrock.

Landslide L9

This landslide is located at the far northerly portion of the site (outside of the development footprint) and fails to the northwest across the tract boundary. Review of aerial photographs and the topography exhibit a broad, flat head area and steeply-incised canyon along its toe. The portion of L9 within the subject tract shall require placement in a Restricted Use Area.

Landslide L10, L11, L12, L13, and L14

These landslides have been mapped on the basis of mild topographic and field expression, and our review of available aerial photography. The prevailing westerly dip of the Saugus Formation further supports their presence. The planned grading calls for the vast majority of these features to be removed by the planned cut. Remaining portions should be removed to competent bedrock and replaced with engineered fill. Further exploration at the 1"=40' scale grading plan stage of these features is warranted to conclusively determine their presence.

Landslides L15, L16, and L20

These small landslides fail into canyons along their toes. They should be removed and recompacted to competent bedrock during the grading of the site.

Landslides L17 and L23

These features consist of relatively thin failures within the southeasterly canyon wall of Whites Canyon. They should be removed and recompacted to competent bedrock during the grading of the site. The planned development calls for deep engineered fill at their locations.

Landslides L18 and L19

Landslides L18 and L19 consist of thin deposits of slopewash which have accumulated on the flank of the steep westerly canyon wall of Whites Canyon. They have been mapped as landslides on account of their current surficial instability. These features shall be mitigated through removal and recompaction to competent bedrock.

Landslides L21 and L22

These two queried landslides are located outside of the limits of proposed development. Field observations of the morphology of this north-facing slope is obscured by dense vegetation. However, aerial photographs and the topography is suggestive of thin slumping, likely within the outer slopewash and weathered bedrock materials within the oversteepened natural slope. Slope stability analyses along R-R' assume the absence (i.e. failure) of L22 to establish a preliminary slope setback of 50 feet. Landslides L22 and the portion of L21 within the tract boundary should be placed in Restricted Use Areas.

Landslide L24 and L25

Portions of these small landslides that are not removed by the planned cut should be removed and recompacted to bedrock.

Offsite Landslides at Whites Canyon Highway and Plum Canyon Road

Four landslides have been identified by Leighton (1999) near the proposed connection of Whites Canyon Highway to Plum Canyon Road. Of these four, we anticipate Qls-10a to require complete removal and recompaction. Landslide Qls-10 will likely require partial removal and recompaction. Landslides Qls-9 and Qls-9a do not impact the road alignment on account of their distant location.

GROUNDWATER

Groundwater seepage within the hillside terrain was notably absent within the numerous bucket-auger borings. One exception was Boring 4, located within a small canyon tributary in the southerly portion of the site. This groundwater occurrence consisted of slow but steady seepage from sandstone and conglomeratic bedrock, at elevation 1655' (below the elevation of the canyon axis).

Within the deeper cored borings, groundwater was artificially elevated at the conclusion of drilling on account of the use of drilling mud. Hence, determination of the naturally occurring groundwater required selected borings to remain open until static groundwater conditions were established.

Groundwater was recorded at a depth of 169.5 feet in Boring 7 (approx. elev. 1790'), roughly 10.5 feet above the boring bottom.

Within Boring 8, groundwater remained at a depth of 120 feet (approx. elev.1434') roughly 3 weeks after its drilling. This elevation corresponds to the elevation of Whites Canyon stream bed to the south.

Within B17 and B18, the water levels dropped to the bottom of the cored boring within the weeks following their drilling. B22 experienced a similar rapid drop following after its completion. Hence, we do not consider groundwater present to the depths of exploration at those locations.

In summary, groundwater within the hillside terrain is at such depth that it is not anticipated to impact the proposed development.

Canyon Areas

Exploration within the floor of Whites Canyon and other major canyons on the site was impeded by environmental and property line constraints. We anticipate groundwater to be present in an unconfined condition within the deeper alluvial deposits of Whites Canyon. Further explanation in these areas is warranted at the 1"=40' scale grading plan stage or as soon as environmental issues allow the necessary dozer work in these areas.

LIQUEFACTION AND RELATED SEISMIC HAZARDS

Portions of Whites Canyon and a tributary canyon which extends on-site have been delineated as Seismic Hazard Zones where liquefaction hazards may exist according to the Official Map of Seismic Hazards for the Mint Canyon Quadrangle. These canyons contain very coarse-grained alluvial deposits in a generally matrix-supported condition. We anticipate groundwater to be present at depth, near the alluvial-bedrock contact. Mitigation of the liquefaction hazards for such materials is most commonly addressed by the removal and recompaction of the alluvial materials. We anticipate this to be necessary where the proposed development traverses these canyons. Consideration of the removal and recompaction of these deposits, and the notable depth of planned fill (over 50 feet in most cases), renders the potential for liquefaction to occur at the site as very low and not a constraint to the development.

Exploration with Whites Canyon should be performed to determine depths of removal upon notice from the project environmental consultant that necessary dozer work (to obtain access from hillside terrain) is permissible.

Dry Seismic Settlement

During seismic groundshaking, seismically induced settlement can occur. The estimation of the potential seismic settlement is divided into two separate causative mechanisms. The settlement of coarse grained soils above the groundwater table is assumed to be related primarily to groundshaking adjusting the coarse grained soils into a tighter packing configuration. The seismic settlement below the groundwater is assumed to be related to pore pressure changes during liquefaction. Since surficial materials of low relative density (such as alluvial, colluvial, landslide debris, and terrace deposits) are anticipated to be removed during the grading of the site, the potential for dry seismic settlement to impact the site is considered very low.

Tsunamis and Seiches

Review of the site's location in elevated terrain, the potential for tsunamis and seiches to impact the site is considered negligible.

HYDROCONSOLIDATION POTENTIAL

Hydroconsolidation is a condition where dry or moist soils undergo settlement upon being wetted. In many cases no additional surcharge load is necessary to trigger the hydroconsolidation.

The potential for hydroconsolidation has been evaluated based upon the results of consolidation tests performed on samples taken from the excavated borings, and from our observations of the density of the materials encountered. Consolidation testing performed on bedrock formations indicate that they are not susceptible to hydroconsolidation on account of their high density and lithified state. The very minor collapse (typically <0.5%) observed in such tests is attributed to sampling and handling disturbance.

Consolidation testing from samples of alluvium on the Sierra Highway portion of the site indicate that alluvial soils are susceptible to hydroconsolidation and should be removed in areas of

proposed improvements. Sampling of the alluvial deposits in the remaining portions of the site was impeded by: (1) the notable coarseness of the deposits (cobble and boulder-rich) and (2) impeded access for exploratory excavation due to environmental concerns. Based on our experience, we anticipate alluvial deposits in the tributary drainages to be relatively thin and requiring removal and recompaction. Within Whites Canyon, alluvial deposits are notably coarse, consisting essentially of lag deposits of cobbles and boulders with a poorly-sorted sand matrix. Due to the notable depth of planned fill, these materials should be removed and replaced within engineered fill, thus mitigating their potential for hydroconsolidation.

Consolidation testing and subsurface observations of terrace deposits, colluvium, and slopewash on the site indicate that these materials have a potential for hydroconsolidation. These materials should be removed and recompacted to bedrock within areas of planned development. Much of these materials will be removed by the planned cuts.

FAULTING AND SEISMICITY

The subject site contains no known active or potentially active faults, nor is it within an Alquist-Priolo Fault Rupture Hazard Zone. Therefore, the potential for ground rupture is considered to be very low. However, the property is situated within the seismically active Southern California region and ground shaking is likely to occur due to earthquakes caused by movement along nearby faults.

One method of seismic design is to utilize the Static Force procedure (structures less than five stories) presented in the Uniform Building Code (UBC), which can be used to estimate base shear/on-site acceleration based upon site location, occupancy classifications, and the planned structural system. The program UBCSEIS (Blake) was utilized to determine appropriate design parameters (See Appendix A).

For the 1997 UBC this site has a Seismic Zone Factor, Z of 0.4 (Tbl 16-I), the Soil Profile Type is considered S_D (Tbl 16-J) on account of the numerous deep fills anticipated. The Seismic Source Type is considered B (Tbl 16-U), and the Near Source Factors are estimated as N_a of 1.0 and N_v of 1.2 (Tbl 16-S & 16-T). The nearest Type B fault is the Sierra Madre (San Fernando) fault, located approximately 6.2 kilometers to the south. The San Gabriel fault, another Type B fault, is located approximately 6.8 kilometers from the site. The nearest Type A fault is the San Andreas fault, located roughly 23 kilometers away.

Another method of seismic design is to assess the potential on-site ground acceleration based upon a site's proximity to specific, known faults. This relies upon prediction of a maximum earthquake for each fault considered, relationships which characterize the diminution of ground response with distance from the causative event, and relationships which assess impact of site-characteristics upon ground response. One commonly used method of estimating possible on-site accelerations is the probabilistic seismic hazard analysis.

Probabilistic Analysis - Simplified Prescribed Parameter Value

We have employed the Simplified Prescribed Parameter Value Method for the estimation of peak ground acceleration during a design level seismic event (10% probability of occurrence in 50 years, per 1997 UBC). Figures presented in the Seismic Hazard Evaluation Report of the Mint Canyon 7.5' Quadrangle were reviewed for the selection of peak ground acceleration and magnitude. Based on the referenced document, a peak ground acceleration of 0.58g is anticipated the subject property (for a soft rock condition), with a predominant earthquake magnitude of M=6.6, for a design level event. Copies of Figures 1.2 and 1.3 from the Seismic Hazard Evaluation Report are provided in Appendix A.

Seismic Discussion

The methodology in the Uniform Building Code intends to protect and preserve life and limb. It has, apparently, been successful in that regard. On that basis, we recommend minimum structural design be in compliance with the seismic design provisions of the UBC. Design per the UBC (and hence adoption of the philosophy that life and limb need be protected) is commensurate with the local building ordinance. Being that higher standards of design (i.e. that intend to minimize property damage in the case of a much less likely event) have not been adopted by the governing agency (which is responsible for setting such standards), use of a higher acceleration (than provided by the UBC) is discretionary.

LABORATORY TESTING

Undisturbed and bulk samples of soil and rock materials encountered at the site were collected during the course of our field work. Selected laboratory tests completed on the retrieved samples are described below:

Moisture-Density

The field moisture content and dry unit weight were determined for each undisturbed sample. Dry unit weight is expressed in pounds per cubic foot and the moisture content represents a percentage of the dry unit weight. This test data is presented on the boring logs.

Shear Test

Shear tests were performed in a Direct Shear Machine of the strain control type. The rate of deformation is approximately 0.01 inches per minute. Selected samples, as noted in the shear test diagram, were sheared at reduced rates of deformation. Shearing occurred under a variety of confining loads in order to determine the Coulomb shear strength parameters. The test was performed on undisturbed and remolded (@ 90% relative compaction) samples in an artificially

saturated condition. The test results are presented in Appendix B.

Consolidation Test

Settlement predictions of the soil's behavior under load are made on the basis of consolidation tests. A one inch high sample is loaded in a geometric progression and the resulting deformation is recorded at selected time intervals. Porous stones are placed in contact with the sample (top and bottom) to permit addition and release of pore fluid. The sample is inundated at a selected load (typically near overburden pressure) during the progression. Results are plotted on the enclosed Consolidation-Pressure Curves included in Appendix C.

Compaction and Expansion Tests

To determine the compaction characteristics of the onsite materials, compaction tests are performed in accordance with ASTM D 1557-00. The maximum dry density is reported in pounds per cubic foot and the optimum moisture content as a percentage of the maximum dry density. Expansion index tests were performed in accordance with the criteria in U.B.C. 18-2. The results of these tests are included in Table I.

Table I - Laboratory Test Data

Sample	Description	Maximum Dry Density PCF	Optimum Moisture Content %	Expansion Index
B2@11-15'	Tan silty SAND (Saugus Fm.)	134	8	6
B3@5'	Tan clayey silty SAND (Saugus Fm.)	127	9	0
B3@38'	Lt. gray silty SAND w/ grave. (Mint Cyn.Fm.)	132	10	0
B9@15'	Lt. brown sandy SILT	124	11	19
B10@20'	Tan clayey med-cs SAND w/ gravel	137	7	4
B16@60'	Dark red sandy CLAY (TQs)			56
B19@15'	Tan silty f-cs SAND w/ gravel	128	10	10
B1(1995)@15'	Gray silty SAND w/ gravel	133	7	
B1(1995)@35'	Lt gray silty med-cs SAND	131	9	
B1(1995)@72'	Lt. gray clayey silty SAND	125	10	
B11(1995)@40'	Lt. gray clayey SAND	130	10	
T3@1.5'	Brown clayey silty f-med. SAND	126	9.5	

Atterburg Limits and Sieve Analyses

Selected fine-grained samples were subject to particle-size analyses, hydrometer analyses, and Atterburg Limit testing. The results of this testing is presented in the following table.

Sample	Liquid Limit	Plastic Limit	Plasticity Index	% Clay (passing 0.005 mm sieve)
B5@12' (TQs)	36.9%	18.9%	18	19%
B5@72' (Tmc)	40%	20.7%	20	9%
B13@27' (Tmc)	38.4%	17.4%	21	25%
B16@60' (TQs)	42.7%	15.9%	27	---
B16@63' (TQs)	57.5%	18.2%	40	---
B16@80' (TQs)	91.9%	32.2%	60	90%
B21@49' (TQs)	57.9%	18.2%	40	50%
B23@70' (TQs)	84.3%	27.3%	57	86%
B25@53' (TQs)	46.7%	19.2%	28	12%

CHEMICAL TESTING

Selected samples were submitted to M.J. Schiff and Associates for chemical testing to evaluate their corrosion potential. Results presented in Appendix E are summarized herein.

Sulfates

Preliminary testing of samples obtained from our borings indicate the on-site soils have low levels (< 150 ppm) of sulfates which indicates a low corrosion potential for concrete. Near the completion of grading additional testing should be performed to verify the corrosion potential of the soils.

TABLE 19-A-4 REQUIREMENTS FOR CONCRETE EXPOSED TO SULFATE-CONTAINING SOLUTIONS

SULFATE EXPOSURE	WATER-SOLUBLE SULFATE (SO_4) IN SOIL, % by weight	SULFATE (SO_4) IN WATER, ppm	CEMENT TYPE	Maximum Water-Cementitious Materials Ratio, by Weight, Normal-Weight Aggregate Concrete[1]	Minimum f'_c Normal Weight and Lightweight Aggregate Concrete, psi[1] x 0.00689 for MPa
Negligible	0.00 - 0.10	0 - 150	--	--	--
Moderate[2]	0.10 - 0.20	150 - 1,500	II, IP(MS), IS(MS)	0.50	4,000
Severe	0.20 - 2.00	1,500 - 10,000	V	0.45	4,500
Very severe	Over 2.00	Over 10,000	V plus pozzolan[3]	0.45	4,500

1 A lower water-cementitious materials ratio or higher strength may be required for low permeability or for protection against corrosion of embedded items or freezing and thawing (Table 19-A-2).
2 Seawater
3 Pozzolan that has been determined by test or service record to improve sulfate resistance when used in concrete containing Type V cement.

Chlorides

Test results indicate that chloride levels (40 to 210 ppm) are below levels of concern with respect to corrosion.

pH levels

Test results presented in Appendix E indicate the on-site soils are typically neutral to slightly basic (pH 7-8).

Soil Resistivity

Representative samples of the earth materials encountered at the site was tested for resistivity. Resistivity of soils is inversely proportional to corrosiveness. Thus, the analysis helps in determining whether the soils may have a deleterious affect on underground metallic structures. A generally accepted correlation between resistivity and soil corrosiveness toward metals is provided below:

Resistivity (Ohm-Centimeter)	Corrosiveness
< 1,000	Severely Corrosive
1,000 - 2,000	Corrosive
2,000 - 10,000	Increasingly Moderate
> 10,000	Increasingly Mild

Laboratory Test Results

Sample	As-Received Resistivity ohm-cm	Saturated Resistivity ohm-cm
B2@10-15'	930,000	1,700
B9@15'	7,400	690

Based on these test results, the on-site soils are considered corrosive to severely corrosive to ferrous metals when saturated. Appropriate mitigation measures should be obtained from an experienced corrosion engineer.

SLOPE STABILITY

Much of the sloping terrain on the site has been delineated within Seismic Hazard Zones with the potential for earthquake-induced landsliding. These zones typically include areas where landslides or adverse bedding conditions are readily evident.

Stability analyses of the planned and natural slopes were performed using the computer software entitled XSTABL which is based on the program PCSTABL5 developed at Purdue University. Program output includes a description of the problem, including soil boundaries, soil properties, earthquake loading, searching criteria, and the method of safety factor calculation. Information regarding the ten trial surfaces with the lowest computed factors of safety is also provided. Graphical depictions of the ten most critical failure surfaces and all failure surfaces considered are presented on the final two sheets of each analysis. Pseudostatic analyses (when bedding dips exceed 12°) utilize a pseudostatic coefficient of 0.15 in accordance with LACDPW

requirements.

Across-Bedding Shear Strengths

Direct shear testing of undisturbed samples of the materials encountered at the site were performed in order to develop representative "across-bedding" strengths. Composite plots of the shear strength tests data are presented on Plates STQs (Saugus Fm.), STmc (Mint Canyon Fm.), and Saf (eng. fill) of Appendix B.

Along-Bedding Strengths

In order to determine along-bedding strengths for the Saugus and Mint Canyon Formations, multi-cycle residual shear tests and correlations (per SCEC, 2002 and Stark and McCone, 2001) were performed on selected fine-grained samples. As noted in the boring logs, fine-grained lithologies are relatively infrequent in the Saugus Formation, and somewhat rare in the Mint Canyon Formation within the subject property. Graphs associated with the Stark and McCone (2001) correlations are presented on Plate SC1 of Appendix B. Liquid limit and % clay results were utilized to generate "ball-milled" liquid limits and "ball milled" clay fractions from which residual friction angles were estimated. Nonlinear shear strength envelopes were generated (see Plate SC2) and friction angles corresponding from the 3 to 10 kip normal pressure range (corresponding to typical slope geometries considered herein) are presented in the following table.

Sample	"Ball-Milled" Liquid Limit	"Ball-Milled" Clay Fraction	Angle of Internal Friction per Stark & McCone (2001) Correlation
B5@12' (TQs)	47%	25%	20 deg.
B5@72' (Tmc)	51%	<15%	24 deg.
B13@27' (Tmc)	49%	37%	19 deg.
B16@80' (TQs)	138%	99%	7 deg.
B21@49' (TQs)	79%	58%	10 deg.
B23@70' (TQs)	125%	95%	7 deg.
B25@53' (TQs)	61%	25%	17 deg.

Along-Bedding Bedding Strength for Sheared TQs Clays

Review of the descriptions for the Saugus Formation clay samples indicate they all have reddish brown to dark red coloration, but vary in their residual strengths. Hence, sheared claystone beds of the Saugus Fm. can be grouped into two strength categories: (1) claystones (such as B5@12' and B25@53') with friction angles between 17 and 20 deg., and (2) weak claystones with notably low friction (phi = 7 deg.). We have utilized the lower strength for specific cases where such low friction angle sheared clays are documented.

Along Bedding Strength for Unsheared TQs Clays

Numerous claystones encountered in the Saugus Formation did not exhibit shearing and thus do not warrant use of the lowest residual friction angle. A shear strength of phi=17°, c=150 psf has been utilized to model such unsheared beds, and corresponds to the correlations obtained for the B5@12' and B25@53' samples.

Along Bedding Strength for Coarse-Grained Lithologies (Tmc and TQs)

The along bedding shear strength of phi=25°, c=100 psf was utilized to model slopes with daylighted bedding conditions that have boring data confirming the lack of fine-grained beds. This strength is considered representative of a through-going poorly cemented sandstone.

Along Bedding Strength for Tmc Sheared Clays

Correlations performed for Mint Canyon Formation claystones indicate that they have relatively high (19° to 24°) friction angles. Based on our experience with claystones of this formation from nearby sites, we have used a conservatively lower shear strength of phi=12°, c=150psf for sheared clays of the Mint Canyon Formation.

The following shear strengths were utilized in our analyses (unless specified otherwise in the

following paragraphs):

Material Type	Cohesion (psf)	Angle of Internal Friction (degrees)
Engineered Fill	200	34
Alluvium	0	30
Landslide Debris	200	30
Saugus Formation Across-Bedding Strength	225	40
Mint Canyon and Saugus Fm- Along Bedding Strength, Coarse-grained Lithologies	100	25
Saugus Formation Along Bedding, Fine-grained Lithologies, Unsheared	150	17
Saugus Formation Along Bedding, Fine-grained Sheared Lithologies	150	7
Mint Canyon Formation Across-Bedding Strength.	200	40
Mint Canyon Formation Along Bedding, Fine-grained Sheared Lithologies	150	12

Cross Section B-B'

The 150 feet high, 2:1 cut slope illustrated in Cross Section B-B' is anticipated to encounter laterally-supported Saugus Fm. within its upper reaches, and potentially daylighted bedding near its toe (based on B25 and B26). An anisotropic strength range (17 to 22 degrees) was applied to the Saugus Formation from x=0' to x=560' to model this adverse bedding condition. An along-bedding strength of phi=5°, c=750 psf was used based on Plate S26.53m. A buttress key width of 210 feet, and depth of 5 feet, along with a 2:1 backcut were required to achieve satisfactory factors of safety with Spencer's Method.

Cross Section C-C'

This 130 feet high, 2:1 cut slope is anticipated to expose daylight bedding of the Saugus Formation. Data from B16 indicates that the majority of the Saugus Fm. consists of interbedded sandstone and conglomerate, with relatively shallow dips. However, a series of relatively thin red sheared clay beds were encountered. In particular, the clay at 80 feet was considered the most

critical, on account of its location, dip inclination, and low friction angle correlation. Analyses for a buttress design targeted this bed (for which a 21° dip was recorded) in order to demonstrate the feasibility of buttressing this slope, assuming this weak bed is continuous. This resulted in a key width of 150 feet and depth of five feet, along with a 2.75:1 backcut. Satisfactory factors of safety of 1.5 (static) and 1.12 (pseudostatic) were obtained with Spencer's Method.

A higher friction angle (10 deg.) was utilized in our backcut analyses for C-C'. A 2.75:1 backcut provides for a temporary factor of safety of 1.3.

We anticipate that additional exploration in this area will demonstrate a lack of continuity of these clay beds. In addition, multi-cycle residual shear strength testing on these materials may warrant an increase in along-bedding strength, and thus help reduce key width dimensions and steepen backcut angles.

Cross Section D-D'

Data from B17 indicates that coarse-grained lithologies are present to a depth of 95 feet within the Saugus Formation. Between 95 feet and 132 feet, isolated red claystone (some with sheared textures) were encountered. Dip inclination and directions were highly variable on account of the abundance of conglomerates.

The slope was modeled with two soil types for the Saugus Formation corresponding to the coarse-grained strata (0 to 95 feet) and the strata containing the clays (below 95 feet to 132 feet). Below 132 feet, entirely coarse-grained lithologies of the Mint Canyon Formation were encountered. The Saugus Formation was modeled with bedding inclinations of 4 to 8 degrees on the basis of the formation's regional dip and the more consistent bedding dips of B16 and B23 (to west and east). The Mint Canyon Formation was modeled with a dip of 15 to 20 degrees but does not contribute to critical geometries since its entirely coarse-grained strata is documented by B17.

A 180 feet wide, 5 feet deep key provides for a factor of safety of 1.6 for the most critical geometries which pass through the clay-bearing strata of the Saugus Formation. For the backcut analysis, the along bedding friction angle was modestly increased to 10° in light of the temporary condition. A temporary factor of safety of 1.26 was obtained for a 2.75:1 backcut.

Cross Section E-E'

Attitudes obtained from B23 indicate that bedding of the Saugus Formation is laterally supported with respect to the perimeter cut slope illustrated in Cross Section E-E'. This slope was analyzed with circular failures surfaces; static and pseudostatic factors of safety of 2.33 and 1.62 were obtained respectively.

Cross Sections G-G' and I-I'

Boring 18 was advanced 200 feet to determine the structure and stratigraphy underlying this 2:1 cut slope. The upper 119 feet consist of massively bedded conglomerate and sandstone. At a depth of 119.5 feet, a sheared mudstone was encountered. Attitudes below this depth rendered southerly dips, typically between 25 and 30 degrees. Sections G and I were evaluated considering the phi=12°, c=150 psf along-bedding strength below the 119.5 foot depth. A buttress key width of 80 feet and depth of 5 feet was found to provide adequate factors of safety for both sections (see Plates G and I of Appendix D).

Cross Section H-H'

Boring 22 indicates that this proposed cut slope is underlain by massively bedded sandstone and conglomerate. Attitudes obtained by the downhole camera reader generally flat apparent dips relative to the section. Since the prevailing structure of the Mint Canyon is known to dip to the west, we considered it prudent to model the slope with a dip of 5-12° and the coarse-grained along bedding strength. An 80 foot wide by 5 foot deep buttress provides a static factor of safety of 1.76. A 2:1

backcut yields a temporary factor of safety of 1.57.

Cross Section K-K'

In light of the forgoing discussion and analyses for Section H-H', the portion of slope illustrated in Section K-K' has been provided a W=60 feet, D=5 feet keyway.

Cross Section L-L'

The projection of Boring 24 indicates that this natural and planned cut slope is underlain by sandstone and conglomerate (devoid of fine-grained beds) of the Saugus and Mint Canyon Formations, with shallow westerly dips (based on dip inclinations from core samples, assuming adverse dip direction). A buttress fill width of 70 feet and depth of 5 feet provide for adequate factors of safety (see Plates L.1-L.5, Lp.1-Lp.5, and Lb.1-Lb.5) and also provides for re-facing of the slope to mitigate surficial issues with uncemented zones and cobbles. A 2.5:1 backcut provides a temporary factor of safety of 1.62.

Cross Section M-M'

Boring 10 and the project of Boring 24 indicate that the westerly facing cut and natural slope is underlain by coarse-grained lithologies of the Saugus and Mint Canyon Formations. These units dip shallowly to the west and have been modeled as 5 to 10 degrees for the Saugus Fm. and 10 to 15 degrees for the Mint Canyon Formation. Along-bedding values of phi = 25 deg. and C=100 psf were utilized on account of the lack of fine-grained lithologies in both formations.

A buttress key width of 60 feet and depth of 5 feet provide for factors of safety of 1.87 (static) and 1.25 (pseudostatic). A 1.9:1 backcut yields a temporary factor of safety of 1.45 .

Cross Section N-N'

Data from B9 indicates that the Mint Canyon Formation dips very shallowly to the northwest, rendering very shallow to neutral apparent dips relative to the section. The Saugus Formation has

shallow westerly dips but lacks fine-grained beds and thus translational analyses are not warranted.

Cross Section O-O'

The proposed 2:1 cut slope at the southerly end of Section O-O' is anticipated to expose northwesterly-dipping Saugus Formation based on B10. Data from B10 and the numerous borings which penetrated the Saugus-Mint Canyon Formation contact have indicated a lack of sheared clays within the Saugus Formation in this portion of the site. Hence, the unsheared claystone strength of phi=17°, c=150 psf was utilized. An out-of-slope dip range of 5 to 9 degrees was considered and a buttress key width of 70 feet, and depth of 5 feet was required to demonstrate an adequate factor of safety for the static condition (see Plates O.1-O.5). The 1.5:1 backcut has a temporary factor of safety of 1.29.

Cross Section R-R' - Southerly Buttress

Similar conditions were modeled for this southerly Section of R-R' as for Section O-O'. A key width of 60 feet and depth of 5 feet provided for a static factor of safety of 1.87. The 1.75:1 backcut provides a temporary factor of safety of 1.42.

Cross Section P-P' - Stability Fills

Data from B6(1995) and B11(1995) indicate that the Saugus and Mint Canyon Formations to be exposed in the tall cuts associated with this section of Whites Canyon Hwy. contain friable, uncemented zones (prone to caving in borings) and large cobbles and boulders. While predominantly massively-bedded, both formations dip shallowly to the west and are thus laterally-supported with respect to this section. Due to the potential for poor surficial performance (erosion and rockfall), we recommend the stabilization of these tall cut slopes as illustrated in the section (upper and lower keyways, separated by a 20 foot wide bench).

Due to the height of the slope, rotational analyses were performed for the southwesterly-

facing slope. Factors of safety of 2.3 (static) and 1.56 (pseudostatic) were obtained.

Cross Section R-R' - Descending Natural Slope Setback

The westerly end of Cross Section R-R' illustrates a steep, descending natural slope condition. Bedding of both the Saugus and Mint Canyon Formations is anticipated to be laterally-supported based on the available subsurface data. A shallow landslide has been mapped within the lower portion of the slope and has been assumed absent in our rotational mode of failure slope stability evaluation.

Substandard factors of safety were obtained within the outer 50 feet of the proposed daylight cut lot illustrated in Cross Section R-R'. Accordingly, a preliminary slope setback line (50 feet from the top of slope) has been incorporated on the Remedial Grading Map (Plate 1.3). Further evaluation of the adjacent daylight cut lots should be performed at the grading plan stage to provide design-level slope setbacks.

Cross Section S-S'

This 2:1 fill slope was evaluated with rotational failures on account of its tall height. Factors of safety of 1.87 (static) and 1.29 (pseudostatic) were obtained.

Cross Section T-T'

This fill slope was also evaluated with rotational failure surfaces. Factors of safety of 1.9 (static) and 1.3 (pseudostatic) were obtained.

Cross Section V-V'

Attitudes obtained from B21 indicate that the southwesterly-facing portion of this cut slope shall expose daylighted bedding with dips of 7 to 12 degrees. The majority of the Saugus Formation encountered consisted of sandstone and conglomerate with isolated claystones which did not exhibit shearing. Boring 1 (nearby) encountered entirely coarse-grained materials and met with refusal. A

buttress key width of 130 feet and depth of 5 feet provide for a static factor of safety of 1.78. The 2.4:1 backcut provides a temporary factor of safety of 1.37.

Cross Section Y-Y'

These cut slopes shall be subject to a daylighted bedding condition based on B5 and surrounding attitudes. No shearing was noted in fine-grained materials within B5 which projects into the section. A key width of 40 feet and depth of 5 feet, along with a 30' by 5' key for the ascending slope above "Main Street South" provide adequate factors of safety. A 2.6:1 backcut provides a temporary factor of safety of 1.75.

Surficial Stability Analyses of 2:1 Cut and Fill Slopes

Surficial stability analyses have been performed for the Saugus Fm., Mint Canyon Fm., and engineered fill, assuming a 2:1 gradient and saturated thickness of 4 feet. The results of these analyses are presented on Plates A.1, A.2, and A.3 of Appendix D. Factors of safety in excess of 1.5 were obtained.

Surficial Stability of Natural Slopes

Geologic mapping of the site indicates that surficial instability of the natural slopes commonly occurs at gradients of 1.25:1 or steeper within thin, sandy surficials soil in the form of shallow isolated soil slips. The most common occurrences of such features are along the sides of steeply incised canyons such as Whites Canyon. These features will be removed by the proposed grading and removals.

Review of the Tentative Tract Map indicates that a few lots are exposed to ascending natural slope conditions. These areas are discussed in the following sections.

Easterly Daylight Fill of Whites Canyon

Several lots, a water tank site, and park site are located at the toe of a natural slope ranging

in height from 25 to 100 feet. Slope gradients of this slope are typically 2:1 or flatter. In order to protect these improvements from potential surficial instability, we recommend the incorporation of a 2:1 slope from the edge of these pads down to the daylight. This slope should be between 4 feet in height for the smaller sections of natural slope, and up to 7 feet in height for the taller sections. A paved swale should be provided along the toe/daylight to convey water and eroded materials to an appropriate inlets or small basins.

Lots West of Section C-C'

Three lots appear to be exposed to a tall ascending natural slope. As discussed above, a false slope should be provided along the edge of these pads down to the daylight in order to protect the lots from potential surficial instability. A paved swale should be provided to convey water and eroded material to an appropriate inlet or basin.

FINDINGS AND RECOMMENDATIONS

Based on our exploratory finding, analyses, we consider the proposed development of the Tentative Tract No. 060922 to be feasible with respect to geotechnical considerations. The following recommendations are presented for your consideration in the grading and development of the site.

Removals

The following materials are considered unsuitable for support of the proposed grading and building construction: existing fill soils, colluvial deposits and slopewash, alluvial deposits, landslide debris, and terrace deposits. These materials should be removed and recompacted in the grading of the site. The approximate limits and depths of removals are illustrated on the enclosed Plate 1.3.

Groundwater may be encountered during alluvial removals in the lower reaches of Whites Canyon within the southerly portion of the site. However, the notable amount of cobbles and boulders in these deposits should support grading equipment even when saturated. Dewatering may

be considered to facilitate removals in some cases.

Subdrains

Following canyon removals, subdrains should be installed in order to provide subsurface drainage along the fill-bedrock contact. Details regarding typical canyon bottom subdrain construction is illustrated in Plate GS1 of Appendix F. In the case of the Whites Canyon drainage and other subdrain runs exceeding 2000 feet, the double 8" pipe configuration of Plate GS1B should be utilized. Where removals extend below depths of viable outletting at the toe of a slope, a canyon-side subdrain should be installed in accordance with Plate GS1A. A cut-off wall should be installed (in accordance with Plate GS2) at least 20 feet before each outlet location, with solid pipe utilized between the wall and the outlet.

The approximate locations of proposed subdrains are provided on Plate 1.3. These locations should be revisited at the 40-scale grading plan stage. All subdrains and backdrains should be surveyed by the project civil engineering during the grading of the site and presented on an as-built map.

Oversize Materials and Rock Disposal

Exploratory logs and geologic mapping of the site indicate that a significant amount of oversize rock in the form of crystalline igneous and metamorphic cobbles and boulders are present on the site. These materials will be encountered in colluvial soils, alluvial soils, and conglomerate beds of both formations. We do not anticipate such rocks to break down under normal grading equipment or operations.

Such materials will create difficult excavation conditions both in canyon removals and in planned cuts. We anticipate much of these materials to require placement in canyons as windrows in accordance with traditional rock disposal methods and in accordance with Plate RD of Appendix

F. Additional handling should be anticipated as finish grade is approached to remove oversize rock from the engineered fill.

In addition to such rock disposal measures, we anticipate a significant amount of oversize rock to remain towards the later part of grading as material is generated from the conglomerate beds of the bedrock formations. The disposal of this material towards the later part of grading should be considered. Possible solutions include: crushing for use as base, exportation, use on site as rip-rap, or leaving a designated rock disposal canyon low towards the later portion of grading.

Rippability

Based on our recovery and Rock Quality Designations from the cored borings, deep cuts within the Saugus and Mint Canyon Formations are not anticipated to require blasting. Several bucket-auger borings met refusal prior to their planned depth on account of hard, crystalline cobbles and boulders within the conglomerate beds. Such beds may be problematic but excavatable. Cementation within both bedrock formations was found to be poor to moderate, and not at levels anticipated to require blasting.

Street or Lot Overexcavation for Trenching Considerations

Where encountered, conglomerate beds may create problematic trenching conditions for foundations, storm drains, and utilities. We suggest consideration of the overexcavation of such beds (where encountered during grading) to provide for more uniform and easier trenching conditions. Oversize rock from the excavated material would require separation prior to its reuse as engineered fill within the upper 10 feet of fill. The delineation of such areas would be best determined in-grading.

Buttresses and Stability Fills

Based on the data available to date, westerly-facing and some southwesterly-facing slopes

are scheduled for buttress or stability fills. Perimeter slopes were evaluated to demonstrate the feasibility of buttressing. Slopes within the interior of the site are obviously feasible to buttress since property lines do not constrain any backcuts. At the 1"=40' scale grading plan stage, interior slopes with daylighted bedding conditions should be analyzed for appropriate buttress design. At this time, we have assigned stability fill key dimensions for planning purposes.

Tall cut slopes in the southerly portion of the site are anticipated to expose friable, uncemented bedrock zones and large cobbles and boulders. We anticipate several of these slopes to require stabilization in order to mitigate the potential for raveling and dislocation of cobbles and boulders. Typical stability and buttress fill construction are provided in Plates GS4 and GS5 of Appendix F. All stability fills and buttresses should be provided with backdrains in accordance with Plate GS6.

Generalized stability fill key dimensions for the "re-facing" of planned cuts slopes for the reasons discussed above are provided in the following table.

Slope Height	Key Width (feet)	Key Depth (feet)
< 30'	20	5
< 45'	25	5
< 60'	30	5
< 75'	40	5
< 90'	50	5
< 105	60	5
< 130	70	5

Expansive Soils and Expansive Bedrock

The vast majority of soils encountered are anticipated to be within the very low (0-20) and low (21-50) expansion index ranges. Either conventional or post-tension foundations may be utilized.

Expansive lithologies were encountered within the westerly portion of the site within the Saugus Formation. These expansive beds typically consist of reddish brown sandy clay (paleosol). Such beds will require overexcavation where encountered within lots and streets in order to mitigate the potential for differential expansion. The depth of such overexcavation typically ranges between 7 and 10 feet.

Sulfates and Corrosivity

Based on our laboratory testing and that performed on similar soils from the adjacent developments, we anticipate sulfate contents to be relatively low (< 150 ppm). Special concrete design is not anticipated.

As with the majority of soils in the Santa Clarita Valley, chemical testing has shown them to be corrosive to ferrous metals. Appropriate mitigation measures should be incorporated in the project design.

Transition Lots and Fill Caps

To provide uniform foundational support for future structures, we recommend the creation of fill caps for cut/fill lots. Shallow cut lots and cut/fill lots should be provided with a minimum five feet cap of compacted fill. Cut/fill lots underlain by 10 feet or less of compacted fill on the fill portion of the lot should have the cut portion overexcavated a minimum of 5 feet below finish grade and replaced with compacted fill, thus providing a fill cap with a minimum 5 feet fill thickness. For those transition lots with 10 to 20 feet of fill on the fill side, the cut side should be provided with a minimum 7 feet thick fill cap. For those transition lots with in excess of 20 feet of fill on the fill side, the cut side should be provided with a minimum 10 feet thick fill cap. Fill caps should extend a minimum of 5 feet beyond the perimeter footings.

Where the backslope is 3:1 or steeper, the last bench prior to reaching the undercut should be at least 15 feet in width in accordance with Plate GS7. The 15 feet wide bench is intended to reduce the steep dip of the fill-bedrock contact commonly created during undercutting. Plate GS7 provides a graphical representation of the fill cap construction. Preliminary fill cap depths for transition lots are presented on the enclosed Removal Map (Plate 1.3).

Grading - Engineered Fills

The following recommendations pertain to the placement of, and preparation for, engineered fills;

1. The on-site soils are suitable for use as structural fill. Any import materials that are to be used as structural fill should be approved by this office prior to placement.

2. Shrinkage refers to the lesser volume of fill that results from a given volume of excavation. Conversely, bulking refers to the increase in volume upon excavation of dense material (i.e. bedrock formations) and ensuing placement as engineered fill. The following shrinkage and bulking estimates are provided for your consideration in the earth balance of the site

Earth Material	Estimated Shrinkage	Estimated Bulking
Alluvium (Qal)	10-15%	
Colluvium/Slopewash (Qc)	10-15%	
Landslide Debris	0-5%	
Terrace Deposits	5-10%	
Saugus Formation		4 - 8%
Mint Canyon Formation		5 - 10%

3. Subsidence includes the general lowering of the ground due to in-place compaction by construction equipment. Subsidence is anticipated to range from 1.0 to 1.5 tenths of a foot.

4. All vegetation, trash debris or other deleterious material should be stripped from the area to

be graded. Soils bearing sparse grasses may be thoroughly mixed with at least ten parts clean soil and incorporated into the engineered fill. Other materials should be wasted from the site.

5. Compressible soils that lie within the area to be filled should be removed to relatively incompressible material and replaced as properly compacted fill. Portions of the compressible materials that are sufficiently thin may be scarified, watered or air dried to approximately the material's optimum moisture content, and compacted in-place. The anticipated removal depths are illustrated on Plate 1.3.

6. Fill slopes which toe onto sloping ground should be founded in bedrock, below the compressible surface soils. The key should be at least 20 feet wide and 3 feet deep (measured on the downslope side). The bottom of the key should be graded so that there is at least one foot of fall across its width (toward the upslope side). The key should be located in front of the toe of slope (as shown on the plan) so that the outside limit of the key lies at or beyond a 1:1 projection from the planned toe of the slope. Typical fill key construction is illustrated on Plate GS3.

7. Fill-over-cut slopes should have the fill founded on a 20 foot wide bench cut into the bedrock or, where bedrock is not present in the cut portion of the slope, on a key cut below the toe of the slope. The 20 foot bench should be graded to provide at least 1 foot of fall toward its upslope side. If keyed below the toe of slope, then the key should be at least 20 feet wide, 3 feet deep (below the toe), and tilted (at least 1 foot) into the slope. The cut portion of the slope should be exposed (and observed by a representative of this firm) prior to constructing the fill portion of the slope. Typical fill-over-cut slope construction is illustrated on Plate GS8.

8. Exposed surfaces should be scarified, moistened or air dried as appropriate, and compacted to 90% of the material's maximum dry density prior to placement of fill.

9. Where the ground slopes steeper than 5:1 (H:V), the fill should be properly benched into bedrock. Typical benching is illustrated in Plate GS3.

10. Fill slopes constructed of clean sand are commonly subject to excessive erosion or shallow slope failures. Similarly, fill slopes constructed with clayey soils may be subject to desiccation, cracking, creep or other surficial deterioration. Utilizing mixed soils (sand with some proportion of fines, i.e. clayey sand) in the outer 20 feet of the fill slope may serve to minimize the potential for surficial slope deterioration.

11. Fill materials should be placed in thin lifts, watered to near the material's optimum moisture content (or to near 2% over optimum moisture content, and compacted to the applicable level of relative compaction prior to placing the next lift). Compaction criteria varies depending on the depth of fill as outlined in the following table.

Depth of Fill	Moisture Level	Minimum Relative Compaction
< 20 feet	near optimum	90%
20 to 50 feet	near 2% over optimum	92%
> 50	near 2% over optimum	95%

On account of the primarily sandy nature of the on-site soils, compaction with the high moisture content is not anticipated to be difficult. The intent of this compaction criteria is to reduce the amount and duration of settlement.

12. The 90% relative compaction standard applies to the face of fill slopes. This may be achieved by overfilling the constructed slope and trimming to a compacted finished surface, rolling the slope face with a sheepsfoot, or any method that achieves the desired product.

13. All grading should comply with the grading specifications and requirements of the local governing agency.

SETTLEMENT MONITORING

Several areas of deep engineered fill are planned and approach maximum depths of 140 feet after anticipated removals. While the vast majority of earth materials are coarse-grained and anticipated to consolidate rapidly, settlement monitoring remains a prudent measure. Fills in excess of 50 feet in depth within residential areas be should be monitored to evaluate the rate and amount of settlement.

Surface settlement monuments should consist of 1-inch diameter metal pipe cast, surrounded by a 4 inch diameter solid pvc casing (See Plate SM). Both the pipe and casing should be cast in a concrete pad, founded at least five feet below pad grade. The concrete pad should be at least 2 feet by 2 feet and a minimum of 6 inches in thickness. The pad and a portion of the casing should be backfilled with nonexpansive sand or gravel. Typical settlement monument construction is illustrated on Plate SM. Settlement surveys should be performed at the following intervals:

1) At the completion of settlement monitor construction

2) One week after installation

3) Every two weeks for a period of 2 months following installation.

4) Monthly thereafter as necessary.

The monitors should be surveyed with sufficient precision to allow detection of movements that are on the order of 0.005 feet. The monitoring surveys should be performed in a closed loop, with the originating benchmark in a static location. Monitoring should be continued until plotted survey data indicate that the estimated rate of settlement and estimated remaining settlement is no longer significant.

A total of 60 preliminary settlement monument locations (SM1-SM60) have been illustrated

on the enclosed Plate 1.3 in areas of deep engineered fill. The number and location of settlement monuments should be revisited at the 40-scale grading plan stage. Based on our experience from other sites with similar soils, settlement monitoring for moderate depth fills (50 to 75 feet deep) is anticipated to continue for 9 to 12 months following the conclusion of grading. Monitoring of deep fills (75 to 140 feet deep) is anticipated to continue for 18 to 24 months following the conclusion of grading. We recommend that models and early phases of construction be situated in areas of planned cut. Periodic settlement monitoring reports should be prepared to indicate the status of the monitoring process.

POST-TENSION FOUNDATIONS

Different methods are used to account for the potential effects of expansive soils. One method of mitigation, the California Slab Method (Spanability Method) utilizes deepened footings and pre-swelling of foundation soils. UBC Standard 18-III, 1997, outlines another method, the Post-Tensioned Institute (PTI) Method, which relies upon increased stiffening of post-tension slabs to resist significant soil stresses due to variations caused by climatic conditions. The former attempts to retard soil movement; the latter attempts to minimize slab deflection in the face of soil movement. Recommendations for both post-tension design methods are provided herein.

California Slab (Spanability) Method

This method reduces the potential for the soil to exert expansion-induced stresses by impeding the lateral migration of near-surface moisture. This method has proven successful. When utilizing deepened footings and pre-saturation techniques, the structural design need not employ the methodology from UBC Standard 18-III.

Geotechnical based input parameters for design of this foundation system are based, in part, upon the expansive properties of the soils near pad grade. Samples judged representative of these soils were determined to have an expansion index in the range of 0-20, 21-50, and 51-90. "K" values, span criteria, recommended minimum perimeter footing embedment and pre-saturation guidelines that are commensurate with each range of soil expansiveness are provided in the accompanying table.

Expansion Index	Typical "K" Values	Span Criteria	Exterior Footing Depth	Pre-saturation Depth
0 - 20	900 - 200	4' - 6'	12"	12"
21 - 50	200 - 100	6' - 7'	15"	21"
51 - 90	100 - 40	7' - 9'	21"	27"

Post-Tensioning Institute Method

The potential for differential uplift in this method can be evaluated using the Uniform Building Code (UBC) Section 1816, based on the design specifications of the Post-Tension Institute. The following table presents suggested minimum coefficients to be used.

Suggested Coefficients

Thornthwaite Moisture Index	-20 in/yr
Depth to Constant Soil Suction	5 feet
Constant Soil Suction	3.25 to 3.67 pf

Based on the above parameters, the following values were obtained from figures or tables in the UBC Section 1816. The values may not be appropriate to account for possible differential settlement of slabs due to other factors. If a stiffer slab is desired, higher values of Y_m and E_m can be considered.

Parameter	EI 0 to 50	EI 51 to 90
E_m Center Moisture Variation Distance	5.5 feet	5.5 feet
E_m Edge Moisture Variation Distance	2.5 feet	2.7 feet
Y_m Center Lift	1.5 in.	2.5 in.
Y_m Edge Lift	0.25 in.	0.5 in.

These edge lift values are based on the effects of climatic variations only, as specified in the UBC. In an attempt to account for the potential effects of irrigation, we recommend that horizontal moisture barriers in the form of deepened perimeter beams be used to retard non-uniform surface moisture migration beneath the slab. The bottom of the deepened perimeter beams should be designed to resist tension, using cable or reinforcement per the Structural Engineer. Pre-swelling of the soils must also be used to minimize uplift after construction. For perimeter beam depths and pre-saturation criteria see the previous table in the California (Spanability) Method Section of this report.

The design criteria are considered minimums and may not be adequate to represent worst-case conditions such as adverse drainage and/or improper landscaping and maintenance. Additional protection may be provided by adjusting the edge lift parameters for a greater Thornthwaite Moisture Index value (to simulate irrigation or wetter conditions than the presumptive climatic conditions). This is discretionary. Additional parameters for this modification can be provided upon request.

General Post-Tension Discussion

The allowable bearing capacity may be taken as 1000 PSF at pad grade and 1500 PSF at twelve inches embedment and with a minimum width of twelve inches. This may be increased by one-third for short duration loading, such as by wind or seismic forces. Care should be exercised

to see that all spoils from the slab subgrade are removed or property compacted.

Pre-saturation of the foundation soils should be initiated well before concrete is scheduled to be placed. Care should be taken to see that the water has properly penetrated the soil. Last minute flooding is not a good practice. Excess water remaining in the target pre-saturation zone at the time of concrete placement will penetrate further into the soil, possibly causing additional expansion and uplift of the curing concrete.

A minimum of one inch of sand should be placed beneath the slab. A vapor barrier (i.e., ten mil visqueen) should be installed where moisture penetration of the slab is undesirable.

Other aspects of the design, including but not limited to minimum reinforcement, footing embedment and the need for interior footings, are to be determined by the project structural engineer. However, cold joints (in deepened footings and/or sunken rooms) should not be allowed.

CONVENTIONAL FOUNDATION SYSTEMS

Continuous or pad footings may be used to support the proposed residential and/or accessory structures. In order to achieve the capacities specified below, they should be founded a minimum of 12 inches into bedrock or engineered fill (not partially into each), with the concrete placed against in-place, undisturbed material. Foundation design criteria are based, in part, upon the expansive properties of the materials present near the finished pad grade. Laboratory testing to verify the expansive properties of the near-pad-grade materials should be performed at the completion of rough grading.

Pre-saturation guidelines are presented in the following table. Pre-saturation of the foundation soils should be initiated well before concrete is scheduled to be placed. Care should be taken to see that the water has properly penetrated the soil. Last minute flooding is not a good

practice. Excess water remaining in the target pre-saturation zone at the time of concrete placement will penetrate further into the soil, possibly causing additional expansion and uplift of the curing concrete.

Expansion Index Range	0 - 20
Pre-saturation	12"
Footings[1]	
Allowable Bearing Capacity	1500 PSF[2]
Lateral Resistance	325 PSF/Ft[2] [3]
Maximum Lateral Resistance	2000 PSF [2] [3]
Coefficient of Friction	0.3
Minimum Embedment Into Foundation Material	12 inches
Minimum Embedment Below Adjacent Grade[4]	12 inches
Minimum Reinforcement	2 #4 bars, 1 near top, 1 near bottom
Slabs-On-Grade	
Bedding	2" of clean sand[5]
Thickness	Nominal 4"
Minimum Reinforcement	#4 bars @ 48" o.c.e.w., or #3 bars @ 36" o.c.e.w.

(1) Bearing portions of all footings should be at least five feet (measured horizontally) from the face of adjacent, descending slopes. All footings should bear at least three feet below an imaginary plane projected upward at 1.5:1 from the toe of locally over-steepened slopes. Pad footings should be at least 24 inches square.

(2) May be increased by 1/3 for short duration loading such as by wind or seismic forces.

(3) Decrease by 1/3 when combined with friction.

(4) Applies to exterior footings.

(5) Place vapor barrier (6 mil. visqueen) one inch below top of sand layer beneath all areas where moisture penetration of the slab is undesirable.

Expansion Index Range	21 - 50
Pre-Saturation Depth	21"
Footings[1]	
Allowable Bearing Capacity	1500 PSF[2]
Lateral Resistance	325 PSF/Ft[2] [3]
Maximum Lateral Resistance	2000 PSF[2] [3]
Coefficient of Friction	0.3
Minimum Embedment Into Foundation Material	12 inches
Minimum Embedment Below Adjacent Grade[4]	15 inches
Minimum Reinforcement	2 #4 bars, 1 near top, 1 near bottom
Slabs-On-Grade	
Bedding	4" of clean sand[5]
Thickness	Nominal 4"
Minimum Reinforcement	#4 bars @ 48" o.c.e.w., or #3 bars @ 36" o.c.e.w.

(1) Bearing portions of all footings should be at least five feet (measured horizontally) from the face of adjacent, descending slopes. All footings should bear at least three feet below an imaginary plane projected upward at 1.5:1 from the toe of locally over-steepened slopes. Pad footings should be at least 24 inches square.

(2) May be increased by 1/3 for short duration loading such as by wind or seismic forces.

(3) Decrease by 1/3 when combined with friction.

(4) Applies to exterior footings.

(5) Place vapor barrier (6 mil. visqueen) one inch below top of sand layer beneath all areas where moisture penetration of the slab is undesirable.

Expansion Index Range	51 - 90
Pre-saturation	27"
Footings[1]	
Allowable Bearing Capacity	1500 PSF[2]
Lateral Resistance	325 PSF/Ft[2] [3]
Maximum Lateral Resistance	2000 PSF[2] [3]
Coefficient of Friction	0.3
Minimum Embedment Into Foundation Material	12 inches
Minimum Embedment Below Adjacent Grade[4]	27 inches
Minimum Reinforcement	2 #4 bars, 1 near top,1 near bottom, #3 bars @24" in ext. footing, bend 3' into slab
Slabs-On-Grade	
Bedding	4" of clean sand[5]
Thickness	Nominal 4"
Minimum Reinforcement[6]	#3 bars @ 24" o.c., e.w.

(1) Bearing portions of all footings should be at least five feet (measured horizontally) from the face of adjacent, descending slopes. All footings should bear at least three feet below an imaginary plane projected upward at 1.5:1 from the toe of locally over-steepened slopes. Pad footings should be at least 24 inches square.

(2) May be increased by 1/3 for short duration loading such as by wind or seismic forces.

(3) Decrease by 1/3 when combined with friction.

(4) Applies to exterior footings.

(5) Place vapor barrier (6 mil. visqueen) one inch below top of sand layer beneath all areas where moisture penetration of the slab is undesirable.

(6) Dowel slab to exterior footing using #3 bars @ 24" on center, bent 3' into slab.

Settlement

We anticipate total settlement due to foundational loads to be on the order of 1 inch or less while differential settlement is anticipated to be on the order of 1/4 to ½ inch across a distance of 30 feet.

Settlement associated with consolidation of the deep engineered fills under their own weight is anticipated to be on the order of 2 to 3 inches. Settlement monitoring (as discussed above) is

recommended such that this settlement may be recorded and monitored for consideration of the release of monitored lots.

RETAINING WALL RECOMMENDATIONS

Retaining walls are anticipated in the development plans. Foundation design criteria are provided in the preceding section. Lateral loading criteria for cantilevered wall designs are presented in the table below. Lateral loading criteria for unyielding (basement, braced etc.) walls and walls constructed prior to placement of the fill that the wall is to support may be provided if such are to be utilized in the project.

Lateral Design(1)

Slope of Backfill	Equivalent Fluid Density (PCF)
Level	30
2:1	43

(1) Special design required for wall height in excess of fifteen feet.

All retaining walls should be provided with adequate backdrainage systems. Perforated pipe backdrains should be installed in accordance with Plate RW1. Free draining material should be used around pipe drains and care should be exercised to see that backdrain outlets are installed and maintained above the finish grade adjacent to the face of the wall. Backdrains should outlet to a nonerosive device or surface.

Backfill for retaining walls should be properly compacted. An impervious cap should be provided at the top of the backfill to retard infiltration of water.

Additional surcharge, such as that due to proposed structures, traffic, or other loading, should be included in the wall design. Use of expansive soil as backfill for retaining walls will result in a surcharge to the wall, the magnitude of which is dependent upon the expansion index of the backfill. This may be avoided by using sand or gravel as backfill adjacent to the wall. Details regarding this type of construction may be provided upon request.

SLOPE SETBACKS

Slope setbacks (H/3, max. 40 feet) set forth in the Los Angeles County Building Code should be applied to residences and appertunent structures. The setback should be taken as H/3 where H is the height of the descending slope, with a typical maximum of 40 feet for graded slopes. Structures situated within the setback area will require special foundation design, which might include deepening footings, pile/caisson construction, and/or consideration of creep loads. Recommendations should be developed on a case by case basis.

Daylight cut lots in the vicinity of Cross Section R-R' will be subject to greater setbacks on account of the descending natural slope. At this time, a preliminary 50 foot setback from the top of slope has been demonstrated to provide a factor of safety of 1.5. At the grading plan stage, additional cross sections and analyses should be performed.

RESTRICTED USE AREAS

Landslides (or portions thereof) that remain in-place following the grading of the subject tract will require placement within Restricted Use Areas in accordance with LACDPW requirements. Restricted Use Areas have been illustrated on the enclosed Removal Map (Plate 1.3) for Landslides L9, L21, and L22.

IRRIGATION PRACTICES

The surficial stability of graded slopes is diminished by changes in their moisture content. Permanent changes induced by the drying influence of the sun and the wetting influence of rainfall prior to establishment of plant cover may bear upon long term slope performance.. Maintenance of constant moisture content prior to planting may necessitate covering the slope with plastic sheeting or a polymer spray, regular application of water (during hot weather), or other procedures. Slopes that are not planted directly upon the completion of grading should be evaluated by a representative of this firm after each drying or wetting season.

Control of irrigation and precipitated water will serve to retard the occurrence of seeps. Obviously, minimizing the excess water that infiltrates into the ground will minimize the amount of water that finds its way back to the surface. Considering the above, it should be obvious that all irrigation systems should be adjusted to provide the minimum water needed to sustain landscaping. As general rules, (1) if runoff increases notably during irrigation, then the duration of irrigation should be reduced, (2) if notable run off occurs at the onset of irrigation, then the rate of water application should be reduced, and (3) if wet soils persist below the root zones, then the amount of irrigation should be reduced. Adjustments should be made for changes in the climate. Irrigation should stop when sufficient water is provided by precipitation. Broken, leaking, or plugged sprinklers or irrigation lines should be repaired immediately. Frequent inspections of the irrigation systems should be performed.

DRAINAGE

Positive drainage should be established to carry pad waters away from structures and foundations, and to prevent uncontrolled or sheet flow over manufactured slopes. We recommend as steep a gradient as possible be established around the residence, to the street or other non-erosive drainage devices. Fine-grade fills placed to create pad drainage should be compacted in order to retard infiltration of surface water.

Preserving proper surface drainage is also important. Planters, decorative walls, plants, trees or accumulations of organic matter should not be allowed to retard surface drainage. Area drains and roof gutters (if present) should be kept free of obstruction. Roof gutters (if present) and condensation lines from air conditioners should outlet to area drains or paved areas which conduct the water to the street. Positive drainage along the backs of retaining walls should be maintained. Any other measures that will facilitate positive surface drainage should be employed.

Utility Trench Backfill

Backfill for utility trench excavations should be compacted to at least 90% relative compaction. Where installed in sloping areas, the backfill should be properly keyed and benched.

CONSTRUCTION MONITORING

Finalized grading plans and foundation plans should be submitted to this office. Additional recommendations may be provided at that time, if such are considered warranted.

Placement of all fill and backfill should be monitored by representatives of this office. This includes our observation of prepared bottoms prior to filling. All excavated slopes, both temporary and permanent, should be observed by a representative of this office. Supplemental recommendations may prove warranted based upon the materials exposed in the actual excavations.

Foundation excavations should be observed by representatives of this office to see if the recommended penetration of proper supporting strata has been achieved. Such observations should be made prior to placing concrete, steel or forms. This office should be notified at least 24 hours prior to placing concrete.

111 STATEMENT

Based upon tests conducted as outlined in this and applicable referenced reports, and if constructed in accordance with our recommendations and properly maintained, it is the opinion of the undersigned, a duly registered professional engineer and engineering geologist, that (1) the proposed structure(s) will be safe against hazard from landslide, settlement or slippage, and that (2) the proposed building or grading construction will have no adverse effect on the geologic stability of property outside the building site. The nature and extent of tests conducted for purposes of this declaration are, in the opinion of the undersigned, in conformance with generally accepted practices in this area. Test findings and statements of professional opinion do not constitute a guarantee or warranty, express or implied.

CLOSURE

This geotechnical report has been prepared in accordance with generally accepted engineering practices at this time and location. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

Thank you for this opportunity to be of service. Please do not hesitate to call if you have any questions regarding this report.

Respectfully submitted,
GEOLABS-WESTLAKE VILLAGE

David Sarkisian
C.E.G. 2183

Ronald Z. Shmerling
C.E.G. 1047
R.C.E. 35444

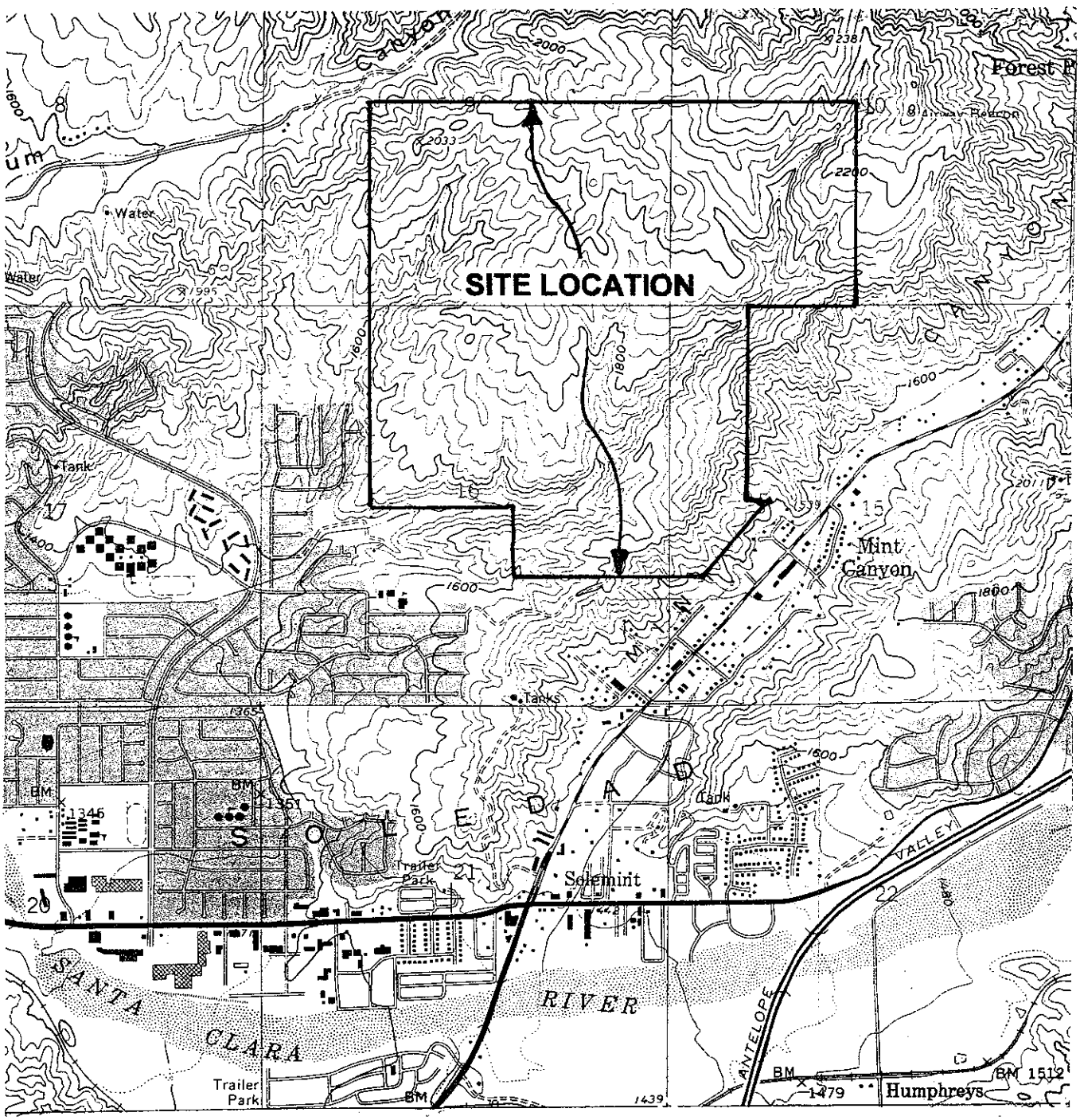
Enclosures:

Location Map	Plate 1.1
Geologic Map	Plate 1.2
Remedial Grading Map	Plate 1.3
Geologic Map (without TTM)	Plate 1.4
Landslide Inventory Map from CDMG OFR98-09	Plate 1.5
Seismic Hazard Zone Map	Plate 1.6
Historical High Groundwater Map	Plate 1.7
Cross Sections	Plates 2.1- 2.11
Boring Logs	Plates B1-B27, B1(1995)-B12(1995), B115 (by PSE)
Test Pit Logs	Plates TP1-TP16, T1-T23
Seismicity Analyses	Appendix A
Shear Test Diagrams	Appendix B
Consolidation Test Results	Appendix C
Slope Stability Analyses	Appendix D
Chemical Test Results	Appendix E
Grading Details	Appendix F
B7-B8 JPG files on Direct CD Rom	CD1
References	Plates R.1 and R.2

XC: (6) Addressee
(3) Sikand Engineering
(2) County of Los Angeles, Land Development

SITE LOCATION MAP

VESTING TENTATIVE TRACT MAP NO. 060922
SKYLINE RANCH, SANTA CLARITA AREA,
COUNTY OF LOS ANGELES, CALIFORNIA



Geolabs – Westlake Village
GEOLOGY AND SOIL ENGINEERING

DATE 3/6/04 BY DS
SCALE 1" = 2000' W.O. 8838

PLATE 1.1

RESPONSE TO LACDPW REVIEW SHEETS DATED MAY 25 AND JUNE 15, 2004 FOR TENTATIVE TRACT 60922, SKYLINE RANCH, SANTA CLARITA AREA, COUNTY OF LOS ANGELES, CA

August 23, 2004
W.O. 8838

GEOLABS-WESTLAKE VILLAGE
Foundation and Soils Engineering, Geology
31119 Via Colinas, Suite 502 • Westlake Village, CA 91362
Voice: (818) 889-2562 (805) 495-2197
Fax: (818) 889-2995 (805) 379-2603
a dba of
R & R Services
Corporation

August 23, 2004
W.O. 8838

Pardee Homes
26650 The Old Road, Suite 110
Valencia, California 91381

Attention: Mr. Wade Lewis

SUBJECT: Response to LACDPW Review Sheets dated May 25 and June 15, 2004 for Tentative Tract No. 60922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

Mr. Lewis:

In accordance with your request, we present herein our responses to the issues raised by the LACDPW Materials Engineering Division in their review of our Tentative Tract Report dated March 6, 2004. Copies of the review sheets are provided in Appendix A for your reference.

The tasks performed for the response included the drilling and sampling of an additional two large-diameter bucket-auger borings, dozer work to provide further access within the site, excavation and logging of an additional seven test pits (TP17-TP23), laboratory testing of selected samples, the revision of the Geologic Map and applicable cross sections, review of pertinent references, additional soils engineering analyses, and preparation of this report. Specific responses to the issues raised by LACDPW are provided later in this report, following brief discussions of the revisions to the Tentative Tract Map design and supplemental data obtained since our March 6, 2004 report.

REVISIONS TO TENTATIVE TRACT MAP

Minor revisions have been made to the Tentative Tract Map by Sikand Engineering and include: changes to interior street layouts and circulation, changes to lot layouts, the

incorporation of eleven basins around the site perimeter, and engineered slopes covering L1. A booster station pad is also proposed adjacent to Lot 766. A total of 1341 residential lots are currently proposed.

SUPPLEMENTAL EXPLORATION AND LABORATORY TESTING

Borings B28 and B29 were advanced in the southerly portion of the site to further define the stratigraphy and geologic structure of the site. Logs are enclosed as Plates B28.1, B28.2, B29.1, B29.2, and B29.3. In addition, seven exploratory test pits were advanced in the main canyon to determine the depth of alluvial deposits. These deposits were found to be notably coarse-grained and contain abundant oversized boulders, commonly in a clast-supported condition (see Plates TP17-TP23).

Samples from borings B28 and B29 were submitted to our laboratory for selected testing. Moisture-dry density test results are presented on the enclosed boring logs (Plates B28 & B29). The results of direct shear tests are provided in Appendix D. Maximum dry density test results are provided in the following table.

Laboratory Test Data

Sample	Description	Optimum Dry Density PCF	Moisture Content %
B29@63'	Saugus Fm. – Tan silty med-cs. SAND	130	9

RECENT LEIGHTON & ASSOCIATES STUDY

A Leighton & Associates report dated April 19, 2004 for Tr. 46018-10 & -11 was reviewed by our office since it included exploration of Qls-9A, and Qls-10 near the northwesterly portion of the subject property. Borings BCW-4 and BCW-5 and trench T-22 did not show evidence of the existence of Landslide Qls-9. We have removed it from our Geologic Map, as

did Leighton & Associates in the referenced report. Copies of Leighton's logs for their borings and test pits are provided in Appendix C.

RAPID DRAWDOWN ANALYSES FOR BASINS

Due to the incorporation of basins around the site, additional cross sections (B1 through B7) were prepared and evaluated for rapid drawdown conditions. Analyses are specifically discussed under Soils Eng. Item #1.

RESPONSES TO GEOLOGIC REVIEW COMMENTS

Item #1 - Landslide L23

Landslide L23 is scheduled for complete removal and recompaction. The Tentative Tract Map has been modified to include a graded slope across the anticipated limits of this removal (See Plate 1.2).

Item #2 - Landslides L1 and L17

Landslides L1 and L17 are scheduled to be completely removed and recompacted to bedrock. The Tentative Tract Map has been modified to include a graded slope over L1 for its reconstruction. In the case of L17, it is located within an area of planned fill, with a daylight fill extending above its head to the easterly ridgeline. The creation of this daylight fill and the mitigation of L17 will require off-site grading.

Item #3 - Buttress Keyway per Section C-C'

The slope illustrated by Cross Section C-C' will require buttressing. Revised slope stability analyses were performed (see Soils Eng. Item #1) and led to a key width of 130 feet and depth of five feet. This keyway has been added to the Geologic Map and Removal Map.

Item #4 - Cross Section O-O'

Cross Section O-O' has been revised to include the recommended stability fill at its

northerly end (W=25', D=5'): (see Plate 2.7).

Item #5 - Depiction of L10 on Cross Sections

Cross Sections U-U' and Y-Y' have been revised to depict Landslide L10 (not L11, see Plates 2.10 & 2.11) at the easterly ends of these sections. This landslide should be removed and recompacted in its entirety during the grading of the site.

Item #6 - Down Dip Cross Sections through Entire Site

Per the request of the Geologic Reviewer, we have prepared Cross Sections AA-AA', BB-BB', and CC-CC' through the entire site in the down-dip direction (see Plate 2.12). These cross sections were drawn with a southwesterly orientation on account of this prevailing orientation of the Saugus Formation and its basal contact across the site. This orientation also captures much of the vertical relief across the site (in comparison to a due-west orientation). Additional discussion with respect to the geologic conditions modeled in our analyses for these sections is provided under Soils Engineering Item #4.

RESPONSES TO SOILS ENGINEERING REVIEW COMMENTS

Soils Eng. Item #1 - Direct Shear Strength Testing

In our March 6, 2004 report, shear strengths for along-bedding bedrock materials were developed through a combination of correlations (Stark & McCone, 2001) and direct shear strength testing. We understand that County policy has yet to accept the Stark & McCone correlations for use in shear strength estimation and slope stability analyses. Accordingly we present herein discussion of the direct shear test results and determination of the shear strengths utilized in this report.

Saugus Formation

A composite plot of multi-cycle shear tests performed on fine-grained Saugus Formation

lithologies is presented on Plate STQsm. As seen, a lower-bound shear strength of phi = 11 deg., C=150 psf is appropriate for use in modeling *fine-grained, sheared* beds of the Saugus Formation. (A shear strength of phi = 12 deg., C=200 psf was utilized by Pacific Soils Eng. and GeoSoils for the adjacent Tr. 46626, while a shear strength of phi = 13.8 deg., C=200 psf was utilized by Leighton & Associates (2004)). This revised shear strength is utilized for Cross Sections B-B', C-C', D-D', AA-AA', and BB-BB' presented herein.

The along-bedding shear strength of phi = 17 deg., C=150 psf passes through the lowermost third of this data and is considered appropriate for *fine-grained, **un**sheared* Saugus Fm. beds. This shear strength was previously utilized for Cross Sections O-O', V-V', Y-Y and remains applicable to those sections. Hence, revised slope stability for those sections are not presented. This shear strength has also been utilized for Cross Section CC-CC', where boring data indicates a lack of fine-grained, sheared lithologies.

The along-bedding shear strength of phi = 25 deg., C=100 psf is applicable to coarse-grained lithologies of the Saugus Formation (and Mint Canyon Formation).

Mint Canyon Formation

Fine-grained beds within the Mint Canyon Formation at the site are generally lacking, as similarly noted in Tr. 46018-10 and -11 of Plum Canyon. In our March 6, 2004 report, a shear strength of phi = 12 deg., C=150 psf was utilized to model the along-bedding strength for fine-grained sheared lithologies of the Mint Canyon Formation. This shear strength is significantly weaker than that used by Leighton & Associates (for the adjacent Plum Canyon project), which was based on the lower mean/median shear strength parameters for along-bedding of the Mint Canyon Formation (phi = 23 deg., C=250 psf) presented in CDMG, 1998. It is also slightly less than the along-bedding shear strength utilized by GeoSoils (1998) for the Mint Canyon

Formation (phi = 12 deg. C=200 psf) for the adjacent (westerly) Tr. 46626. Accordingly, revision of this strength and applicable slope stability analyses from our March 6, 2004 report is not warranted.

For coarse-grained lithologies of the Mint Canyon Formation, an along-bedding strength of phi = 25 deg., C=100 psf was utilized in our March 6, 2004 report. This strength is relatively similar to the along-bedding of the Mint Canyon Formation (phi = 23 deg., C=250 psf) presented in CDMG (1998).

Cross sections which were analyzed for gross stability and required the use of revised along-bedding strengths are discussed herein. The results of the revised analyses are presented in Appendix B.

Cross Section B-B'

The analyses for Cross Section B-B' were revised for the phi = 11 deg., C=150 psf shear strength. Bedding condition described in our March 6, 2004 report remain applicable. A key width of 180 feet, and depth of 5 feet, along with a backcut of 2.2:1 provide for adequate factors of safety with Spencer's Method. The 2.2:1 backcut yields a temporary factor of safety of 1.27 with Spencer's Method.

Cross Section C-C'

This cross section was also reevaluated with the phi=11 deg., C=150 psf along-bedding TQs shear strength. A key width of 130 feet, depth of 5 feet provide for factors of safety of 1.69 (static) and 1.24 (pseudostatic) with Spencer's Method. A 3:1 backcut provides for a temporary factor of safety of 1.26.

Cross Section D-D'

Analyses were revised for the phi=11 deg. C=150 psf along-bedding TQs shear strength.

A factor of safety of 1.62 was obtained for the static condition and a key width of 140 feet and depth of 5 feet. A 2.75:1 backcut yields a temporary factor of safety of 1.25.

Cross Section O-O'

Boring 28 was advanced in the southerly portion of the site to further define the geologic structure and stratigraphy for the north-facing cut slope. Poorly-bedded sandstone and conglomerate was encountered throughout the depth explored, with refusal occurring at 59 feet. Bedding attitudes recorded render an overall shallow westerly dip, resulting in a laterally-supported bedding condition relative to the proposed cut slope. Hence, slope stability analyses are not warranted. However, the stabilization of the slope remains appropriate in light of the friable nature of the sandstones encountered. The W=70', D=5' keyway and 1.5:1 backcut remain applicable.

Cross Section R-R'

As with Section O-O', Boring 28 indicates that the bedding of the Saugus Formation is laterally supported relative to this cut slope, and lithologies are predominantly coarse-grained. Stabilization of the slope remains appropriate, with a key width of 60 feet, depth of 5 feet, and 1.75:1 backcut at the location of R-R'.

Cross Section V-V'

The along-bedding TQs shear strength of phi = 17 degrees, C=150 psf remains applicable to this cross section. Hence, revision of the analyses is not warranted, and the W=130' D=5' keyway remains applicable.

Cross Section Y-Y'

The along-bedding TQs shear strength of phi = 17 degrees, C=150 psf remains applicable to this cross section. Hence, revision of the analyses is not warranted, and the keyway (W=40'

D=5') remains applicable.

Cross Section B1-B1' Rapid Drawdown

Based on the data from surrounding borings, the Saugus Formation dips shallowly to the west rendering a laterally supported bedding condition for this south-facing slope. Due to its height and basin, this section was evaluated for the rapid drawdown condition with circular failure surfaces. Factors of safety of 2.3 (static) and 1.59 (pseudostatic) were obtained (See Plates B1.1-B1.4 and B1p.1-B1p.4).

Cross Section B2-B2' Rapid Drawdown

A stability fill (W=80', D=5') is recommended for this cut slope in order to remove the southerly-dipping bedrock indicated by Boring 26. Boring 25 and surrounding data indicate that the Saugus Formation within the backcut and ascending natural slope is westerly-dipping. Factors of safety of 1.89 (static) and 1.32 (pseudostatic) were obtained for this profile and the rapid drawdown condition (See Plates B2.1-B2.4, B2p.1-B2p.4 of Appendix B).

Cross Section B3-B3' Rapid Drawdown

Since the bedding of the Saugus Formation dips shallowly into this section (based on B23), this slope was evaluated with rotational failure surfaces. A stability fill key width of 100 feet and depth of 5 feet is recommended (as an intermediate key width between Section D-D' and the portion of slope further east to remain as cut. A rapid drawdown condition was considered and factors of safety of 1.94 (static) and 1.34 (pseudostatic) were obtained (see Plates B3.1-B3.4, B3p.1-B3p.4).

Cross Section B4-B4' Rapid Drawdown

Boring 15 indicates that the Mint Canyon Formation dips shallowly to the west in the vicinity of Cross Section B4-B4'. This boring encountered an entirely coarse-grained

stratigraphy (as did other borings in the Mint Canyon Fm. on this ridge). Thus, the along-bedding shear strength of phi = 25 deg., C=100 psf was applied to a dip range of 4 to 8 degrees. A static factor of safety of 1.6 was obtained for this natural slope.

Cross Section B5-B5' Rapid Drawdown

This cut slope is anticipated to encounter daylighted bedding of both the Saugus and Mint Canyon formations. Coarse-grained lithologies are anticipated based on the findings from B11, B15, and B20. Critical geometries were found to pass primarily through the Mint Canyon Formation and through the heel of the keyway. A 40 feet wide, 5 feet deep keyway provides for a static factor of safety of 2.0. The 2:1 backcut yields a temporary factor of safety of 1.61.

Cross Section B6-B6' Rapid Drawdown

This section was evaluated in consideration of the daylighted bedding condition of both the Saugus and Mint Canyon Formations and their coarse-grained stratigraphy. Failure geometries through the Mint Canyon were found to be the most critical. A dip range of 5 to 10 degrees was utilized for the Saugus Formation, while the steeper dip range of 10 to 15 degrees was utilized for the Mint Canyon Formation. The lower key width of 50 feet and upper key width of 40 feet (and depths of 5 feet) were found to yield satisfactory factors of safety for static (factor of safety = 1.59) and pseudostatic (factor of safety = 1.11 with Spencer's Method) conditions.

The composite backcut yields a temporary factor of safety of 1.43 (see Plates B6b.1-B6b.3)

Cross Section B7-B7' Rapid Drawdown

This section was evaluated with the same 5 to 12 degrees daylighted bedding condition as H-H', and the coarse-grained along-bedding strength based on B13 and B22. A 60 feet wide, 5

feet deep keyway and 2:1 backcut provide for a static factor of 1.67 (see Plate B7.1-B7.3). The 2:1 backcut yields a temporary factor of safety of 1.55 (See Plates B7b.1-B7b.3).

Soils Engineering Item #2

The landslide denoted as Qls-10 was explored by Leighton & Associates with Boring BCW-3 which encountered landslide debris to a depth of 25 feet. We recommend the removal and recompaction of this landslide in its entirety in order to mitigate its influence on the proposed Whites Canyon Road. As noted by Leighton & Associates on p. 13 of their April 19, 2004 report, Qls-10 should be mitigated by removal of landslide debris and constructing of buttress fills when plans for future development south of the proposed Farrell Road are developed. Hence, this work may be implemented by Shapell-Monteverde prior to the grading of T.T.M. 060922.

Soils Engineering Item #3

The grading required for the removal and recompaction of Landslide L1 has been added to the Tentative Tract Map.

In the case of L17, it is located within an area of planned fill, with a daylight fill extending above its head to the easterly ridgeline. The creation of this daylight fill and the mitigation of L17 will require off-site grading.

Landslide L23 is scheduled for complete removal and recompaction. The Tentative Tract Map should be modified to include a graded slope across the anticipated limits of this removal.

Landslide Qls-10a was explored by boring BCW-2 which encountered landslide debris to a depth of 35 feet. This landslide should be removed and recompacted in its entirety, with any affected portions of the planned cut slope provided with a stability fill keyway (Min. W=20', D=3'). Backdrains and/or subdrains should be installed in the removal. As in the cases of Qls-

9a and Qls-10, landslide Qls-10a may be removed under future Shapell-Monteverde plans as discussed by Leighton & Associates (2004).

Soils Engineering Item #4

Cross Sections AA-AA', BB-BB', and CC-CC' were prepared in the down-dip direction (south-westerly) through the entirety of the site to address this comment. Analyses were performed first with Janbu's Method, followed by Spencer's Method for a more rigorous treatment of inter-slice forces. The Spencer's Method output also lists the shear strengths utilized along segments, thus allowing review of which material strength/type was encountered along the segments of the most critical geometry.

Cross Section AA-AA'

Data along the profile of AA-AA' indicates that the Saugus Formation has dips generally ranging from 5 to 10 degrees, while the Mint Canyon dips at steeper inclinations, in the range of 20 to 30 degrees. Review of the profile relative to these dips indicates that the only the Saugus Formation (and its basal contact) might yield daylighted bedding conditions. Search blocks were defined to evaluate such conditions.

The weak parallel to bedding shear strengths were applied to the Saugus and Mint Canyon Formations since boring data along the section is lacking to dispel the presence of such weak beds. The most critical failure geometries were found to nearly parallel the TQs/Tmc contact, and pass through planned fills (were encountered). A Spencer's factor of safety of 3.99 was obtained (See Plates AAs.1-AAs.6). Pseudostatic analyses were not performed since the Saugus Formation dips at inclinations of less than 12 degrees.

Cross Section BB-BB'

Based on the available data, the Saugus Formation generally dips between 4 to 9 degrees

along this section, with the exception of the western-most portion of the section, where attitudes from outcrop indicate a northwesterly dip. This yields a very flat to neutral apparent dip relative to the cross section. This portion of the Saugus Formation was modeled as isotropic (between x=0 and x=1730', soil unit type #5). Critical failure surfaces were generally found to toe-out near this zone, yielding a minimum Spencer's factor of safety of 2.86 (see Plates BBs.1-BBs.5).

Circular failure surfaces were also evaluated since the westerly end of the section presents a relatively tall fill slope above a descending natural slope. Factors of safety of 2.6 (static) and 1.75 (pseudostatic) were obtained (see Plates BBc.1-BBc.6, BBcp.1-BBcp.6).

Cross Section CC-CC'

This cross section passes through several of the deep borings performed at the site which document the lack of continuity of fine-grained beds within the Saugus and Mint Canyon Formations. Specifically, borings B2, B3, B4, B7, and B8 penetrated the formational contact, and document a lack of fine-grained beds. In fact, the base of the Saugus Formation is clearly conglomeratic as documented in these borings.

Due to this documented stratigraphy, the higher parallel to bedding strengths were utilized for the Saugus (phi = 17 deg., C=150 psf) and Mint Canyon Formations (phi = 25 deg., C=100 psf) for this section. The most critical failure surfaces were found to occur in the westerly portion of the section, and yielded a minimum Spencer's factor of safety of 2.12 (see Plates CCs.1-CCs.6).

Soils Engineering Item #5

Our recommendation for the incorporation of a small, descending 2:1 fill slope for daylight fill lots is one means of protecting lots from potential surficial instability of ascending natural slopes. Alternatives such as impact walls may also achieve adequate levels of protection.

The depiction of a five feet high fill slope is barely visible at the Tentative Tract Map scale of 1"=200'. In light of this, we consider the depiction of this element on the Tentative Tract Map itself as unnecessary. However, this recommendation is clearly shown on our enclosed Removal Map (Plate 1.3) and shall be implemented at the grading plan stage (i.e. 1"=40' scale), where fill slopes or impact walls can be more readily designed and depicted.

Soils Engineering Item #6

The following items are presented on the Removal Map, Plate 1.3:

- Approximate limits and depths of removal for landslides, alluvium, and other unsuitable soils,
- Buttress and stability fill keyways (including for C-C' and O-O'),
- Restricted Use Areas for landslides or portions thereof (including L9, L21 and L22),
- All other recommended mitigation measures such as subdrains and fill caps.

CLOSURE

Based upon tests conducted as outlined in this and applicable referenced reports, and if constructed in accordance with our recommendations and properly maintained, it is the opinion of the undersigned, a duly registered professional engineer and engineering geologist, that (1) the proposed structure(s) will be safe against hazard from landslide, settlement or slippage, and that (2) the proposed building or grading construction will have no adverse effect on the geologic stability of property outside the building site. The nature and extent of tests conducted for purposes of this declaration are, in the opinion of the undersigned, in conformance with generally accepted practices in this area. Test findings and statements of professional opinion do not constitute a guarantee or warranty, express or implied.

This geotechnical report has been prepared in accordance with generally accepted engineering practices at this time and location. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

Thank you for this opportunity to be of service. Please do not hesitate to call if you have any questions regarding this report.

Respectfully submitted,
GEOLABS-WESTLAKE VILLAGE

David Sarkisian
C.E.G. 2183

Ronald Z. Shmerling
C.E.G. 1047
R.C.E. 35444

Enclosures:

Geologic Map	Plate 1.2 (in pocket)
Removal Map	Plate 1.3 (in pocket)
Cross Sections	Plate 2.1- 2.15
Boring Logs by GWV	Plates B28.1, B28.2, B29.1, B29.2, B29.3
Test Pit Logs	Plates TP17-TP23
Review Sheet	Appendix A
Slope Stability Analyses	Appendix B
Exploratory Logs by Leighton & Assoc.	Appendix C
Shear Test Diagrams	Appendix D
References	Plate R.1-R.2

XC: (4) Addressee
(1) Addressee, Attention Mr. Jim Bizzelle
(2) Sikand Engineers, Attention Mark Sikand
(2) LA County, Land Development
(1) Impact Science, Attention Ken Koch

GEOLABS-WESTLAKE VILLAGE
Foundation and Soils Engineering, Geology
31119 Via Colinas, Suite 502 • Westlake Village, CA 91362
Voice: (818) 889-2562 (805) 495-2197
Fax: (818) 889-2995 (805) 379-2603
a dba of
R & R Services
Corporation

January 3, 2005
W.O. 8838

Pardee Homes
26650 The Old Road, Suite 110
Valencia, California 91381

Attention: Mr. Wade Lewis

SUBJECT: Response to LACDPW Review Sheets dated October 12 and 15, 2004
Tentative Tract No. 060922, Skyline Ranch, Santa Clarita Area,
County of Los Angeles, California

Mr. Lewis:

We present herein our response to comments raised in the LACDPW Geologic and Soils Engineering Review Sheets dated October 12 and 15, 2004 for the subject property. Copies of these review sheets are provided in Appendix A for your reference.

Geologic Item #1 – Use of Latest Tentative Tract Map

The latest Tentative Tract Map layout has been obtained from Sikand Engineering and is utilized as the base for our enclosed Geologic Map (see Plate 1.2) and Removal Map (see Plate 1.3). Changes to the Tentative Tract Map include: minor revision to lot lines, a reduction of residential lot count from 1341 to 1251, and increase in minimum lot size from 4,830 sqft. to 5,775 sqft. The reduction in residential lot count also resulted in the creation of small lot-sized parks (Lots 1255 to 1259) and the increase in size of the Lot 1253 park site. Minor modifications to the street layouts/circulation were also made in the area of the Lot 1253 park site.

No major slope or grading revisions were made to warrant revising cross sections, or slope stability analyses.

Soils Engineering Item #1 – Use of Latest Tentative Tract Map

As noted above, the enclosed maps utilize the latest Tentative Tract Map (scale 1"=200') prepared by Sikand Engineering. In order to conform as closely as possible with the Tentative Tract Map submittal, we have "unfrozen" the 5 foot contours on the attached maps. These contours were previously left off of our maps such that the geologic and geotechnical information could be readily visible.

Soils Engineering Item #2

a) Illustration of Restricted Use Areas

Restricted Use Areas have been illustrated for Landslides L9, L21, and L22 (or portions thereof within tract boundary) on the enclosed Geologic and Removal Maps. It should be noted that the limits of Tentative Tract Map No. 060922 extend to the north, well beyond the limits of proposed development. In keeping with the LACDPW requirements, we have mapped known landslides in that portion of the site and placed them in Restricted Use Areas. That northern area and those landslides and corresponding Restricted Use Areas are presented on Plate 1.4 at a scale of 1"=600'.

b) Depiction of Recommended Mitigation Measures

Mitigation measures such as limits of removal, depths of removal, keyways, backcut gradients, fill caps, and proposed subdrains are illustrated on the Removal Map, Plate 1.3.

111 STATEMENT

Based upon tests conducted as outlined in this and applicable referenced reports, and if constructed in accordance with our recommendations and properly maintained, it is the opinion of the undersigned, a duly registered professional engineer and engineering geologist, that (1) the proposed structure(s) will be safe against hazard from landslide, settlement or slippage, and that (2)

the proposed building or grading construction will have no adverse effect on the geologic stability of property outside the building site. The nature and extent of tests conducted for purposes of this declaration are, in the opinion of the undersigned, in conformance with generally accepted practices in this area. Test findings and statements of professional opinion do not constitute a guarantee or warranty, express or implied.

CLOSURE

This geotechnical report has been prepared in accordance with generally accepted engineering practices at this time and location. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

Thank you for this opportunity to be of service. Please do not hesitate to call if you have any questions regarding this report.

Respectfully submitted,
GEOLABS-WESTLAKE VILLAGE

David Sarkisian
C.E.G. 2183

Ronald Z. Shmerling
C.E.G. 1047
R.C.E. 35444

Enclosures:
- Geologic Map ..... Plate 1.2 (in pocket)
- Removal Map ..... Plate 1.3 (in pocket)
- Restricted Use Area Map for TTM 060922 .... Plates 1.4 (in pocket)
- Review Sheets ..... Appendix A
- References ..... Plate R.1 & R.2

XC: (3) Addressee
(1) Pardee-Valencia, Attention Jim Bizzelle
(2) Sikand Engineers, Attention Mark Sikand
(2) County of Los Angeles, Land Development
(1) PCR Services, Attention Stephanie Eyestone-Jones
233 Wilshire Blvd., Suite 130
Santa Monica, CA 90401

Copies of Maps on file with the County of Los Angeles, Department of Public Works, Land Development

Strike and Dip:

Bedding

Joint or fracture

Shear or fault

Geologic Contact (dashed where approx., dotted where covered)

Fault (dashed where approx., dotted where covered)

Line of Cross Section

Buttress or Stability Fill Keyway with dimensions

MAJOR LAND DIVISION

ENTATIVE TRACT NO. 060922

THE UNINCORPORATED TERRITORY OF

OF LOS ANGELES, STATE OF CALIFORNIA

kandLog

Geolabs – Westlake Village

GEOLOGY AND SOIL ENGINEERING

DATE 1/3/05 BY DS

SCALE 1"=200' W.O. 8838

PLATE 1.2

X:\slkand\5097-019\13\Planning\Tentative Map\Dwg\TM 060922-55.dwg TM SHT 2 12/22/04 15:2

with dimensions

Proposed subdrain and cut-off wa

Proposed swale/fill slope at daylight of fill lots

Restricted Use Area

MAJOR LAND DIVISION

NG TENTATIVE TRACT NO. 060922

ED IN THE UNINCORPORATED TERRITORY OF

UNTY OF LOS ANGELES, STATE OF CALIFORN

Y:

SikandLogging

Geolabs - Westlake Vill

GEOLOGY AND SOIL ENGINEER

DATE 1/3/05 BY DS

SCALE 1"=200' W.O. 8838

PLATE 1.3

/ILSHIRE BLVD., SUITE 130
A MONICA, CA 90401
451-4488

ENGINEER:

IN FOUST ASSOCIATES
NORTH TUSTIN AVENUE
A ANA, CA 92705
667-0496

D PERMITTING

N LUKOS ASSOCIATES
RCHARD
FOREST, CA 92630-8300
837-0404

Geolabs - Westlake Village
GEOLOGY AND SOIL ENGINEERING

DATE 1/3/05 BY DS
SCALE 1"=600' W.O. 8838

PLATE 1.4

MAJOR LAND DIVISION
G TENTATIVE TRACT NO. 060922
) IN THE UNINCORPORATED TERRITORY OF
TY OF LOS ANGELES, STATE OF CALIFORNIA

kandLogo.jpg

APPENDIX A

LACDPW REVIEW SHEETS DATED OCTOBER 12 & 15, 2004 FOR TENTATIVE TRACT NO. 060922, SKYLINE RANCH

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 60922
SUBDIVIDER Pardee Homes
ENGINEER Sikand
GEOLOGIST & SOILS ENGINEER Geolabs – Westlake Village

TENTATIVE MAP DATED 3/9/04 (Tentative)
LOCATION Santa Clarita
REPORT DATE 8/23/04, 3/6/04

The Regional Planning Commission, developer, and engineer are advised that:

PRIOR TO RECOMMENDING APPROVAL OF THE TENTATIVE TRACT OR PARCEL MAP:

1. Provide a geotechnical map that uses the latest version of the tentative map as a base.
2. The Soils Engineering review dated 10/15/04 is attached.

RECEIVED OCT 2 2 2004

NOTE: Provide a copy of this review sheet with your resubmittal.

NOTE Provide a copy of this review with your resubmittal

Prepared by Geir R. Mathisen Reviewed by Charles T. Nestle Date 10/12/04

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 8.2
Job Number GMTR
Sheet 1 of 2

Review No. 2

DISTRIBUTION:
1 Drainage
1 Grading
1 Geo/Soils Central File
District Engineer
1 Geologist
1 Soils Engineer
1 Engineer/Architect

Tentative Map (Tract) 60922
Location Santa Clarita
Developer/Owner Pardee Homes
Engineer/Architect Sikand
Soils Engineer Geolabs - Westlake Village
Geologist Same as above

Review of:

Tentative Map (Tract) Dated By Regional Planning 3/09/04
Soil Engineering and Geologic Report Dated **8/23/04,** 3/06/04

Previous review sheet dated 6/15/04

ACTION:

Tentative Map feasibility is not recommended for approval.

REMARKS:

1. Requirements of the Geology Section are attached. The topography and/or grading shown on the geotechnical map and the latest tentative map must conform.

2. Show the following on the geotechnical map:
   a. Location of "Restricted Use Area(s)". Per the soils engineer, portions of landslides L9, L21, and L22 shall be placed in "Restricted Use Area(s)".
   b. All recommended mitigation measures.

3. Include a copy of this review sheet with your response.

NOTE(S) TO THE PLAN CHECKER/BUILDING AND SAFETY ENGINEER:
A. THE ON-SITE SOILS ARE SEVERELY CORROSIVE TO FERROUS METALS.
B. THE ON-SITE SOILS HAVE A MEDIUM EXPANSION POTENTIAL.
C. OFF-SITE GRADING IS RECOMMENED FOR THE REMOVAL AND RECOMPACTION OF LANDSLIDES QLS-9A, QLS-10, QLS-10A, L1, AND L17.

REGISTERED PROFESSIONAL ENGINEER
GAN N. LEM
NO. 2328
EXP. 6/30/07
GEOTECHNICAL
STATE OF CALIFORNIA

Prepared by Yoshiya Morisaku Reviewed by Gan Lem Date 10/15/04
Yoshiya Morisaku

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\60922TentTa

REFERENCES

CDMG, 1998; Seismic Hazard Evaluation Report of the Mint Canyon 7.5-Minute Quadrangle, Los Angeles County, California, OFR-98-09

..., 1998; Official Map of Seismic Hazards Zones, Mint Canyon 7.5 Min. Quadrangle, Los Angeles County, California

Dibblee, T.W. Jr., 1996; Geologic Map of the Mint Canyon Quadrangle, Los Angeles County, California, Scale 1:24,000

Geolabs-Westlake Village, October 17, 1995; Geotechnical Overview, Property Northwest of Sierra Highway and Soledad Canyon Road, County of Los Angeles

..., June 19, 2001; Second Party Review of Geotechnical Conditions and Reports, Tract 46626, North of Canyon Crest Drive, City of Santa Clarita, California

..., March 6, 2004; Geotechnical Investigation of Vesting Tentative Tract Map No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

..., August 23, 2004; Response to LACDPW Review Sheets Dated May 25 and June 15 ,2004 for Tentative Tract Map No. 60922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

GeoSoils, Inc., June 30, 1999; Final Compaction Report, Lots 1 through 138, Tract 46626, Santa Clarita, California

..., April 17, 2002; Offsite Grading, North Rear of Lot 28, Tract 46626, Canyon Country, City of Santa Clarita, California

..., February 9, 1999; Progress Report, Tract 46626, Lots 1 through 138, City of Santa Clarita, California

..., October 31, 1996; Memo-Field Exploration of Landslide and Water Tank Site, Vesting Tentative Tract 46626, Canyon Country, City of Santa Clarita, California

..., February 5, 1999; Construction Memo-False Cut/Back Cut Failure, Tract 46626, Canyon Country, City of Santa Clarita, California

..., March 18, 1997; Summary of Removals and Buttress Sizing, 138 Lot Portion of Vesting Tentative Tract 46626, Canyon Country, City of Santa Clarita, California

Geotechnical Associates, February 4, 1997; Final Rough Grading Compaction Test Report, Plum Canyon/Whites Canyon Road Alignment, 7.5.464., Tentative Tract No. 46018, Saugus Area of Los Angeles County, CA

LACDPW, May 5 and June 15, 2004; Geologic and Soils Engineering Review Sheets for Tent. Tr. Map 060922, Santa Clarita Area, County of Los Angeles, California Plate R.1

..., October 12 and 15, 2004; Geologic and Soils Engineering Review Sheets for Tent. Tr. Map 060922, Santa Clarita Area, County of Los Angeles, California

Larson, R.A., and Buckley, C.I., 1990; Geology and Engineering Geology of the Western Soledad Basin, Los Angeles County, California, Southern California Section of the Association of Engineering Geologists, 1990 Annual Field Trip Guidebook.

Leighton and Associates, October 11, 1999; Supplemental Geotechnical Investigation and Geotechnical Review of the 100-Scale Bulk Grading Plan, Tr. 46018, Plum Canyon, Saugus, California

..., April 19, 2004; Geotechnical Review of the 40-Scale Rough Grading Plan, Tracts 46018-10 and 46018-11, and Associated Fill Disposal Site, Plum Canyon Area, Saugus, County of Los Angeles, California

Munger Map Book, 1994; California-Alaska Oil and Gas Fields

Pacific Soils Engineering, Inc., May 6, 1992; Response to LACDPW Geologic and Geotechnical Engineering Review Sheets of the Supplemental Geologic/Geotechnical Investigation and Preliminary Grading Plan Review, Tracts 44967, 49433, and 49434 of Tentative Tract 44967, Mystery Mesa Project, County of Los Angeles, California

..., October 18, 1993; Grading Plan Review, Tract 49433 (Unit of Tentative Tract No. 44967), Including Summary of Geologic/Geotechnical Investigations, Mystery Mesa Project, County of Los Angeles, California

Saul, R.B., and Wooton, T.M., 1983, Geology of the south half of the Mint Canyon Quadrangle, Los Angeles County, California, CDMG Open File Report 83-24LA, Map Scale 1:9,600

Yerkes, R.F.(compiler), 1996; Preliminary Geologic Map of the Mint Canyon 7.5 Minute Quadrangle, Southern California, U.S. Geological Survey Open File Report 96-89, Scale 1:24,000

AERIAL PHOTOGRAPHS

Flight C-300, 1928, Frames F9, F10, F11, E243, E244, E245, Scale 1:18,000

Flight C-17727, 1952, Frames 4-72, 4-73, 4-74, Scale 1:14,400

Flight TG-7600, 1976, Frames 21-3, 21-4, 21-5, Scale 1:24,000

Flight 94-028, acc. 04684, 1994, Frames 106, 107, 108, 1:32,500

Horizon Surveys, performed for Sikand Engineering, Tr. 50846, Monarch Hills project, dated January 29, 1994, Frames 1-5, Scale 1:4800 +/-

ADDENDUM GEOTECHNICAL REPORT, TENTATIVE TRACT MAP NO. 060922, SKYLINE RANCH, SANTA CLARITA AREA, COUNTY OF LOS ANGELES, CALIFORNIA

November 16, 2006
W.O. 8838

GEOLABS-WESTLAKE VILLAGE

GEOLABS-WESTLAKE VILLAGE
Foundation and Soils Engineering, Geology
31119 Via Colinas, Suite 502 • Westlake Village, CA 91362
Voice: (818) 889-2562 (805) 495-2197
Fax: (818) 889-2995 (805) 379-2603
a dba of
R & R Services
Corporation

November 16, 2006
W.O. 8838

Pardee Homes
26650 The Old Road, Suite 110
Valencia, California 91381

Attention: Mr. Tom Mitchell

SUBJECT: Addendum Geotechnical Report,
Tentative Tract Map No. 060922, Skyline Ranch,
Santa Clarita Area, County of Los Angeles, California

Mr. Mitchell:

We present herein an addendum geotechnical report for Tentative Tract Map No. 060922 to address the changes made to the Tentative Tract Map design since the issuance of our last geotechnical report dated January 3, 2005. That report was approved in the LACDPW Geologic and Soils Engineering Review Sheets dated February 7 and 22, 2005.

Since the issuance of our January 3, 2005 report, additional field exploration and laboratory testing has been performed for the purpose of evaluating the future 40-scale grading plans. An additional forty-seven borings (B30 through B76) have been performed, the logs of which are provided in Appendix A. In addition, an additional 185 test pits (TP24-TP208) have been performed throughout the site (See Appendix B).

Based on our review of the available data and the revised Tentative Tract Map design prepared by Sikand Engineers, the development of Tentative Tract Map No. 60922 is considered feasible from a geotechnical engineering and engineering geologic perspective. Recommendations presented in our previous reports remain applicable, unless superseded herein.

MODIFICATIONS TO THE TENTATIVE TRACT MAP

Pertinent modifications to the Tentative Tract Map (since our January 3, 2005 report) consist of the following elements:

* Incorporation of new topographic base map, which is incorporated in our enclosed maps with 5-foot contour intervals;

* The water tank site formerly located in the easterly portion of the site has been moved to the northwesterly portion of the site (Lot 1321) at elevation 1962'. The former water tank site has been redesigned for residential lots.

* Cut slopes in the northwesterly corner of the site have been modified to accommodate basins and the new water tank site (See Cross Sections B, B1, B2, and C).

* Grades in the southeasterly portion of the site (vicinity of Lots 1-80) have been lowered five to ten feet for earthwork balance purposes. Minor grade changes and lot line adjustments have been made throughout the rest of the tract.

* The vertical and horizontal alignment of Skyline Ranch Road has been modified slightly in the southeasterly portion of the site, warranting revisions to Cross Sections L-L', M-M', N-N', P-P', and B6-B6'.

* A total of 1270 residential lots are proposed (Lots 1-1270). Lot 1271 is designated as a school site, Lots 1272-1278 are dedicated as parks, and Lots 1279-1306 are Open Space Lots. Debris basins are planned as Lots 1307-1320 and the Water Tank sites and Water Pump/Booster Stations are denoted as Lots 1321-1324.

* Improvements (sidewalks, medians, parkways) along Skyline Ranch Drive have been modified/enhanced.

GEOLOGIC FINDINGS

The additional exploration performed at the site and new topography has allowed for the

refinement of numerous geologic contacts, in particular that of the alluvium within the canyon bottoms. In particular, test pits within the main canyon (Whites Canyon) have verified the relatively shallow (5 to 15 feet on average) of the alluvial deposits, as well as their notably coarse-grained nature. The distribution of terrace deposits has also been reduced on the basis of test pit findings. The distribution and geologic structure of the Saugus Formation and underlying Mint Canyon Formation generally remains as previously defined in our referenced reports, albeit contacts have been updated in light of the new topography and additional geologic mapping.

Numerous borings were advanced within mapped landslides for the purpose of defining their depth of failure. A possible landslide was encountered by Boring B69 in the north-central portion of the site. The majority of this queried landslide is within an area of deep planned cut.

PROPOSED WATER TANK SITE

A new water tank site for two tanks is proposed at elevation 1962' in the northwesterly portion of the site. The westerly tank footprint will be comprised entirely of bedrock cut, however the easterly tank is underlain by a cut-fill transition. Hence the easterly tank should be anticipated to be undercut (5 to 10 feet) so that a relatively uniform depth of engineered fill is provided beneath the tank. The southerly-facing cut slope associated with this site is anticipated to be buttressed, as discussed in the slope stability section.

REVISED CROSS SECTIONS AND SLOPE STABILITY ANALYSES

Based on our review of the additional geologic data and revised Tentative Tract Map, the following cross sections warranted revision and slope stability analyses: B1-B1', B2-B2', B3-B3', B6-B6', C-C', D-D', L-L', M-M', N-N', P-P', and R-R'.

Shear strengths previously utilized in our referenced reports were assigned to the various material types. These are summarized in the following table:

Material	Cohesion (psf)	Angle of Internal Friction
Engineered Fill	200	34
Saugus Formation Across-Bedding	225	40
Saugus Formation Along-Bedding for Coarse-grained Lithologies	100	25
Saugus Formation Along-Bedding for Fine-grained Unsheared Lithologies	150	17
Saugus Formation Along Bedding for Fine-Grained Sheared Lithologies	150	11
Mint Canyon Formation Across-Bedding	200	40
Mint Canyon Formation Along-Bedding for Coarse-grained Lithologies	100	25
Mint Canyon Fm. Along-Bedding for Sheared Fine-grained Lithologies	150	12

Cross Section A-A'

Cross Section A-A' has been updated to illustrate the off-site grading and the proposed stability fills recommended by Geosoils, Inc. in their report dated June 5, 2006.

Cross Section B-B'

Borings B25 and B46 were advanced in the vicinity of this south-facing perimeter cut slope to define the geologic structure and stratigraphy to be exposed. The structural data from B25 and B46 indicate that the Saugus Formation is predominantly dipping to the southwest, with local southerly and westerly dips associated with scoured, irregular lithologic contacts. An apparent dip of 10 to 14 degrees was considered appropriate for consideration of translational failure surfaces. Review of the stratigraphy from B25, B46, and the projection of nearby B48 indicates that the coarse-grained along bedding strength (phi = 25 deg., C=100 psf) is applicable to the stratigraphy encountered in B25 and B46. Data from B48 indicates that the unsheared fine-grained along-bedding strength (phi=17 deg., C=150 psf) is applicable to its stratigraphic section to the depth of 125 feet. Stratigraphy below 125 feet in B48 was assigned the sheared

fine-grained along bedding strength (phi = 11 deg., C=150 psf) on account of the sheared claystones encountered at and below this depth.

Analyses indicated that the most critical trial failure surfaces occur within the unsheared fine-grained stratigraphy zone, below the buttress key. Failure surfaces in the sheared, fine-grained along bedding strength zone were sufficiently deep to provide factors of safety well above the required minimums. A buttress key width of 100 feet and depth of 5 feet, along with a 1.94:1 backcut were incorporated in the analyses. Factors of safety of 1.71 (static) and 1.32 (pseudostatic, Spencer's) were obtained. The 1.94:1 backcut provides for a temporary factor of safety of 1.33.

Cross Section B1-B1'

This cross section has been revised to evaluate the minor northward shift of the slope and the additional data obtained from B66. This boring encountered southwesterly-dipping Saugus Formation, which was modeled with an apparent dip range of 13 to 16 degrees. The rapid drawdown condition was also incorporated in these analyses on account of the basin. Based on the stratigraphy of B66, the sheared fine-grained along-bedding strength of the Saugus Formation was assigned to materials below 125 feet in B66. This boundary is illustrated on the cross section. The most critical failure surfaces were found to pass through this zone. A buttress key width of 100 feet and depth of 5 feet, along with a 1.9:1 backcut yielded factors of safety of 1.58 and 1.17 for static and pseudostatic conditions respectively. The 1.9:1 backcut yields a temporary factor of safety of 1.32.

Cross Section B2-B2'

Due to the southwesterly-dipping bedding identified by B48, a southeasterly cut slope was recommended by our office so as to reduce the loading relative to the south-facing slope associated with the proposed basin. In addition, the southeasterly-facing cut slope eliminates the

exposure of Lots 1248 and 1249 to potential surficial instability within a tall natural slope. Cross Section B2-B2' was drawn to capture the south-facing slope associated with the basin and an apparent dip condition relative to this slope. Review of B48 indicates that the majority of bedding attitudes yield flat apparent dips (typically 6 to 12 degrees) or are supported relative to the line of section. However, a sheared clay with a true-dip roughly parallel the line of section was observed at a depth of 125 feet. The Saugus Formation above this depth was assigned the fine-grained along bedding strength to a dip range of 6 to 12 degrees. The Saugus Formation below the top of this critical bed was assigned the sheared fine-grained along bedding strength. A buttress key width of 60 feet and depth of 5 feet was incorporated in the analysis as well as the rapid drawdown condition due to the basin. The critical failure surface was found to occur in the deeper zone and exit beyond the toe of slope. A factor of safety of 1.52 was obtained. A factor of safety of 1.48 was obtained for the backcut.

Cross Section C-C'

This cross section illustrates the new water tank site and the south-facing slopes associated with the water tank site. As discussed in our previous reports, a daylighted bedding condition exists for this southwesterly-facing cut slope based on the B16 data. The slope was reevaluated in light of the lesser total slope height. A five feet thick fill cap for the water tanks and the stabilization of the southwesterly-facing descending slope was also incorporated in the slope stability analyses. A bedding dip range of 21 to 24 degrees was assigned the sheared fine-grained along bedding shear strength (phi = 11 deg., C=150 psf) of the Saugus Fm. A buttress key width of 110 feet and depth of 5 feet, along with a 2.3:1 backcut provide for adequate factors of safety for static (F.O.S. = 1.60) and pseudostatic (F.O.S. = 1.12) conditions. The 2.3:1 backcut yields a factor of safety of 1.4 with Spencer's Method.

Cross Section C3-C3'

Boring B70 was advanced in the locality of an interior southwesterly-facing cut slope with a daylighted bedding condition. A dip range of 12 to 16 degrees was considered, along with the sheared fine-grained along bedding strength. A W=90' D=5' keyway, along with a 3:1 backcut was necessary to demonstrate adequate factors of safety (static F.O.S. = 1.7, pseudostatic F.O.S. = 1.25 with Spencer's Method). The 3:1 backcut yields a temporary factor of safety of 1.27.

Cross Section D-D'

The terraced pads illustrated in this cross section have been modified in elevation and result in a lesser slope height for the 2:1 perimeter slope. In addition, the data from B49 indicates that the Saugus Formation is generally coarse-grained and yields highly variable bedding attitudes on account of channels and cross-bedding. In general, the downhole data from B49 yields westerly to northwesterly data. Cross-cutting, and generally discontinuous clay shears with variable orientations were also recorded. Bedding data from B17 was generated from the downhole BIPS camera and yielded similarly highly variable dip directions. Consideration of an adverse dip range of 6 to 11 degrees relative to the section is a grossly conservative manner of modeling this slope. The Saugus Formation was assigned the fine-grained along-bedding strength (phi =17 deg., C=150 psf) for this dip range. A phreatic surface was also incorporated into the analysis based on the groundwater depth of 125 feet recorded in B49.

A buttress key width of 100 feet, and depth of 5 feet, along with a 2:1 backcut provides for a factor of safety of 1.56. The backcut yields a temporary factor of safety of 1.27.

Cross Sections L-L', M-M', N-N', B6-B6' and P-P'

These cross sections depict the proposed grading of Skyline Ranch Road and the large

west to southwesterly-facing cut slope along its easterly side. Numerous borings have been advanced within this slope to define the structure and stratigraphy of the Saugus and underlying Mint Canyon Formations. Both of these formations are notable coarse-grained with lithologies being dominated by conglomerates, conglomeratic sandstone, and sandstone. The Saugus Formation is interpreted to dip very shallowly to the west and southwest. The Mint Canyon Formation in this locality generally dips to the west and northwest at angles between 10 and 17 degrees. Bedding attitudes recorded from the various borings yield notable variations on account of the irregular and channelized nature of the deposits.

The vast majority of this west to southwesterly-facing slope is recommended for buttressing on account of the anticipated daylighted bedding condition. The coarse-grained along-bedding strengths for the formations were utilized in these analyses based on the boring data. Minor modifications to the buttress dimensions and backcut gradients have been made in our review of the modified grading design. The following table summarizes the factors of safety and buttress dimensions for these four cross sections.

Cross Section	Buttress Keyway Dimensions	Static F.O.S.	Pseudostatic F.O.S.
L-L'	W=70', D=5'	1.86	1.31
M-M'	W=60', D=5'	1.86	1.21
N-N'	W=80', D=5' Lower Key W=50', D=5' Upper Key	2.26	1.54
B6-B6'	W=70' D=5' Lower Key W=50', D=5' Upper Key	1.60	1.2
P-P'	W=80', D=5' Lower Key W=50', D=5' Upper Key	2.1	1.49

Cross Section R-R'

The proposed 2:1 cut slope at the south end of Cross Section R-R' was revisited due to the increase in its slope height. Factors of safety of 2.49 (static) and 1.74 (pseudostatic) were obtained in consideration of a W=40', D=5' keyway. The 1.85:1 backcut yields a factor of safety of 1.9.

At the north end of R-R', the lowering of the proposed grade results in a lesser total slope

height of the descending natural slope. As with our previous analyses, this slope was analyzed assuming that the slide debris and proposed fill at the toe are absent (this creating a taller and steeper natural slope condition). Circular trial failure searches were performed to identify the distance into the pad at which adequate factors of safety are present. This distance was found to be 40 feet at the location of R-R', which represents the worst-case condition for this natural slope. This slope setback of 40 feet is presented for Lots 80 through 86 as a preliminary slope setback.

SUMMARY

Based on our review of the available data and Tentative Tract Map design prepared by Sikand Engineers, Tentative Tract Map No. 60922 is considered feasible from a geotechnical engineering and engineering geologic perspective. Remedial grading recommendations such as keyways, alluvial and landslide removals, subdrains, and settlement monuments are illustrated on the enclosed Removal Map (Plate 1.3). Grading plans should be provided to our office for our review and comment. Design-level geotechnical recommendations shall be provided at that time.

111 STATEMENT

Based upon tests conducted as outlined in this and applicable referenced reports, and if constructed in accordance with our recommendations and properly maintained, it is the opinion of the undersigned, a duly registered professional engineer and engineering geologist, that (1) the proposed structure(s) will be safe against hazard from landslide, settlement or slippage, and that (2) the proposed building or grading construction will have no adverse effect on the geologic stability of property outside the building site. The nature and extent of tests conducted for purposes of this declaration are, in the opinion of the undersigned, in conformance with generally accepted practices in this area. Test findings and statements of professional opinion do not constitute a guarantee or

warranty, express or implied.

CLOSURE

This geotechnical report has been prepared in accordance with generally accepted engineering practices at this time and location. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

Thank you for this opportunity to be of service. Please do not hesitate to call if you have any questions regarding this report.

Respectfully submitted,
GEOLABS-WESTLAKE VILLAGE

David Sarkisian
C.E.G. 2183

Ronald Z. Shmerling
C.E.G. 1047
R.C.E. 35444

Enclosures:

Geologic Map	Plate 1.2 (in pocket)
Removal Map	Plate 1.3 (in pocket)
Cross Sections	Plates 2.1-2.7
Boring Logs	Appendix A
Test Pit Logs	Appendix B
Slope Stability Analyses	Appendix C
References	Plate R.1-R.3

XC: (1) Addressee (and 1 PDF on CD)
(1) Pardee-Valencia, Attention Jim Bizzelle
(2) Sikand Engineers, Attention Craig Young
(2) County of Los Angeles, Land Development (and 1 PDF on CD)
(2) PCR Services, Attention Jay Ziff (and 1 PDF on CD)
233 Wilshire Blvd., Suite 130
Santa Monica, CA 90401

(1) File

GEOLOGIC MAP OF VTTM O60922, SKYLINE RANCH, COUNTY OF LOSANGELES, CALIFORNIA

11/16/06

PLATE 1.2

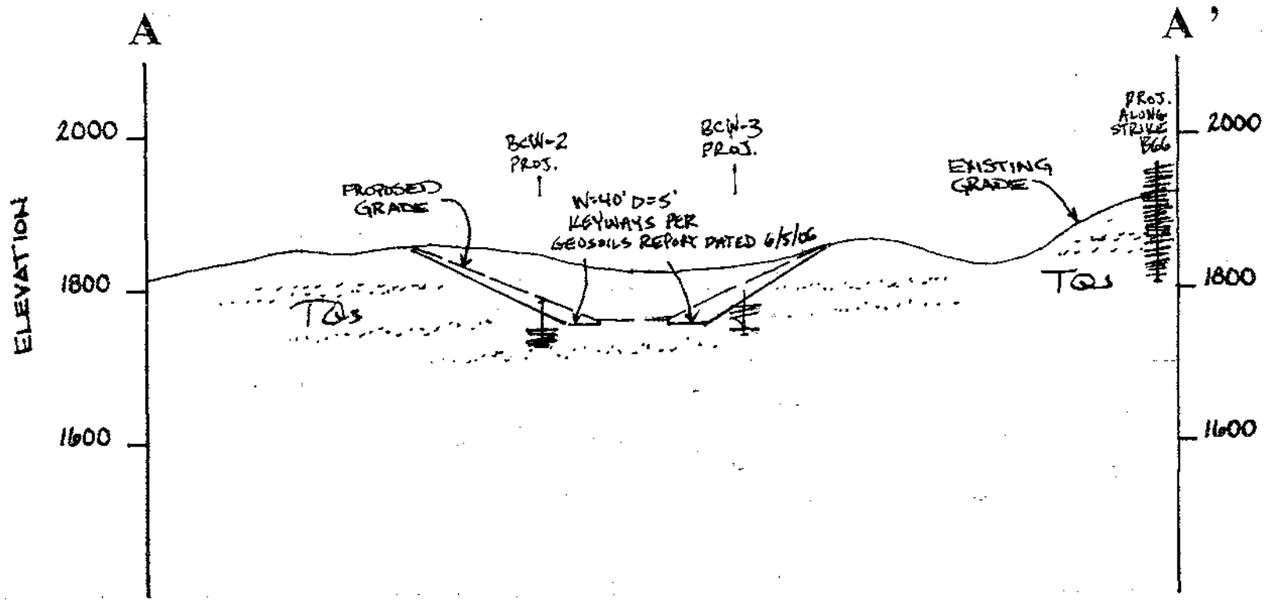
MAP ON FILE WITH THE LOS ANGELES COUNTY
DEPARTMENT OF REGIONAL PLANNING

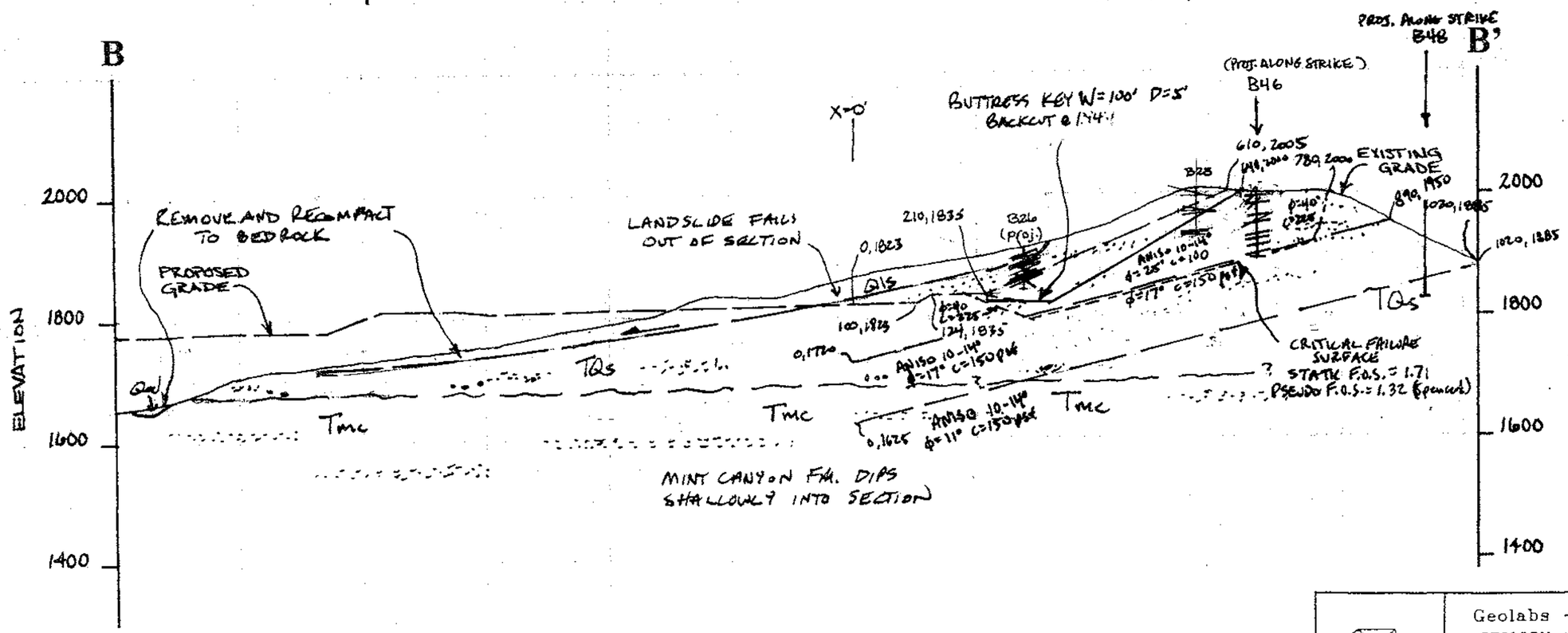
REMOVAL MAP OF VTTM O60922, SKYLINE RANCH, COUNTY OF LOSANGELES, CALIFORNIA

11/16/06

PLATE 1.3

MAP ON FILE WITH THE LOS ANGELES COUNTY
DEPARTMENT OF REGIONAL PLANNING

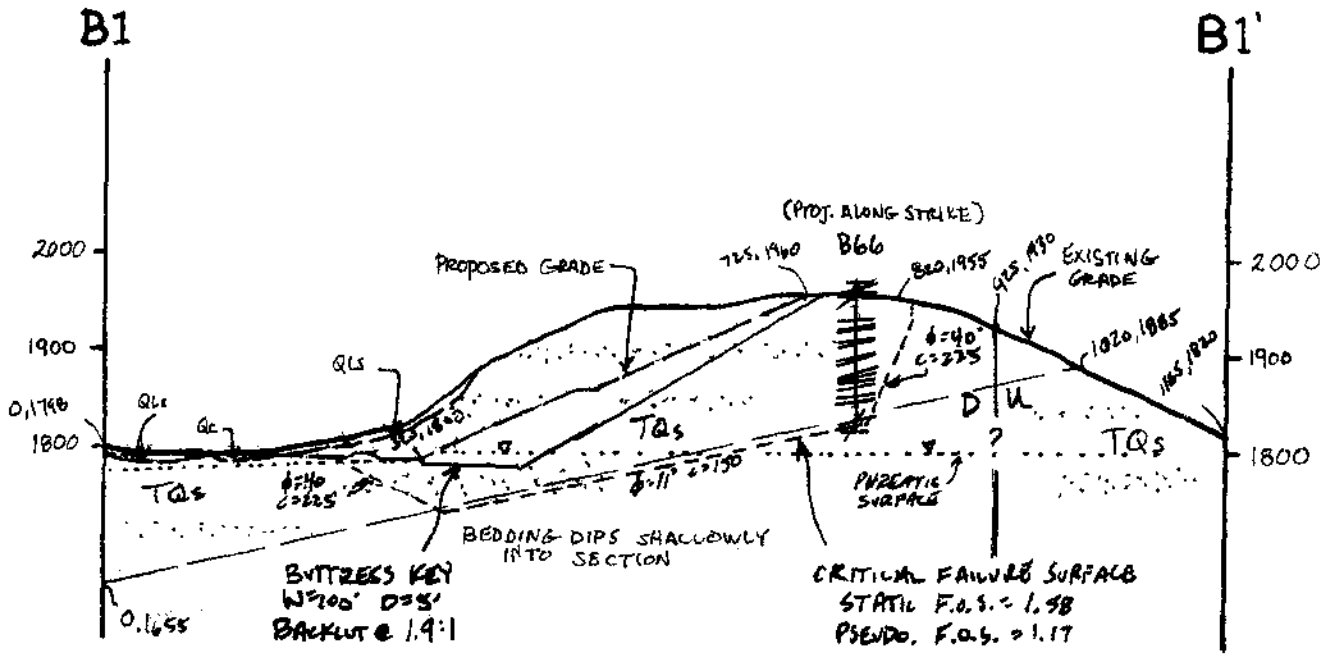


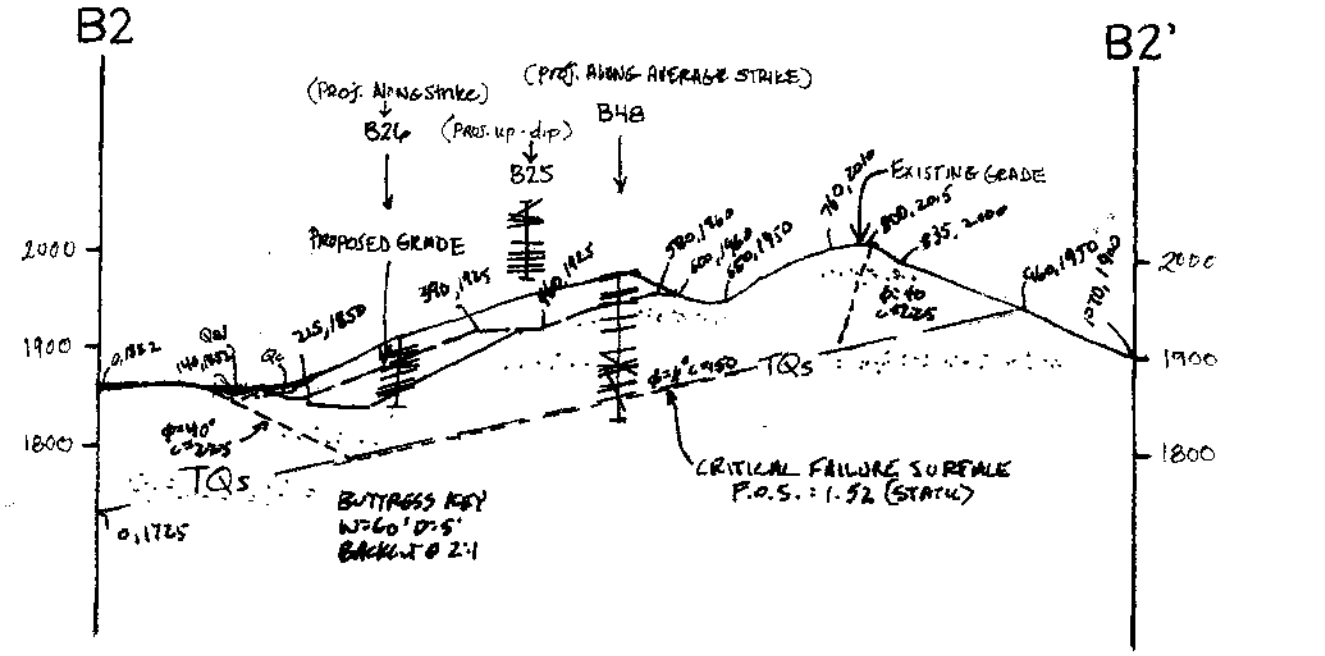


Geolabs – Westlake Village
GEOLOGY AND SOIL ENGINEERING

DATE 11/16/06 BY DS
SCALE 1"=200' W.O. 0839

PLATE 2.1





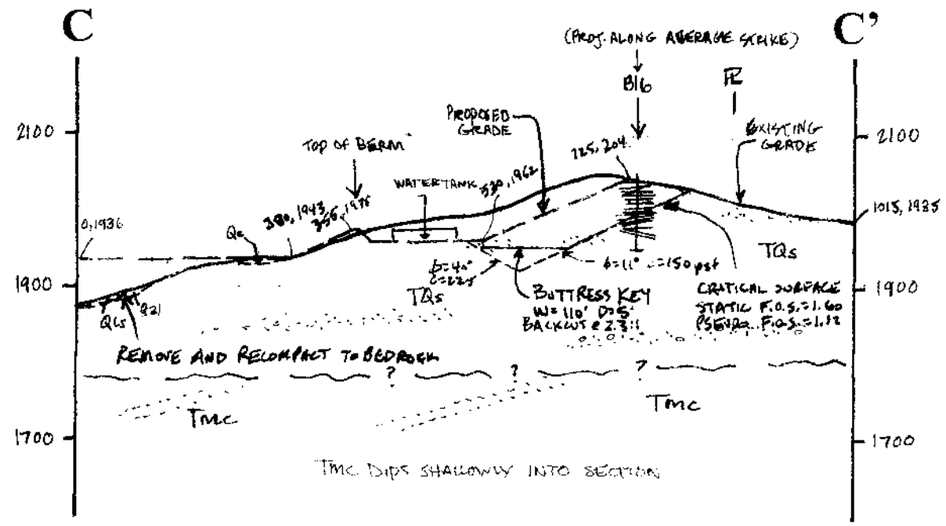
Geolabs - Westlake Village

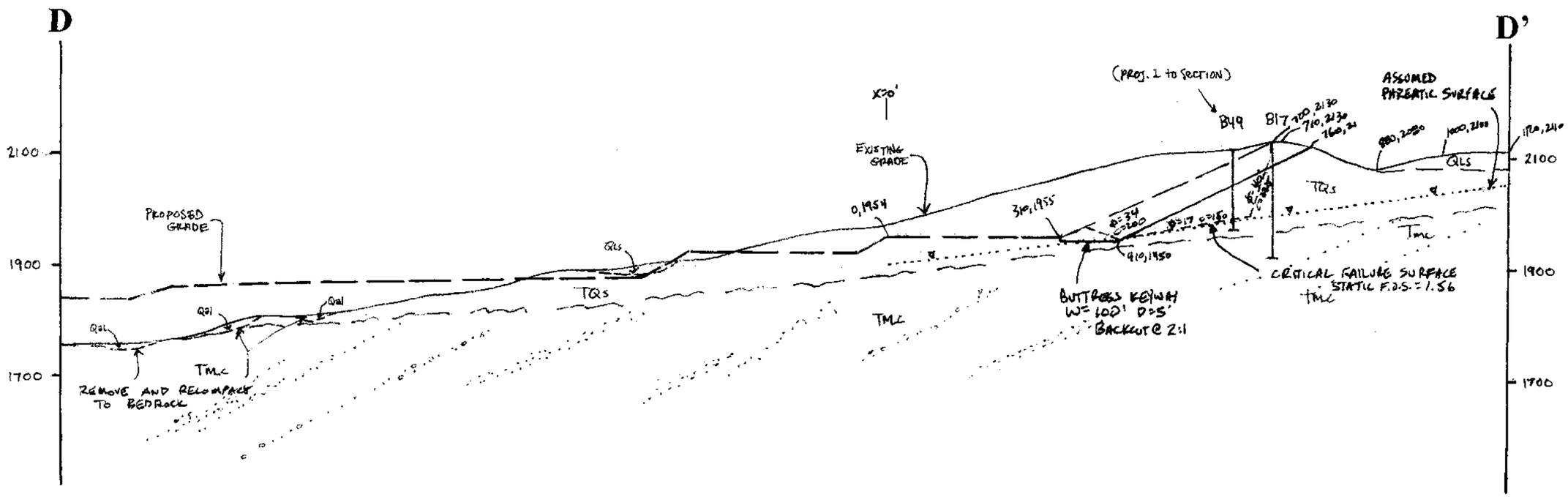
GEOLOGY AND SOIL ENGINEERING

DATE 11/16/06 BY DS

SCALE 1"=200' W.O. 9838

PLATE 2.2





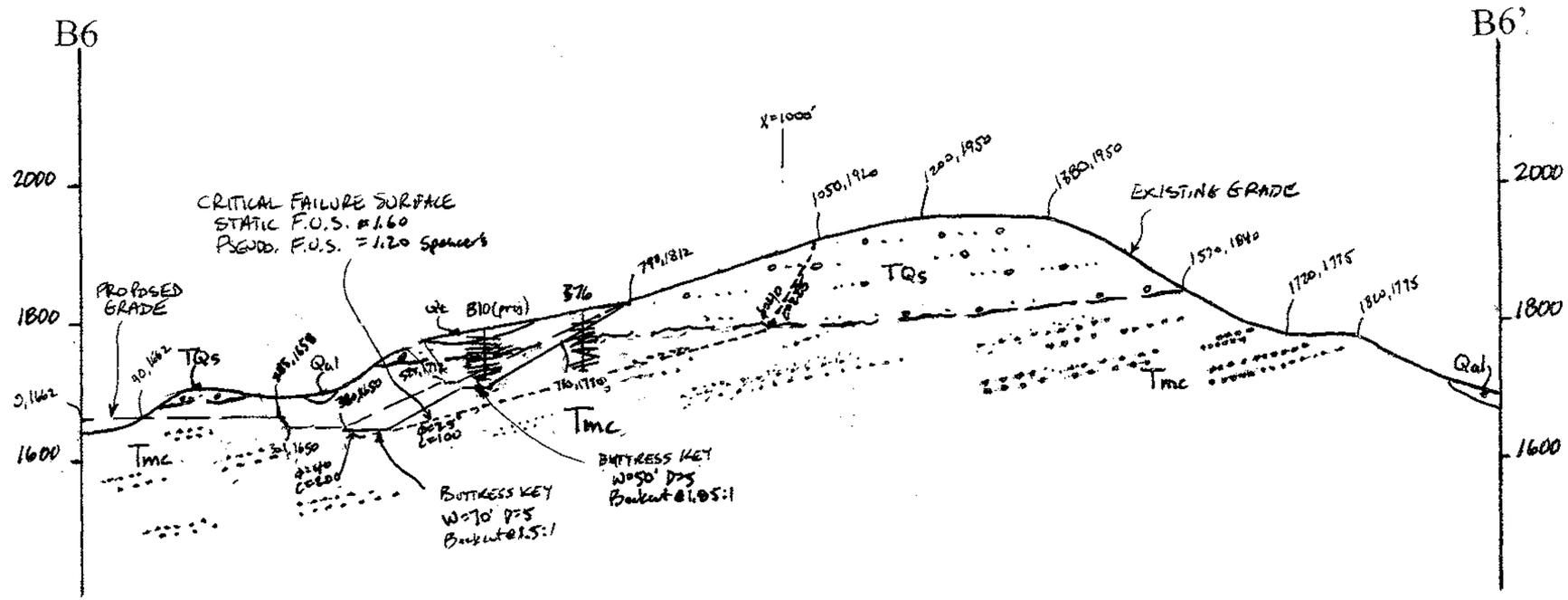
Geolabs - Westlake Village

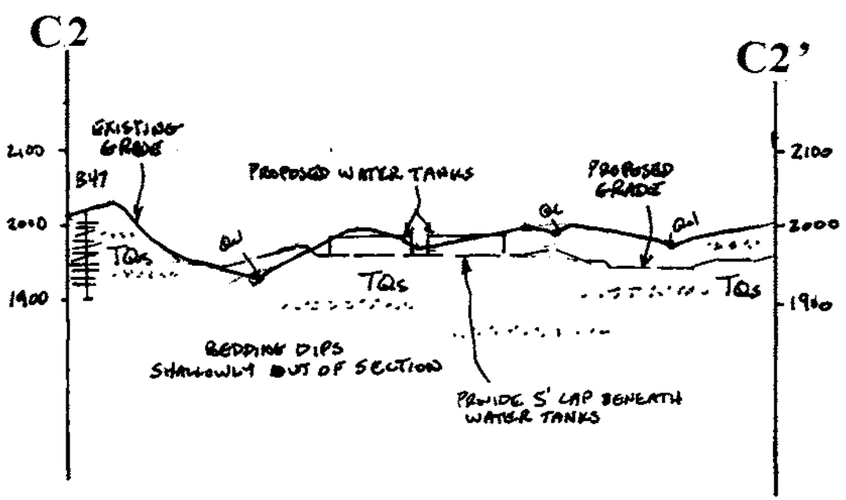
GEOLOGY AND SOIL ENGINEERING

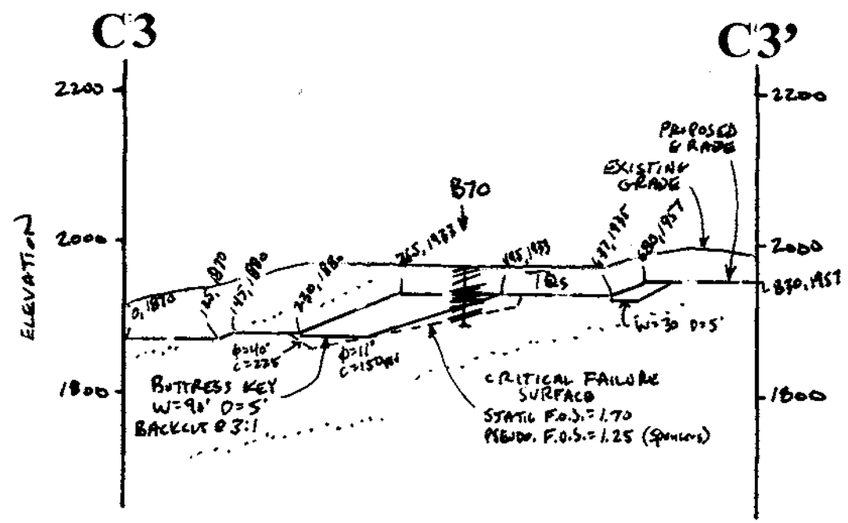
DATE 11/16/06 BY DS

SCALE 1"=200' W.O. 8838

PLATE 2.3



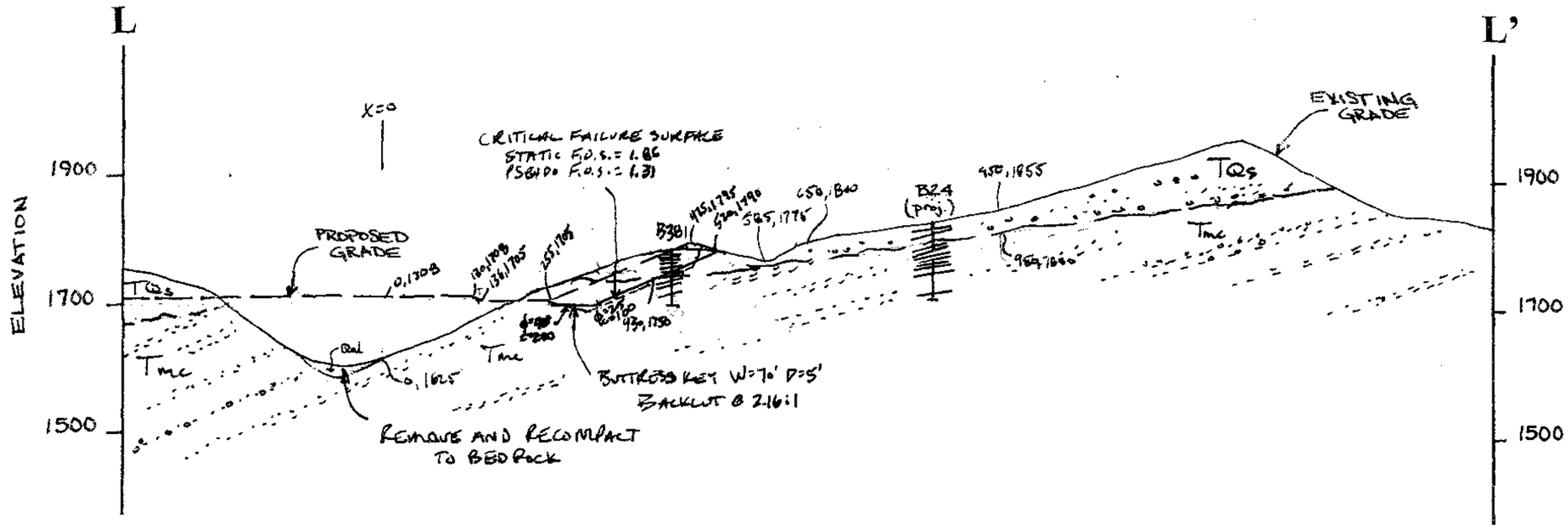


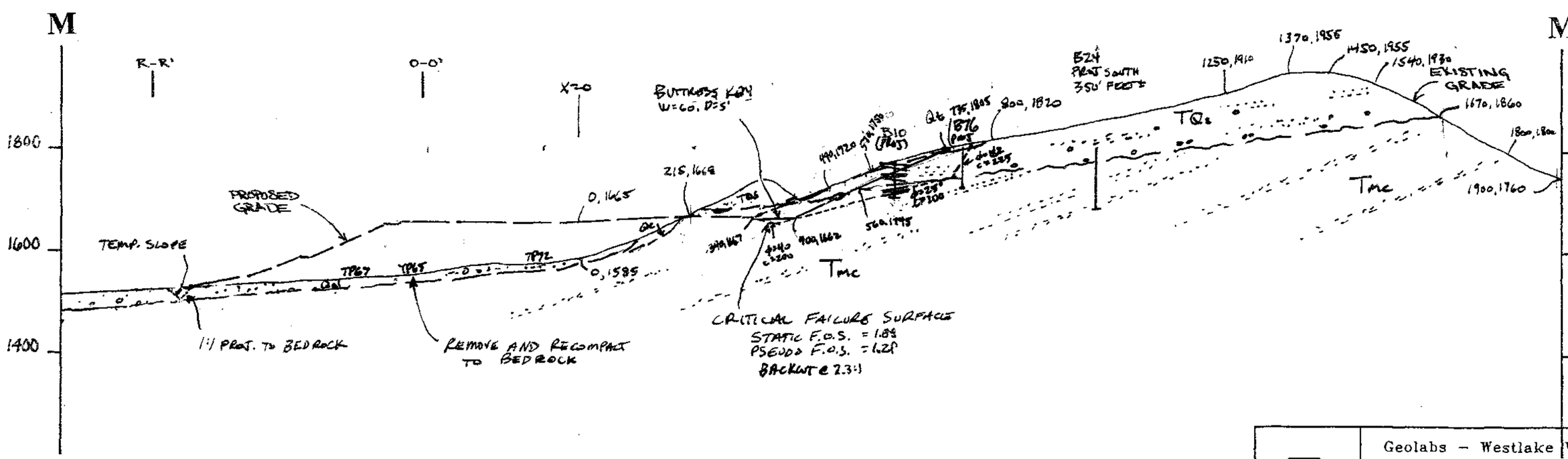


Geolabs – Westlake Village
GEOLOGY AND SOIL ENGINEERING

DATE 11/16/06 BY JS
SCALE 1"=20' W.O. 8838

PLATE 2.4

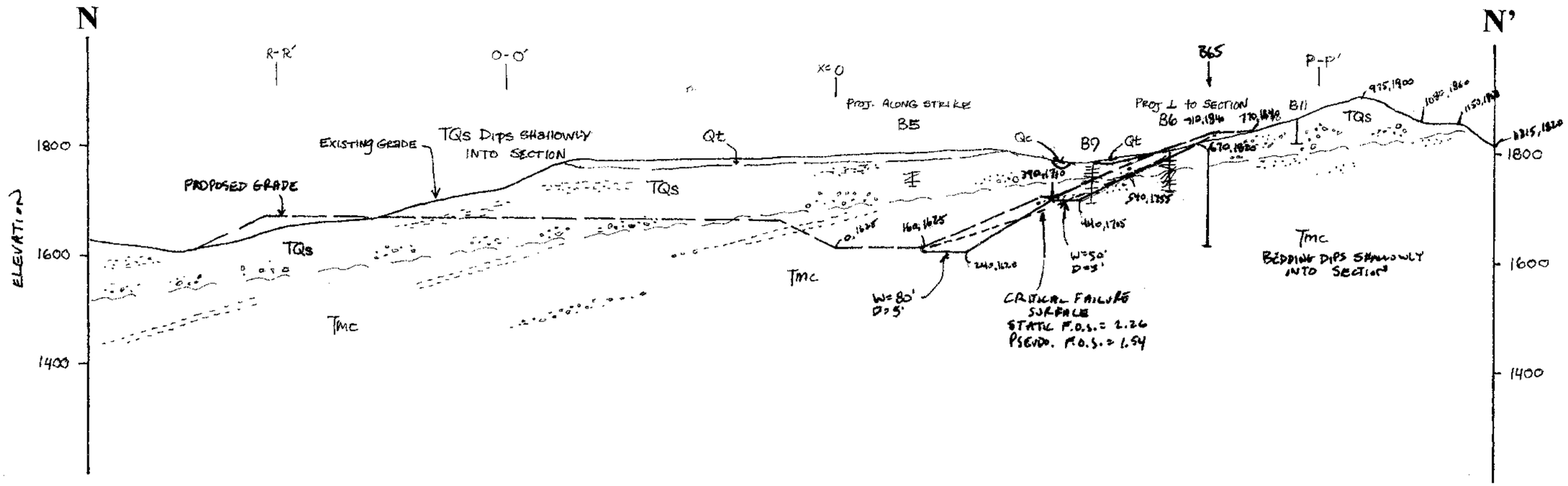


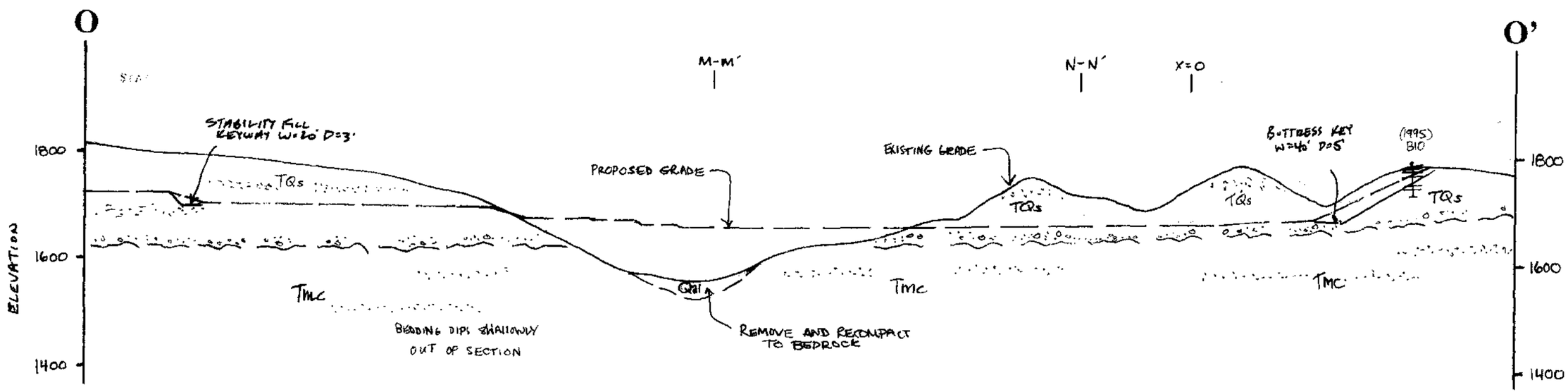


Geolabs – Westlake Village
GEOLOGY AND SOIL ENGINEERING

DATE 11/16/06 BY DS
SCALE 1" = 200' W.O. 8838

PLATE 2.5

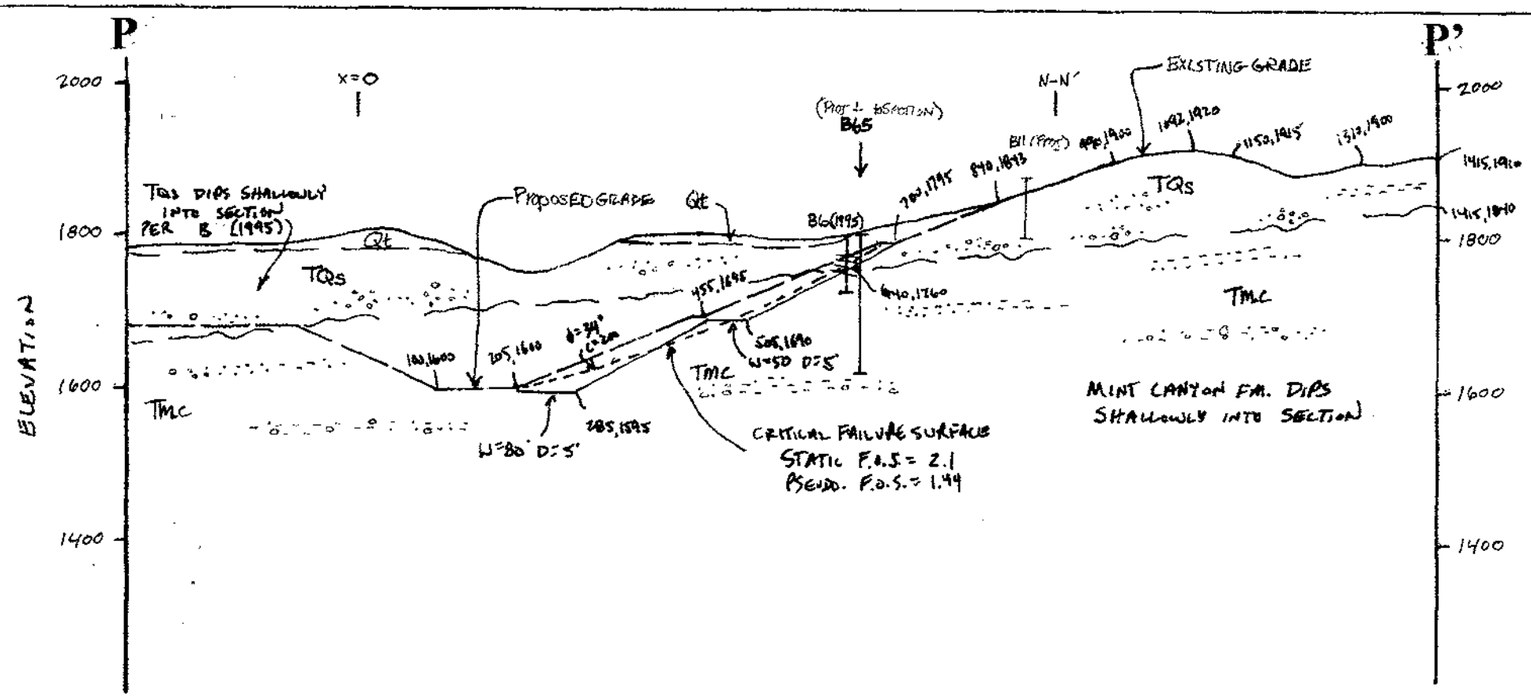


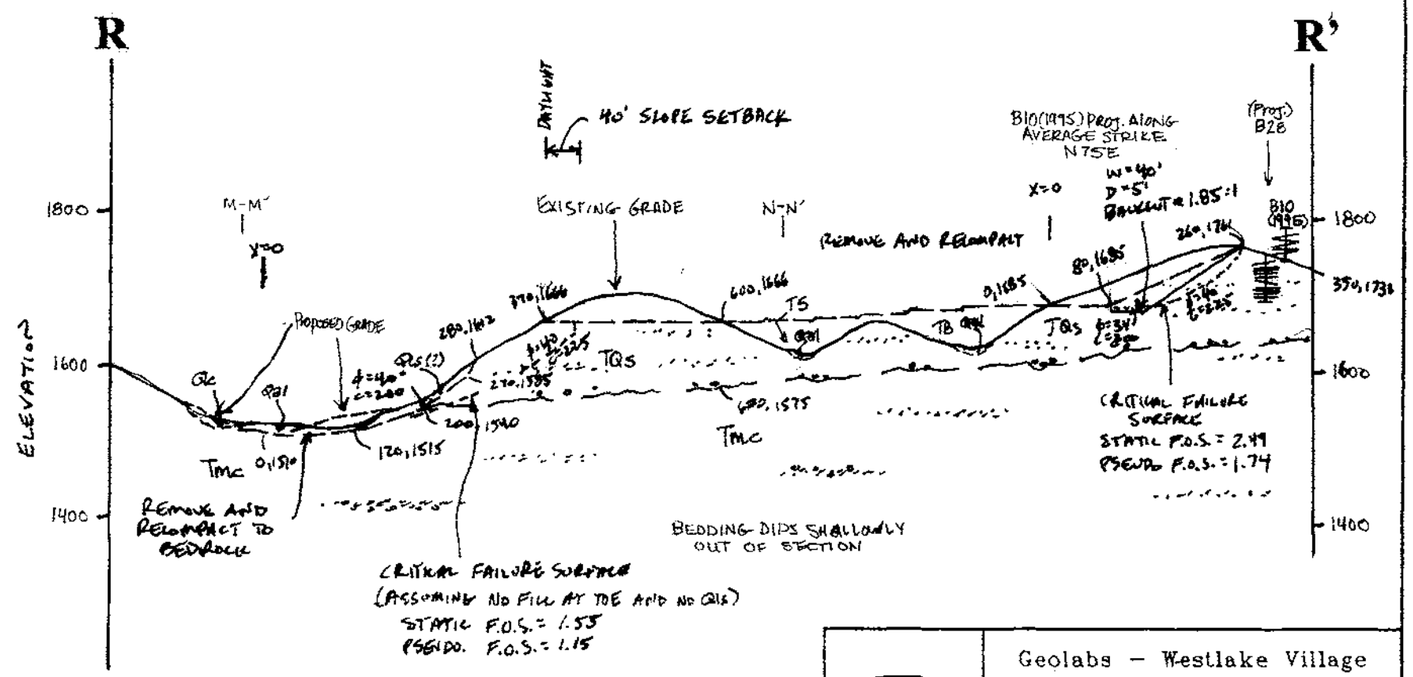


Geolabs - Westlake Village
GEOLOGY AND SOIL ENGINEERING

DATE 11/16/06 BY JN
SCALE 1"=200' W.O. 8838

PLATE 2.6





Geolabs – Westlake Village

GEOLOGY AND SOIL ENGINEERING

DATE 11/16/06 BY JW

SCALE 1"=200' W.O. 8938

PLATE 2.7

APPENDIX A

BORING LOGS
B30 THROUGH B76

TTM 060922, SKYLINE RANCH
COUNTY OF LOS ANGELES, CALIFORNIA

SUBSURFACE DATA

LOG OF BORING B30

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1518'	DATE: 3/24/06
RIG TYPE: 6" HSA	HAMMER WEIGHTS: 140 lbs.	DROP: 30"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0			X			Alluvium: Brown silty fine to coarse grained SAND with gravel and cobbles, abundant roothairs, loose, moist.	
			X				
			X				
			X				
5	17/22/19	C		2.2	125.0	Light gray gravelly SAND, medium dense, dry.	
10	15/50-6"	C				Tan to light gray sandy GRAVEL, friable, dry (no sample recovered).	
15	50-3"	C				Tan to light gray sandy GRAVEL, friable, dry (no sample recovered).	
20	50-5"	C				Tan to light gray sandy GRAVEL, friable, dry (no sample recovered).	
25	8/13/26	C		5.6	121.9	Olive to tan gravelly fine to coarse grained SAND, friable, medium dense, moist.	
30						Refusal on boulder Total Depth - 30' No groundwater No caving	
35							
40							
45							

ADDITIONAL COMMENTS:

Blows per 6" unless otherwise noted
C = California Sampler

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1518'	DATE: 3/24/06
RIG TYPE: 6" HSA	HAMMER WEIGHTS: 140 lbs.	DROP: 30"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Alluvium: Brown silty fine to coarse grained SAND with gravel and cobbles, very dense at surface, but loose at 6" below surface, moist.	
5	12/21/32	C		3.2	116.7	Tan silty gravelly fine to coarse grained SAND, friable, loose, moist.	
						@7' - Drilling through cobbles.	
10	50-5"	C		--	--	Tan gravelly fine to coarse grained SAND, friable, dry (no sample recovered).	
15	21/35/33	C		3.0	132.8	Tan gravelly fine to coarse grained SAND with cobbles, friable, dense, dry to moist.	
20	50-4"	C				Tan gravelly fine to coarse grained SAND with small cobbles, friable, dry (no sample recovered).	
25	50-0"		S			Refusal on cobble/boulder. Total Depth - 25' No groundwater No caving	
30							
35							
40							
45							

ADDITIONAL COMMENTS:

Blows per 6" unless otherwise noted
C = California Sampler
S = Standard Penetration Test

SUBSURFACE DATA

LOG OF BORING B32

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1518'	DATE: 3/24/06
RIG TYPE: 6" HSA	HAMMER WEIGHTS: 140 lbs.	DROP: 30"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Alluvium: Brownish tan gravelly SAND with cobbles, loose, dry.	
						Refusal on boulder/cobble	
						Total Depth - 3'	
5						No groundwater	
						No caving	
10							
15							
20							
25							
30							
35							
40							
45							

ADDITIONAL COMMENTS:

SUBSURFACE DATA

LOG OF BORING B33

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1518'	DATE: 3/24/06
RIG TYPE: 6" HSA	HAMMER WEIGHTS: 140 lbs.	DROP: 30"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Alluvium: Brownish tan gravelly SAND with cobbles, loose, dry.	
						Refusal on boulder/cobble	
						Total Depth - 3'	
5						No groundwater	
						No caving	
10							
15							
20							
25							
30							
35							
40							
45							

ADDITIONAL COMMENTS:

SUBSURFACE DATA

LOG OF BORING B34

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1518'	DATE: 3/24/06
RIG TYPE: 6" HSA	HAMMER WEIGHTS: 140 lbs.	DROP: 30"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Alluvium: Grayish tan fine to coarse grained SAND with gravel, loose, friable, dry.	
5							
10							
15						Increasing cobbles and gravels with depth, difficult drilling.	
20						@20' - Drill teeth broke on cobbles. Refusal. Total Depth - 20' No groundwater No caving	
25							
30							
35							
40							
45							

ADDITIONAL COMMENTS:

LOG OF BORING B35

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1518'	DATE: 3/24/06
RIG TYPE: 6" HSA	HAMMER WEIGHTS: 140 lbs.	DROP: 30"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0			X			Alluvium: Brownish tan fine to coarse grained SAND with gravel and cobbles, roothairs, loose, moist.	
			X				
			X				
			X				
			X				
5						Drilling on cobble/boulder, no sample taken.	
	38/50-3"	C		6.2	119.5	Brownish tan silty fine to coarse grained SAND with gravel, medium dense, moist.	
10	38/50-4"	C		9.8	111.2	Mint Canyon Formation: Gray gravelly fine to coarse grained SANDSTONE, friable, dense, moist.	
15	50-3"	S				Gray gravelly fine to coarse grained SANDSTONE, friable, moist (no sample recovered).	
20	50-6"	S				Gray fine to medium grained SANDSTONE with gravel, friable, very hard, moist.	
25	50-6"	S				Gray fine to medium grained SANDSTONE with gravel, hard, moist.	
30						Total Depth - 25' No groundwater No caving	
35							
40							
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = California Sampler
S = Standard Penetration Test

SUBSURFACE DATA

LOG OF BORING B36

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1518'	DATE: 3/24/06
RIG TYPE: 6" HSA	HAMMER WEIGHTS: 140 lbs.	DROP: 30"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0			X			Alluvium: Brown silty fine to coarse grained SAND with gravel and cobbles, roothairs, loose, moist.	
			X				
			X				
			X				
5	8/21/26	C		--	--	Tan gravelly fine to coarse grained SAND, loose, dry.	
						Refusal on cobble/boulder.	
						Total Depth - 8'	
10						No groundwater	
						No caving	
15							
20							
25							
30							
35							
40							
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = California Sampler

SUBSURFACE DATA

LOG OF BORING B37

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1518'	DATE: 3/24/06
RIG TYPE: 6" HSA	HAMMER WEIGHTS: 140 lbs.	DROP: 30"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Alluvium: Brown/tan silty fine to coarse grained SAND with gravel and cobbles, roothairs, loose, moist.	
5							
						@8' Cobble zone.	
10						Refusal on cobble/boulder. Total Depth - 8' No groundwater No caving	
15							
20							
25							
30							
35							
40							
45							

ADDITIONAL COMMENTS:

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1787'±	DATE: 4/21/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0			X			Colluvium: Medium brown silty SAND and abundant scattered gravel and cobbles, subrounded, occasional rootlets, damp, medium dense.	
			X				
			X				
			X				
			X			Weathered Saugus Formation: Tan to light brown silty SANDSTONE with abundant gravel and cobbles, well graded, friable, weathered, damp, dense.	
5							
							@7' Approx. BN90/17W
10	5-12"	C		9.5	115.0	Highly channelized friable SANDSTONE with gravel to weakly cemented sandy CONGLOMERATE, well graded, very dense, moist.	@10' Approx. Horizontal bedding
						Saugus Formation: Undulatory, scoured contact with cobble to boulder CONGLOMERATE with occasional zones of gravelly SANDSTONE, interbedded.	@13' Approx. Horizontal bedding
15							
						Gravel CONGLOMERATE.	@17' Approx. BN25W/5SW
20	5-12"	C		10.4	115.9	Tan medium to coarse grained SANDSTONE, slightly friable to friable, dense, moist.	@20' Approx. BN23W/8SW
						@20' - Cobble CONGLOMERATE.	
						@22' - Medium to coarse grained SANDSTONE with abundant gravel, friable, well graded.	@23' Approx. Horizontal bedding
25						@25.5' - Gravelly SANDSTONE with occasional subrounded cobbles, well graded.	
							@27' Approx. Channel N68E/6NW
30	14-12"	C	X	4.3	111.5	Tan coarse grained SANDSTONE with scattered gravels, moist, friable.	
			X			@31.5' - Fine to coarse gravel CONGLOMERATE, matrix supported, slightly friable to friable, matrix is well graded silty SAND.	
			X				
			X				
			X				
35						Tan coarse gravel CONGLOMERATE, matrix supported, slightly friable to friable with occasional interbeds of well graded SANDSTONE, massive, very dense, moist.	
						Discontinuous sand lens.	@39' Approx. BN3E/55SE
40	12-12"	C		10.3	104.5		
						Silty very fine to medium grained SANDSTONE, friable.	
						Slightly undulatory contact.	@42' Approx. Horizontal bedding
						Light brown silty very well graded SANDSTONE with scattered fine to coarse gravel.	
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5,619 lbs.
31 - 60', 3,745 lbs.
61 - 90', 2,280 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1787'±	DATE: 4/21/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
45						@47.5' - Tan fine to coarse grained SANDSTONE with scattered gravel, friable, very dense.	@48' Approx. BN26E/4NW
50	15-12"	C		2.9	122.3		
						Buff fine to very coarse grained SANDSTONE with scattered gravel, well graded.	@52' Approx. BN26E/5NW
55						Cobble to boulder CONGLOMERATE, matrix supported, well graded, sand and gravel matrix. @56.5' - Medium to coarse grained SANDSTONE with gravel interbeds.	@57' B N26E/8NW
60						Tan to light brown to orangish brown sandy CONGLOMERATE with gravel to cobble clasts, matrix supported, friable, moist, very dense.	
	20-10"	C	X	5.7	122.2		
65						Mint Canyon Formation: Highly scoured undulatory contact, light gray gravel CONGLOMERATE, moderately cemented, hard, moist. @66.5' - Base of CONGLOMERATE, cemented zone (approx. 6" thick) with scattered cobbles. @67' - Light gray fine to medium grained SANDSTONE, poorly graded, moderately cemented, hard, moist.	@64' Approx. Contact Horizontal @66.5' Approx. Contact N20E/24NW
70	11-5" 18-8"	C C		6.2	115.3	Light gray gravelly SANDSTONE with occasional brown siltstone ripup clasts (clasts up to 12" diameter), friable, moist, very dense.	
75						@74.5' - Massively bedded light gray fine to medium grained SANDSTONE, poorly graded, moderately cemented, hard, moist.	@74.5' Approx. BN14W/18SW
80	15-12"	C	X	15.5	116.8	Well graded fine to coarse gravel CONGLOMERATE. Black silty very fine grained SANDSTONE (3-4" thick), continuous around boring. @80.5' - Light gray silty very fine to fine grained SANDSTONE, moist, very dense. @83' - Light gray gravelly CONGLOMERATE.	@80' B N28W/17SW
85							

ADDITIONAL COMMENTS:

Total Depth - 90'
No groundwater
Minor caving at 7'
Backfilled

C = Modified California Sampler
Kelly Bar Weight) - 30', 5,619 lbs.
31 - 60', 3,745 lbs.
61 - 90', 2,280 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1780'±	DATE: 4/25/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0			X			Artificial Fill: Reddish brown clayey silty fine to coarse grained SAND with gravel, moist, medium dense, trash.	
			X				
			X			@1' - Terrace Deposit: Orangish brown fine to coarse grained SAND with gravel and cobbles, dry to slightly damp.	
5							
						Saugus Formation: Undulatory contact to brown silty medium to coarse grained SANDSTONE with gravel, very dense, moist.	@6' Approx. Horizontal bedding
						@7' - Brown fine grained SANDSTONE with occasional gravel, massive, very dense, moist.	
10						@9' - Brown fine to coarse grained SANDSTONE with occasional cobbles, friable, very dense, fining upwards, moist.	
	5-12"	C		12.1	112.0		
						Brown fine to medium grained SANDSTONE with occasional gravel, thickly bedded, moist, weakly cemented, very dense, moist.	@12' Approx. BN37E/23SE
15							
						Brown medium to coarse grained SANDSTONE with fine gravel and occasional cobbles, subrounded, highly channelized, friable, very dense, moist.	@17' Approx. BN45W/9NE
20	8-11"	C		1.3	121.6	@19.5' - Coarse sand stringer (approx. 4" thick).	@19.5' Approx. BN14W/6SW
						Brown fine to coarse grained sandy gravel and cobble CONGLOMERATE, friable, very dense, moist.	
25							
						3" thick fine to medium grained SANDSTONE lens with subangular fine gravel.	@28' Approx. Horizontal bedding
30	11-10"	C	X	1.5	117.7	@29' - Brown fine to medium grained SANDSTONE, friable, well graded, very dense, moist.	
						@30.5' - Channelized interbedded medium to coarse grained SANDSTONE with fine gravel to occasional cobbles, interbeds 2-4" zones of fine to medium grained SANDSTONE.	@33.5' Approx. BN51E/19NW
35						@33.5' - Undulatory channelized contact between medium to coarse grained gravelly SANDSTONE and fine to medium grained SANDSTONE, contact is discontinuous around boring.	
40	19-12"	C		4.1	116.8	Undulatory contact with brown fine grained SANDSTONE, friable, very dense with occasional cobbles and occasional zones of discontinuous silty fine grained SANDSTONE, fining upwards, moist.	@40' Approx. Horizontal contact
45							

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5,619 lbs.
31 - 60', 3,745 lbs.
61 - 90', 2,280 lbs.
91 - 120', 1,223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1780'±	DATE: 4/25/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						Brown cobble CONGLOMERATE with silty sand matrix, matrix supported.	
						@44.5' - Brown medium to coarse grained SANDSTONE and CONGLOMERATE, interbedded, undulatory, pinched contact.	
45						Massively bedded fine to medium grained SANDSTONE, poorly graded, friable.	
50	15-10"	C	X	9.1	109.7	Undulatory contact to brown cobble CONGLOMERATE, fine to medium sand matrix with occasional discontinuous pockets of clayey SANDSTONE, highly channelized, friable.	@50' Approx. Contact N88E/14SE
						@51' - 3" thick clayey discontinuous SANDSTONE, grading into fine to medium grained SANDSTONE with occasional cobble and boulder CONGLOMERATE.	@51' B N50W/21SW
55							
						@58.5' - Slightly irregular contact to brown fine grained SANDSTONE, friable.	@58.5' Approx. BN24W/17SW
60						@60.5' - Channeled fine grained gravel to cobble CONGLOMERATE, subrounded to subangular (fine clasts are more angular) friable fine to coarse sand matrix, beds are 2-4" thick.	@62' Approx. Channel contact N34W/20-33SW
	20-9"	C	X	8.0	111.7	@64.5' - Cobble CONGLOMERATE, well graded, matrix supported to fine gravel to cobble CONGLOMERATE, occasional thick clast supported beds, well graded, friable channels dipping to NW and NE.	@64.5' B N60E/17NW
65			X				
			X				
70	21-6"	C		1.9	113.8		
						@71' Thin bedded fine gravel CONGLOMERATE, friable, sand matrix and thinly bedded fine gravel to cobble CONGLOMERATE, well graded, friable, sand matrix.	@71' B N30E/11NW
						@73' - Occasional cobble to boulder CONGLOMERATE.	
75						@74' - Fine grained gravel to cobble CONGLOMERATE with occasional subrounded boulders.	@75' B N80E/19NW
						@78' Fine gravel CONGLOMERATE to fine grained gravelly coarse grained SANDSTONE, friable.	
80	20-5"	C		2.4	113.2	Channelized interbedded medium to coarse grained SANDSTONE, friable, damp.	@80' Approx. Channel N40E/6NW
						Occasional boulders, boring is tighter below, fine grained to cobble CONGLOMERATE, 2-4" thick, fine gravelly medium to coarse grained SANDSTONE.	
85							

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5,619 lbs.
31 - 60', 3,745 lbs.
61 - 90', 2,280 lbs.
91 - 120', 1,223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1780'±	DATE: 4/25/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
80							
85						Clayey fine grained SANDSTONE, 2" thick scoured into CONGLOMERATE above, non-plastic.	@86' B N40E/6NW
						@87' - Thin fine gravel to cobble CONGLOMERATE.	
	14-12"	C	X	27.7	95.2	1/4" thick clayey SILTSTONE.	@89' B N48W/11NE
90			X			@89.5' - 1/4" thick clayey SILTSTONE.	
						@90' - Friable coarse grained SANDSTONE, moist.	
						@91' - Fine gravel to cobble to boulder CONGLOMERATE, well graded, coarse sand matrix supported.	
						@92' - Fine gravel to cobble CONGLOMERATE, well graded, coarse sand matrix supported.	
95						@95' - Occasional boulder.	@95' Approx. Horizontal bedding
100	20-6"	C		2.6	111.4	Brown gravelly fine to coarse grained SANDSTONE, slightly damp, friable.	
							@102' Approx. Horizontal bedding
105						Brown gravel and cobble CONGLOMERATE, fine to coarse grained sandy matrix, damp, friable, well graded.	
110						Total Depth - 108' No groundwater No caving Backfilled	
115							
120							
125							

ADDITIONAL COMMENTS:

C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5,619 lbs.
31 - 60', 3,745 lbs.
61 - 90', 2,280 lbs.
91 - 120', 1,223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.001
LOCATION: Santa Clarita	ELEVATION: 1651'±	DATE: 5-8-06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Alluvium: Dark grayish brown fine to medium grained SAND with 40% subangular fine to coarse gravel clasts and 5-10% subrounded cobble to boulder clasts, medium dense, moist, roots (1/4" diameter) to brown fine to medium grained SAND, medium dense, moist.	
			X				
5						Brown fine to coarse grained SAND with 40% subangular fine to coarse gravel clasts and 5-10% subrounded cobble to boulder clasts, medium dense, moist, roots (1/4" diameter).	
10	18/ Refusal	C		10.9	117.8	Mint Canyon Formation: Scoured contact to subrounded coarse gravel CONGLOMERATE, clasts commonly fine to coarse gravel (granitic), moderately cemented, greenish gray silty fine to medium sandstone matrix, channeled, hard, moist.	@10' Contact N49W/13NE to 34NE
						@12' - Sharp contact to greenish gray silty fine to coarse grained SANDSTONE (12" thick), grading to coarse grained SANDSTONE, occasionally subrounded fine to coarse gravel, fining upward, hard, moist, moderately indurated.	@12' Contact N74E/36NW
15						@17' - Grading to subrounded coarse gravel to cobble (granitics) CONGLOMERATE, moderately cemented greenish gray silty fine to coarse grained sandstone matrix, massive, channeled, hard, moist.	
20	13/25	C		9.5	126.1	Subrounded coarse gravel to cobble CONGLOMERATE, moderately cemented greenish gray silty fine to coarse sandstone matrix, channeled, massive, hard, moist.	@20' Channel N21E/40-60NW
25							
30	15/30	C		5.0	112.8	Bedded coarse gravel to cobble CONGLOMERATE to fine grained SANDSTONE to channeled, scoured fine gravel to cobble CONGLOMERATE. Increase in subrounded coarse cobble clasts, massive.	@28' B N33E/21NW
35						Subrounded gravel to cobble CONGLOMERATE, moderately cemented greenish gray fine to coarse sandstone matrix, massive, hard, moist.	
40	30/30	C	X	11.5	127.3	4-8" diameter greenish gray SILTSTONE ripup clasts in gravel to cobble CONGLOMERATE. Grades to greenish gray silty clayey fine grained SANDSTONE with undulatory near vertical, striated shears, hard, moist, to fine grained gravel to cobble CONGLOMERATE with siltstone ripup clasts in moderately cemented greenish gray fine to coarse sandstone matrix, hard, moist.	@39.5' Contact N84E/24NW @41' Shear N20E/Vertical @41.5' B N18E/27NW
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2,280 lbs.
50 - 75', 1,220 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.001
LOCATION: Santa Clarita	ELEVATION: 1651'±	DATE: 5-8-06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						Grading to fining upward sequences of greenish gray clayey fine grained SANDSTONE to fine grained SANDSTONE (with depth), hard, moist.	@42.5' Contact N64E/13NW
							@44.5' Contact N24W/26NE
45						@44.5' - Light seep in west wall above greenish gray clayey fine grained SANDSTONE (1mm thick brown clayey fine grained SANDSTONE at contact, hard, moist, massive, grading to fine grained SANDSTONE, abundant white calcium carbonate nodules 4-8" diameter), hard, moist, massive.	
50	15/30	C		11.0	121.7	Grades to greenish gray CLAYSTONE, hard, moist, massive, steeply dipping shears.	
							@52' Shear N10E/70-85NW
						Grades to clayey silty fine grained SANDSTONE, hard, moist, massive.	
55			X				
60	50-6"	C		12.0	112.9	Continued fining upward sequences of greenish gray fine grained SANDSTONE to clayey fine grained SANDSTONE (typically 2 feet thick), hard, moist, massive.	
65						Grades to fine to coarse grained SANDSTONE, occasional subrounded boulder, hard, moist, massive, to fine to coarse grained gravel CONGLOMERATE, moderately cemented greenish gray fine to coarse sandstone matrix, hard, moist.	
70						Total Depth - 70' Light seep in W wall at 44.5' and seep below 70' No caving Backfilled	
75							
80							
85							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2,280 lbs.
50 - 75', 1,220 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1754'±	DATE: 5/10/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Colluvium: Light brown fine to coarse grained SAND with gravel and cobbles, subrounded clasts, friable, loose, dry.	
						Saugus Formation: Light brown fine to coarse grained SANDSTONE with gravel, interbedded with gravel stringers, beds approximately 1/4" to 1/2" thick, friable, cross-bedded, highly channelized.	
5						@7.5' - Medium to coarse grained SANDSTONE with gravel, dense, moist.	
10	15/16			2.1	126.0	Fine sand lens approximately 2" thick.	@11' Channel BN49W/9NE
						@11' - Light brown fine to coarse grained SANDSTONE with gravel, interbedded gravel stringers, highly channelized, friable, moist, very dense.	
15							
						Light brown cobble and boulder CONGLOMERATE, matrix supported, sand matrix.	
20						Light brown interbedded fine to coarse grained SANDSTONE and gravel CONGLOMERATE, 1" and 12" thick beds, highly channelized, slightly friable to weakly cemented, moist, hard.	@21' Channel BN39E/9SE
25							
							@27' Channel BN38W/25NE
30							
						Light brown boulder and cobble CONGLOMERATE, matrix supported, boring belled to approximately 5' diameter, corkscrewing down.	
35							
40							
						No downlogging below 43' because boring is excessively wide and unsafe to log.	
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2,280 lbs.
50 - 75', 1,200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1754'±	DATE: 5/10/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
45						Light brown fine to coarse grained SANDSTONE with subangular gravel and subrounded cobbles, friable, moist, hard.	
50							
55						Light brown fine to coarse grained SANDSTONE with subangular gravel subrounded cobbles, friable, moist, hard.	
60							
						Refusal on boulder.	
65							
70						Total Depth - 63' No groundwater No caving Backfilled	
75							
80							
85							

ADDITIONAL COMMENTS:

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 2160'±	DATE: 5/15/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Colluvium: Brown clayey silty SAND with gravel, cobbles, and boulders, medium dense, moist.	
						Mint Canyon Formation: Tan SANDSTONE with gravel, cobbles, and boulders, moist.	
5							
10	15-6"	C		3.2	132.8	Tan fine to medium grained SANDSTONE with fine to coarse gravel, friable, dry (30-40% coarse gravel).	
15							
						Refusal on boulder at 17'	
20							
25							
30							
35							
40							
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2,280 lbs.
50 - 75', 1,200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 2160'±	DATE: 5/15/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Colluvium: Brown clayey silty SAND with gravel, cobbles, and boulders, medium dense, moist. Mint Canyon Formation: Tan CONGLOMERATE, friable sandstone matrix, dry.	
5							
						Subrounded to subangular coarse gravel to boulder CONGLOMERATE, well graded, weakly cemented fine to coarse grained SANDSTONE matrix, bedded, hard, moist, clasts are granitic, quarzitic, volcanic (5-10% boulder size).	@7' B N55W/22NE
10						@10' - Slightly friable matrix.	@11' B N20W/20NE
						Occasional 2-12" thick subangular fine to coarse grained gravel CONGLOMERATE in fine to coarse grained sandstone matrix, slightly friable, hard, moist.	
15						@24' - 18-30" boulder in hard, moist, slightly friable fine to coarse grained SANDSTONE, belling to 3' diameter, SW-SE dipping channels (20-30°), unsafe to downhole below 25'.	@15' B N85E/18SE
20	4/10	C		4.9	110.4		@19' Channel BN-S/26SE to N30W/25SW @21' B N30W/19NE
25							
30	6/13	C		6.3	116.0	Tan SANDSTONE with fine cobbles and angular gravel (approximately 60% coarse clasts), cobbles are subangular, finer clasts are more angular, well graded, friable, moist.	
35							
40	6/15	C				Cobble in shoe, no sample recovered, tan SANDSTONE with gravel to cobble clasts, clasts are subrounded, smaller clasts are subangular, moist, friable.	
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2,280 lbs.
50 - 75', 1,200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 2160'±	DATE: 5/15/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
45							
50	6/17	C		5.9	126.5	Tan gravelly fine to coarse grained SANDSTONE, gravel is subrounded (approximately 25% gravel), moist, friable.	
55							
60	18/26	C		6.6	110.8	Tan gravelly fine to coarse grained SANDSTONE, subangular clasts (approximately 20% gravel), moist, friable. Frequent boulders.	
65							
						Refusal on boulders.	
70							
75						Total Depth - 68' No groundwater No caving Backfilled	
80							
85							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2,280 lbs.
50 - 75', 1,200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 2115'±	DATE: 5/18/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Colluvium: Brown silty clayey gravelly SAND with cobbles, moist, medium dense.	
						@1' - Mint Canyon Formation: Tan cobble CONGLOMERATE, gravel and sand matrix, matrix supported, friable, moist (approximately 15% cobbles, 45% sand, 40% gravel), cobbles are subrounded, coarse	
5						sands and gravel are subangular	
						Drilling on cobbles and boulders, drilling is very difficult.	@8' Approx.
						@8' - Boulder to cobble CONGLOMERATE, clasts mostly grano-diorite,	BN17E/15NW
10	3/5	C		8.0	105.0	approximately 10% boulders, clast supported.	
						Subangular boulder CONGLOMERATE, boulders up to 2' diameter, clast supported, approximately 60% boulders, gravel and fine to medium sand matrix.	
15			X				
						Boulder to cobble CONGLOMERATE (10% boulders, 40% cobbles, 25% sand, 25% gravel), subangular to subrounded clasts, fine to medium sand and gravel matrix.	
20							
	23-10"	C		11.6	--	@22.5' - Moderately cemented fine to medium grained SANDSTONE, discontinuous around hole, hard, dry.	@23' Approx.
						@23' - Cobble CONGLOMERATE with occasional boulder (less than	BN36W/11SW
25						5%), subrounded to subangular cobbles, clast supported.	
						Boulder and cobble CONGLOMERATE, boulders up to 2' diameter,	
30	6/10	C		7.3	93.9	clast supported (40% boulders, 20% cobbles).	
35						Refusal at 34' on boulders No groundwater No caving Backfilled	
40							
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2,280 lbs.
50 - 75', 1,200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 2060'±	DATE: 5/26/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP:

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Mint Canyon Formation: Dark brown clayey fine grained SAND with subrounded coarse gravel to cobble, very stiff, moist, to well graded subrounded coarse gravel to boulder CONGLOMERATE with weakly cemented greenish gray fine to medium grained sandstone matrix, hard, moist.	
5							
10		C		7.0	126.4	@10' - Well graded subrounded coarse gravel to cobble CONGLOMERATE with weakly cemented greenish gray fine to medium sandstone matrix, hard, moist, to conglomeratic fine to coarse grained SANDSTONE with subrounded fine gravel to cobble, weakly cemented to slightly friable, hard, moist.	@11' B N38W/29SW
15						@13' - Crudely bedded fine gravel to subrounded cobble to boulder CONGLOMERATE, well graded, weakly cemented to slightly friable, to greenish gray fine to medium grained SANDSTONE, well graded, hard, moist (20-30% gravel/cobble, 5% boulder).	@17' B N34W/25SW
20	8/10	C		12.4	119.1	@20.5' - Scoured contact with green gray fine grained SANDSTONE, massive, moderately indurated, very hard, moist.	@20' J N76W/38SW
						@22.5' - Contact to coarse gravel to cobble CONGLOMERATE (subrounded), in weakly cemented green gray fine to medium grained sandstone matrix, well graded, hard, moist, crudely bedded.	@22.5' Contact N39W/19SW
25							
						@28' - Occasional subrounded boulders (5-10%).	@27' B N47W/20SW
	14/25	C		9.2	107.4		
30							
						@32' - Subrounded coarse gravel to cobble CONGLOMERATE with occasional boulder in weakly cemented green gray fine to medium grained sandstone matrix, well graded, hard, moist.	
35						Green gray fine to coarse grained SANDSTONE (12" thick) with occasional subangular fine gravel, weakly indurated, hard, moist.	@35' Contact N40W/18SW
						@36' - Subrounded coarse gravel to cobble CONGLOMERATE, weakly cemented, green gray fine to medium grained sandstone matrix, very hard, moist, crudely bedded, occasional boulder (≤5%).	@38.5' B N47W/23SW
40	10/20	C		10.7	107.6	@40' - Subrounded coarse gravel to cobble CONGLOMERATE, weakly cemented, green gray fine to medium grained sandstone matrix, very hard, moist, crudely bedded, occasional boulder (≤5%).	
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2,280 lbs.
50 - 75', 1,200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 2060'±	DATE: 5/26/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP:

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
45							
50	15/20	C		9.2	115.4	@50' - Interbedded fine grained SANDSTONE, laminated to thinly bedded, and gravel to cobble CONGLOMERATE in weakly to moderately cemented green gray fine to medium grained sandstone matrix, hard, moist.	
55							
60	25/45	C		8.0	109.4	@60' - Fine gravel to cobble CONGLOMERATE, slightly friable to weakly cemented, greenish gray fine to medium grained sandstone matrix, hard, moist.	
65						Total Depth - 60' No groundwater No caving Backfilled	
70							
75							
80							
85							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights:) - 50', 2,280 lbs.
50 - 75', 1,200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 2105'±	DATE: 5/30/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Colluvium: Brown cobbly and gravelly SAND, cobbles are subrounded, occasional boulders, roots, dry.	
						@4' - Mint Canyon Formation: Tan cobble to boulder CONGLOMERATE, sand and gravel matrix, matrix supported, boulders up to 2' diameter (approximately 35% boulders), well graded, dry, very dense.	
5							
10							
	12/18	C		13.1	116.4	@11' - Tan cobble to boulder CONGLOMERATE, friable sand and gravel matrix, clast supported, massive, moist, very dense.	
						@14' - Fine to medium grained SANDSTONE, friable, moist.	@14' B N39W/21SW
15						@15' - Tan cobble to gravel CONGLOMERATE, fine to medium sand matrix, matrix supported, massive.	@15' B N42W/22SW
						@19' - Channelized tan fine to medium grained SANDSTONE with	@19' B N15W/22SW
20	8/12	C		11.5	105.3	occasional coarse cobbles, well graded, moist, friable.	
						@23' - Boulder to cobble CONGLOMERATE, approximately 2' diameter boulder, clast supported, massive.	
25						@24' - Tan subangular gravel and cobble CONGLOMERATE with friable fine to medium sand matrix, matrix supported, well graded, massive, hard, moist.	
30	15/20	C		6.7	127.6	@30' - Tan subangular gravel and cobble CONGLOMERATE with friable fine to medium sand matrix, matrix supported, well graded, massive, hard, moist.	
35							
	15/25	C		5.9	124.5	@39' - 2' diameter boulder, horizontally elongated.	
40						@39.5' - Gravel and cobble CONGLOMERATE with friable fine to medium sand matrix, matrix supported, well graded, hard, moist.	
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2,280 lbs.
50 - 75', 1,200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 2105'±	DATE: 5/30/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@43' - Switch to 18" diameter digging bucket (from 24" diameter), unable to downhole log below 43', subrounded gravel to cobble CONGLOMERATE, well graded, friable sandstone matrix.	
45							
50	140-6"	C		10.7	110.0	@50' - Subrounded gravel to cobble CONGLOMERATE, friable sandstone matrix.	
55						@55' - Boulders up to 1.5' diameter in gravel to cobble CONGLOMERATE, friable sandstone matrix.	
60	50-5"	C				@60' - No sample recovered, too rocky. @61' - 1.5' diameter boulder.	
65						Total Depth - 63' refusal on boulder No groundwater No caving Backfilled	
70							
75							
80							
85							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights:) - 50', 2,280 lbs.
50 - 75', 1,200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2005'±	DATE: 6/1/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Saugus Formation: Silty fine grained SANDSTONE with clay and subrounded to subangular cobbles, roothairs to 3'.	
5						@5' - Massive silty fine grained SANDSTONE, weakly indurated, hard, moist.	
						@6' - White calcite precipitate along joint.	@6' Joint N18E/74SE
						@8' - Brown silty fine grained SANDSTONE with sparse fine gravel, discontinuous carbonate veins, massive, weakly indurated, hard, moist.	
10	7-12"	C		12.1	112.6	@10' - Brown to light brown silty fine to medium grained SANDSTONE with abundant coarse sand to fine gravel, weakly indurated, massive, hard, moist.	
15							
						@16.5' - Contact with light brown fine grained SANDSTONE and subrounded to subangular gravel CONGLOMERATE, well graded, weakly cemented, hard, moist.	@16.5' Contact N20W/11SW
						@18' - Thinly bedded to channelized, channels dip to west approximately 20°.	@18' B N14W/19SW
20	7-12"	C		16.3	111.1		@21' Contact N39W/17SW
			X			@21' - Sharp contact to light brown fine grained sandy SILTSTONE with trace clay, massive, hard, multidirectional shears.	@21.5' Shear N85E/40SE
							@22' Shears N56W/38SW
25						@25' - Gradational contact to tan medium to coarse grained SANDSTONE with gravel and occasional cobbles.	N33W/29SW Slicks: S40W
						@27' - Approximately 6" thick light brown medium to coarse grained SAND, slightly friable, interbedded with gravel to cobble CONGLOMERATE, hard, moist.	
30	15-13"	C		2.9	118.6	@30' - Light brown fine to coarse grained SANDSTONE with occasional gravel, friable, hard, moist.	
						@31' - Channelized conglomerate.	@31' Channel N40W/16SW
						@33' - Contact to tan fine to coarse grained SANDSTONE, massive, hard, moist.	@33' Contact N45W/14SW
35						@34.5' - Gradational contact to gravel CONGLOMERATE with sand matrix, angular to subrounded clasts, undulating channels dipping approximately 17-24 SW to SE.	
						@37' - Appearance of fine cobbles.	@38' B N75E/20SE
40	18-12"	C		7.0	117.3	@40' - Gradational contact to fine to coarse grained SANDSTONE with occasional gravel, friable, hard, moist.	
45							

ADDITIONAL COMMENTS:

C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5,619 lbs.
31 - 60', 3,745 lbs.
61 - 90', 2,280 lbs.
91 - 120', 1,223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2005'±	DATE: 6/1/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@44' - Sharp, slightly scoured contact with yellow brown fine grained SANDSTONE, massive, slightly friable, hard, moist.	@44' B N27E/22SE
45						@45' - Fine grained SANDSTONE with gravel, grading to gravel CONGLOMERATE with slightly friable medium to coarse sand matrix, moist.	
						@49' - Thinly bedded CONGLOMERATE.	
50	18-12"	C		5.6	125.3	@50' - Channel, scoured into yellow brown medium to coarse grained SANDSTONE with gravel and small cobbles, slightly friable, hard, moist.	@50' Channel N35E/24SE
55							
			X				
						@57' - Scoured contact with clayey fine grained SANDSTONE, hard, massive. Near vertical, pervasive shears.	@57' Channel N68E/6SE
						@59.5' - Brown fine to coarse grained SANDSTONE with gravel.	@59.5' Approx. BN52W/11SW
60	15-12"	C		15.6	119.6	@60.5' - Contact with brown fine grained sandy SILTSTONE with approximately 1/4" diameter concretions, cemented, hard, moist, discontinuous, undulatory, shallow, west dipping clay-lined shears.	
			X				
							@63' Shear N45W/26SW
65							
						@67' - Gravel cobble CONGLOMERATE with slightly friable fine to medium grained sandstone matrix.	
70	14-12"	C		7.2	118.4	@70' - Light brown gravelly SANDSTONE with occasional fine cobbles, friable, hard, moist.	@70' B N30W/12SW
							@74' B N46W/13SW
75						@75' - Grading to fine gravel CONGLOMERATE, slightly friable, hard, moist.	
						@78' - Contact to sandy SILTSTONE with occasional gravels, hard, moist.	@78' Contact N66W/11SW
80	15-12"	C		7.3	115.4		
						@81' - Scoured contact to well graded subrounded gravel to cobble CONGLOMERATE, friable yellow fine to coarse sandstone matrix, very dense, moist.	@81' Contact N80E/37SE
85							

ADDITIONAL COMMENTS:

C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5,619 lbs.
31 - 60', 3,745 lbs.
61 - 90', 2,280 lbs.
91 - 120', 1,223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2005'±	DATE: 6/1/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
80							
						@84' - Grading to gravel CONGLOMERATE with friable yellow brown fine to coarse sandstone matrix, highly channelized beds.	@84' B N25W/17SW
85							
90	30-10"	C		5.0	108.3	@90' - Boulder approximately 1' diameter, elongated horizontally in well graded, gravel to cobble CONGLOMERATE with slightly friable yellow brown sandstone matrix, massive, hard, moist.	@90' Channel N90E/14S
						@94' - Contact with friable light brown fine grained SANDSTONE, moist, hard.	@94' Channel N4W/16SW
95						@95.5' - Gradational contact to subrounded gravel to cobble CONGLOMERATE, slightly friable light brown fine to coarse sandstone matrix, highly channelized.	@95' B N36W/18SW
100	20-12"	C		7.2	116.1	@100' - Light brown fine to coarse grained SANDSTONE with gravel, hard, moist, friable.	
						@101' - Subrounded gravel to cobble CONGLOMERATE, slightly friable, fine to coarse sandstone matrix.	@101' B N32W/19SW
105							
						@109' - Abundant gravel to cobble quartz clasts, granitic clasts and schist, channelized.	
110	8-12"	C		8.5	99.9	@110' - Light brown fine to coarse grained SANDSTONE with gravel, friable, hard, moist.	@111' B N75E/15SE
						@111' - Channelized bedding.	
115						@115' - Light brown fine to coarse grained SANDSTONE with gravel, friable, hard, moist.	
120						Total Depth - 115' No groundwater No caving Backfilled	
125							

ADDITIONAL COMMENTS:

C = Modified California Sampler
Kelly Bar Weights:) - 30', 5,619 lbs.
31 - 60', 3,745 lbs.
61 - 90', 2,280 lbs.
91 - 120', 1,223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 2021'	DATE: 6/5/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Colluvium: Brown silty SAND, dry, medium dense, rootlets.	
						@3' - Saugus Formation: Light brown gravelly fine to coarse grained SANDSTONE, subangular gravel, slightly friable, rootlets to 5' depth, moist, hard.	
5						@6' - Scoured contact to light brown fine grained SANDSTONE with subangular gravel, friable, moist, hard.	
						@8' - Discontinuous light brown SILTSTONE bed, moist, hard, within light brown fine grained SANDSTONE with subangular gravel, friable, hard, moist.	
10	4-12"	C		8.2	115.4		
15							
						@18.5' - Slightly scoured contact with light brown silty fine grained SANDSTONE with occasional subangular gravel, moist, hard.	
20	9-12"	C	X	17.5	113.9	@20' - 12" thick sheared brown CLAYSTONE, waxy surface on shears, multidirectional shears, carbonate veins, moist, hard.	
						@21' - Light brown fine grained sandy SILTSTONE, moist, hard.	
25						@25' - Light brown fine grained sandy SILTSTONE with carbonate nodules, moderately cemented, carbonate nodules are 2" maximum diameter, moist, hard.	
						@26.5' - Brown CLAYSTONE, discontinuous, multidirectional shears, moist, hard.	
30	11-12"	C		19.0	111.9	@27' - Light brown fine grained sandy SILTSTONE to silty fine grained SANDSTONE, massive, moist, hard.	
						@30' - Grading into light brown fine grained SANDSTONE, massive, moist, hard.	
						@34.5' - Grading into brown CLAYSTONE, massive, moist, hard.	
35							
40	12-12"	C		16.0	113.5	@40' - Grading into light brown silty fine to medium grained SANDSTONE with subangular gravel, massive, moist, hard.	
45							

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5,619 lbs.
31 - 60', 3,745 lbs.
61 - 90', 2,280 lbs.
91 - 120', 1,200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 2021'	DATE: 6/5/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
45						@44' - Grading into subangular gravel CONGLOMERATE with friable, light brown coarse sand matrix, matrix supported, channelized, moist, hard.	
50	15-12"	C		14.5	118.5		
						@51' - Scoured contact with light brown clayey fine grained SANDSTONE, massive, with occasional gradational stringers of siltstone.	@51' Scoured Contact N46W/18NE
55							
						@56' - Grading into light brown fine to coarse grained SANDSTONE with sparse subangular gravel, friable, moist.	
60	14-12"	C		6.5	113.7	@57' - Grading into light brown gravel CONGLOMERATE with occasional cobbles, subangular gravel and cobbles, sand matrix, matrix supported, moist, hard, channelized.	@59' Approx. Contact N5E/4NW
						@59' - Sharp contact with light brown silty fine grained SANDSTONE, scoured, massive, moist, hard.	@62.5' B N25W/17SW
65						@61.5' - Grading into light brown gravel and cobble CONGLOMERATE, subangular clasts are weathered and fractured, sand matrix, matrix supported, well graded, moist, hard.	
							@68' B N60W/14SW
70	20-12"	C		10.7	116.5		
						@71' - Scoured contact into light brown fine to coarse grained SANDSTONE, friable, moist, hard.	@71' Scoured Contact N15E/19NW
75						@72' - Light brown gravelly fine to coarse grained SANDSTONE, subangular gravel, moist, hard.	
						@74' - Light brown cobble and gravel CONGLOMERATE, slightly friable, fine to coarse sand matrix, matrix supported, well graded, moist, hard.	
						@76.5' - Scoured contact with brown CLAYSTONE, pervasively sheared, claystone shears have waxy surfaces, conglomerate above scoured down to 79' on NW wall.	
80	17-12"	C		13.5	118.7	@78' - Grading into light brown silty fine grained SANDSTONE with sparse gravel, massive, moist, hard.	
85							

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5,619 lbs.
31 - 60', 3,745 lbs.
61 - 90', 2,280 lbs.
91 - 120', 1,200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 2021'	DATE: 6/5/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
80							
85							
			X			@87' - Highly plastic brown CLAY seam, no noticable shears (approximately 2" thick).	@87' Contact N58W/7SW
90	22-10"	C		11.7	122.6	@88' - Light brown clayey fine grained SANDSTONE with subangular gravel, massive, hard, moist, with 1-2" thick brown clay seams at 88.5' and 90', clay seams are very stiff, moist, no shear surfaces. surfaces.	@88.5' clay seam N55W/10SW @90' clay seam N60W/20SW
95							
						@99' - Brown discontinuous clay seam.	
100	25-10"	C		11.6	121.3	@100' - Brown clay seam. @100.5' - Grading into light brown silty fine to medium grained SANDSTONE, hard, moist. @103' - Grading into light brown fine to medium grained SANDSTONE, moist, hard.	@100' Clay seam N27W/12SW
105						@104' - Grading into light brown gravel CONGLOMERATE with fine to coarse sand matrix, matrix supported, subangular gravel, massive, hard, moist to very moist.	@106' Approx. BN85E/15SE
110	25-8"	C		6.4	116.1	@110' - Brown gravelly fine to coarse grained SANDSTONE, subangular gravel, friable, moist, hard. @113' - Fine grained gravel CONGLOMERATE with sheared olive clay (not observed downhole), only in surface cuttings.	
115							
120						Total Depth - 115' No groundwater No caving Backfilled	
125							

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5,619 lbs.
31 - 60', 3,745 lbs.
61 - 90', 2,280 lbs.
91 - 120', 1,200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1987'±	DATE: 6/7/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Colluvium: Brown clayey fine grained SAND, moist.	
						@1' - Saugus Formation: Light brown fine to coarse grained SANDSTONE, with subangular cobble and gravel, moist.	
						@3' - Light brown silty fine to medium grained SANDSTONE, hard, moist, rootlets.	@4' Contact
5						@4' - Gravel to cobble CONGLOMERATE with light brown fine to coarse sandstone matrix, matrix supported, subangular clasts.	E-W/7S
						@5' - Gravel to boulder CONGLOMERATE with light brown fine to coarse sandstone matrix, matrix supported.	@7' B N72W/19SW
						@6' - Gravel to cobble CONGLOMERATE with light brown fine to	@8.5' Approx.
10	9-12"	C		3.7	124.8	medium sand matrix, matrix supported, clasts are fractured and subangular.	scoured contact N30W/28SW
						@8.5' - Scoured irregular contact with CLAYSTONE.	@12.5' B
						@10' - Subangular gravel to cobble CONGLOMERATE, slightly friable light brown medium to coarse sandstone matrix, hard, moist.	N48W/29SW
15							
						@16' - Scoured contact with light brown silty fine grained SANDSTONE with occasional medium to coarse sand, hard, massive.	@16' Contact N2W/8NE
20	6-12"	C				@20' - Undulatory contact with subangular gravel CONGLOMERATE, occasional cobble, slightly friable light brown fine to coarse sandstone matrix, well graded, occasional silt, channelized, moist, hard.	@20' B N32W/16SW
							@23' Channel N70E/9SE
25						@25.5' - Scoured contact to fine to coarse grained SANDSTONE with gravel, moist.	@25.5' B N37W/19SW
						@27' - Grading to subangular gravel CONGLOMERATE with slightly friable light brown fine to coarse sandstone matrix, occasional cobbles, hard, moist.	@28.5' Contact N48E/8SE
30	20-12"	C		5.8	127.6	@28.5' - Scoured contact with silty fine to medium grained SANDSTONE with occasional subangular gravel, hard, moist.	
						@31' - Grading to subangular gravel to cobble CONGLOMERATE with light brown fine to coarse sandstone matrix, hard, moist.	
							@34.5' B N26E/22SE
35						@36' - Irregular, scoured contact to brown clayey fine grained SANDSTONE, moist, hard, massive.	@36' Contact N47E/8SE
						@37.5' - Grading to light brown fine grained SANDSTONE, slightly friable, hard, moist, massive.	
40	23-12"	C		6.7	122.1	@40' - Grading to gravel to cobble CONGLOMERATE, light brown fine to coarse sandstone matrix, hard, moist.	
45							

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.
121 - 135', 1723 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1987'±	DATE: 6/7/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
45						@45' - Gravel to cobble CONGLOMERATE, channels dipping SE and NE.	
						@46.5' - Irregular, scoured contact to brown clayey fine to medium grained SANDSTONE with slightly friable fine to coarse gravel, hard, moist.	
50				6.3	120.5	@47' - Grading to light brown gravelly SANDSTONE to gravel CONGLOMERATE, light brown fine to coarse sandstone matrix.	
						@51' - Grading to gravel to cobble CONGLOMERATE with fine to coarse sand matrix supported, highly channelized.	@52' Channel N22W/14SW
						@54.5' - Grading to light brown fine to coarse grained SANDSTONE with gravel, friable, hard, moist.	
55						@56' - Grading to subangular gravel to cobble CONGLOMERATE with light brown fine to coarse sandstone matrix.	
						@57' - Clast supported, highly channelized, gravel to cobble CONGLOMERATE.	
60	15-12"	C		10.7	121.9	@60.5' - Sharp scoured contact with brown sandy CLAYSTONE, slightly undulatory, paper thin shear at contact.	@60.5' Shear N46W/10SW
						@61' - Grading to gravelly SANDSTONE to subangular gravel CONGLOMERATE with slightly friable light brown fine to coarse sandstone matrix, channelized, well graded.	@60.5' Contact N84W/13SW
65							
						@67' - Interbedded brown fine grained SANDSTONE and gravel CONGLOMERATE, slightly friable.	
70	26-12"	C		7.1	123.4	@69' - Subangular gravel to cobble CONGLOMERATE, friable brown fine to coarse sandstone matrix, hard, very moist, well graded, crudely bedded with occasional 2"-6" thick fine to medium sandstone beds.	
75						@75' - Subangular gravel to cobble CONGLOMERATE, friable brown fine to coarse sandstone matrix, hard, very moist, well graded, crudely bedded.	
80	2-12"	C				@80' - Subangular gravel to cobble CONGLOMERATE, friable brown fine to coarse sandstone matrix, hard, very moist, well graded, crudely bedded.	
85							

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.
121 - 135', 1723 lbs.
136 - 155', 2223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1987'±	DATE: 6/7/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
80							
85						@85' - Moisture increasing in gravel CONGLOMERATE with slightly friable brown fine to coarse sandstone matrix, hard, moist.	
						@87' - Wet.	
						@88' - Gravel CONGLOMERATE with friable brown fine to coarse sand matrix, hard, wet.	
90	29-12"	C				@90' - Slow seepage in brown fine to coarse grained SANDSTONE to gravel CONGLOMERATE, sand matrix supported.	
						@91' - Grades to fine grained sandy SILTSTONE with occasional coarse gravel clasts.	
95							
	24-12"	C	X				
						@97' - Pervasively sheared CLAYSTONE, waxy surface, nearly horizontal, undulatory upper contact, shears cutting through silty fine grained SANDSTONE.	@97' Shear N43E/23SE
100						@98' - 4" thick undulatory shear.	@97.5' Shear N72W/31NE
						@98'3" - Contact with silty fine grained SANDSTONE, hard, moist, massive.	@98' Approx. shear N5E/5SE
						@100' - 4" CONGLOMERATE bed with subangular gravel and cobbles, fine to coarse sand matrix supported, wet.	
						@100.5' - Silty very fine grained SANDSTONE, massive.	@103.5' Approx. B N50W/18SW
105						@103' - 12" thick subrounded gravel CONGLOMERATE, slightly friable, fine to medium sand matrix, hard, wet.	
						@104' - Sharp, scoured contact with brown clayey fine grained SANDSTONE, hard, moist, massive.	
	30-10"	C					
						@107' - Conglomeratic fine to medium grained SANDSTONE, poorly bedded.	
110						@108' - Brown silty fine grained SANDSTONE, hard, moist.	
						@109' - 4" thick conglomeratic fine to medium grained SANDSTONE interbed.	
						@110' - 6"thick conglomeratic fine to medium grained SANDSTONE to clayey fine grained SANDSTONE, poorly defined bedding.	
115						@110.5' - Brown clayey fine grained SANDSTONE with occasional subangular fine gravels, very dense, moist.	@115.5' Approx. B N75E/9SE
						@115' - 6" thick conglomeratic fine to medium grained SANDSTONE.	
						@116.5' - 6" thick CONGLOMERATE.	@117' Approx. contact N65W/6SW
120			X			@117' - Sharp contact with CLAYSTONE, hard.	
						@118.5' - 1' thick CONGLOMERATE.	@119' B N50W/50NE
						@119' - Sharp contact with sheared clayey SANDSTONE, 6" thick, undulatory imbricated shears.	
						@120' - Strong brown CLAYSTONE, stiff, highly plastic, undulatory upper contact, sheared and waxy surface, pervasively sheared throughout.	@120' Approx. contact N45W/16SW
125							

ADDITIONAL COMMENTS: C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.
121 - 135', 1723 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1987'±	DATE: 6/7/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
120							
						@122.2' - Sharp contact with silty fine grained SANDSTONE, hard, moist, contact is not sheared.	@123' Contact N57W/32SW
125						@125' - 1-2" thick clay seam truncates higher angle shear.	
						@125' - 4" CONGLOMERATE just above clay seam.	@125' Clay seam N65W/13SW
						@125' - High angle clay shear through CONGLOMERATE, slickensides indicate horizontal motion along strike.	
						@125.5' - Brown silty fine to medium grained SANDSTONE, hard, moist.	@125' Shear N86E/66NW
130							
						@131' - Subangular fine to coarse grained gravel CONGLOMERATE, slightly friable, brown medium to coarse sand matrix, moderately graded, hard, moist, crudely bedded.	
						@132' - Gravel CONGLOMERATE.	@134' B N66W/9SW
135						@134' - Thinly bedded.	
						@137' - Contact with approximately 6" thick brown fine grained sandy SILTSTONE, hard, wet.	
						@138' - Discontinuous seepage.	
140						@138.5' - Brown silty fine grained SANDSTONE, wet, hard, massive.	
						@141' - Approximately 6" thick discontinuous SILTSTONE.	
145	25-12"	C				@145' - Brown silty fine grained SANDSTONE, hard, wet, massive.	
						@147' - Lower limit of zone of seepage.	
						@148' - Brown silty fine grained SANDSTONE with some clay, massive.	
150							
						@153' - Seepage from NE quadrant of boring in 12" thick gravel CONGLOMERATE.	
155	36-10"	C					
160						Total Depth - 155'	
						Seepage at 90', 138-147', and 153'	
						No caving	
						Backfilled	
165							

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.
121 - 135', 1723 lbs.
136 - 155', 2223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2091'	DATE: 6/12/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Saugus Formation : Dark brown clayey fine to coarse grained SAND with subangular gravel, moist, very dense, weathered.	
						@4' - Gradational contact with yellowish brown silty fine to coarse grained SANDSTONE with occasional gravel, hard, moist.	
5						@6' - Yellowish brown fine to coarse grained SANDSTONE with occasional subangular gravel, clasts include quartz, shist, and granitics, friable, moist, hard.	@6' Approx. contact N10E/8NW
						@8' - Discontinuous SILTSTONE (approx. 6" thick) on eastern quadrant of boring, massive, moist, hard.	
10	4-12"	C		5.4	115.1	@9' - Highly channelized fine to medium grained SANDSTONE to subangular gravel CONGLOMERATE, matrix supported, friable, hard, moist.	@13' Approx. BN16W/19SW
						@11' - Brown subangular gravel to cobble CONGLOMERATE, matrix supported, highly channelized, friable, hard, moist.	
15						@13' - Conglomeratic fine to coarse grained SANDSTONE, subangular to subrounded fine gravel to cobble clasts, moist, hard.	@16' Approx. BN70E/24NW
						@16 - Gravel to occasional boulder (<5%) CONGLOMERATE, channeled, crudely bedded, slightly friable, brown fine to coarse sand matrix, moist, hard.	
20	5-12"	C		5.7	120.2	@20' - Channeled CONGLOMERATE.	@20' Scoured channels dipping N & S
						@23' - Channelized contact with fine to medium grained SANDSTONE with coarse sand, friable.	@23' Contact N15E/21NW
25						@24' - Grading to subangular gravel CONGLOMERATE, sand matrix, matrix supported.	@25' Approx. BN45W/21NE
						@26' - Sharp, scoured contact with silty fine grained SANDSTONE with clay, massive.	@26' Contact N31W/25NE
						@27.5' - Irregular, discontinuous paper thin shear, waxy, clay lined.	
30	18-12"	C		13.4	119.9		
						@31' - Brown silty very fine grained SANDSTONE with very sparse coarse sand and fine gravel, moist, hard.	
						@32' - Grades to brown fine grained SANDSTONE with very sparse coarse sand and fine gravel, massive, moist, hard.	
35							
						@36.5' - Brown angular fine gravel CONGLOMERATE with clayey sand matrix, gradational upper contact (approximately 4" thick bed), moist, hard.	@37' Approx. contact N55E/25SE
						@37' - Brown fine grained sandy SILTSTONE, moist, hard.	
40	11-12"	C		17.4	111.4	@40' - Slightly waxy clayey SANDSTONE with carbonate nodules, poorly defined shears.	@40' Approx. attitude of carb. nodules N5E/25SE
45							

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.
121 - 135', 1723 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2091'	DATE: 6/12/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@43' - Grades to brown clayey fine grained SANDSTONE with occasional coarse sands and fine gravel, thickly bedded, hard, moist.	
45							
						@46.5' - Sandy CLAYSTONE (approx. 6" thick).	@46' Approx. contact E-W/12N
						@47.5' - Subrounded fine gravel CONGLOMERATE (approx. 6" thick).	
						@48' - Brown clayey fine grained SANDSTONE with occasional coarse sands and fine gravel, massive, hard, moist.	@47.5' Approx. BN75W/17NE
50	17-12"	C		10.6	104.4		
						@52' - Grades to conglomeratic fine to medium grained SANDSTONE, subangular fine to coarse gravel clasts, moist, hard (approx. 3" thick), lower contact is highly scoured and irregular.	
55						@55' - Sheared contact to brown fine grained sandy CLAYSTONE with poorly defined shears.	@55' Sheared contact N12W/60SW
						@56' - Grades to brown silty fine grained SANDSTONE with occasional subangular fine gravel, moist, hard.	
						@59' - Grades to brown medium to coarse grained SANDSTONE, moist, hard.	
60	13-12"	C		14.9	117.9	@60' - Contact with gravel and cobble CONGLOMERATE, brown silty fine to coarse sand matrix, matrix supported, increase in moisture to very moist.	@60' Contact N36W/16SW
65						@65' - Grading to gravel and cobble CONGLOMERATE with brown fine to coarse sand matrix, higher % of gravel and cobble clasts.	
						@67' - Interbedded gravel CONGLOMERATE with fine to coarse sand matrix and fine gravelly medium to coarse sandstone interbeds between 2" and 8" thick, sand is friable, both beds exhibit occasional coarse gravel.	@67' B N52W/34NE N75W/22NE N35W/31NE
70	20-12"	C		9.9	118.6		@67.5' B N49W/39NE
						@69'8" - Sharp contact with 1" thick clayey fine grained SANDSTONE, grading to fine to coarse grained SANDSTONE.	@69.5' Contact N30W/57NE
						@70' - Brown fine to coarse grained SANDSTONE with occasional cobbles.	@69'8" Contact N44W/21NE
75						@70.5' - Silty fine grained SANDSTONE, wet, hard.	
						@71' - Silty gravelly fine grained SANDSTONE.	@70.5' Contact N59W/15NE
						@71.5' - Brown CLAYSTONE, pervasively sheared, very stiff, waxy.	
			X			@72' - Very slow seepage in NW quadrant above 4" thick sheared claystone, grading to clayey fine grained SANDSTONE, waxy shear surfaces in claystone.	@72' Shear N42E/20NE
80	30-12"	C	X	13.4	122.1		@75.5' Contact N30E/13NW
						@72.5' - Massive brown silty very fine grained SANDSTONE to very fine grained sandy SILTSTONE, occasional seepage.	@79.5' Shear N10W/35SW
						@75.5' - Gravel CONGLOMERATE with fine to coarse sand matrix, wet.	
						@79.5' - Sheared CLAYSTONE, seepage around entire hole.	slicks bear S85W
85						@80' - 4" thick clay shear (across bedding).	

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.
121 - 135', 1723 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2091'	DATE: 6/12/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
80						@80.5' - Brown fine grained SANDSTONE, hard, wet.	@79.5' Shear N14E/56SE
						@82' - Grading to fine to coarse grained SANDSTONE, hard, wet.	slicks bear N84E
						@84' - Grading to gravelly fine to coarse grained SANDSTONE, hard, wet.	@80' Shear N5E/14NW
85						@85' - Grading to gravel cobble CONGLOMERATE with weakly cemented to slightly friable brown fine to coarse sandstone matrix.	@86' Approx. BN45E/18NW
						@87' - Grades to brown clayey fine grained SANDSTONE, hard, wet.	
90	26-8"	C				@90' - No sample recovered.	
						@91' - Grades to fine gravel CONGLOMERATE (approx. 12" thick) interbed.	
						@92' - Grades to brown clayey fine grained SANDSTONE.	
95						@93.5' - Fine to coarse grained SANDSTONE with occasional subround fine gravel.	@95' Shear N61W/7SW
						@95' - Sharp contact to 1" thick CLAYSTONE, pervasive shears throughout fine to coarse grained SANDSTONE with occasional subrounded fine gravel to coarse sand.	@95.5' Shear N31W/32NE
						@95.5' - Parallel shears (across bedding).	
100	24-9"	C		5.7	112.8	@98' - Grades to subrounded to subangular fine to coarse grained gravel CONGLOMERATE, weakly cemented to slightly friable, brown fine to coarse sand matrix, hard, wet.	@100' B N34W/20SW
						@102' - Heavy seepage.	@102' B N77W/20NE
						@103' - Grades to fine to coarse grained SANDSTONE.	
105						@104.5' - Sharp contact to clayey fine grained SANDSTONE.	@104.5' Approx. contact N35W/11SW
						@106' - Grading to sandy CLAYSTONE, pervasive shearing, very stiff, wet.	
						@106-108.5' - Brecciated sandy CLAYSTONE.	
						@108.5' - Clayey fine grained SANDSTONE, hard, wet.	
110	30-8"	C		15.3	110.7		
						@113' - Sharp contact to fine gravel CONGLOMERATE, weakly cemented brown fine to coarse sandstone matrix, hard, wet.	@113' Approx. contact N50W/27SW
115						@115' - Fine gravel CONGLOMERATE, crudely bedded, weakly cemented brown fine to coarse sandstone matrix, hard, wet.	
							@118' Approx. BN35E/25NW
120	28-10"	C		14.9	113.1		
						@122' - Contact to brown fine grained SANDSTONE.	
125							

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5619 lbs. 136 - 155', 2223 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.
121 - 135', 1723 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2091'	DATE: 6/12/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
120							
						@123' - Standing water in boring (after 24 hours), unable to downhole log below.	
125							
130	30-10"	C		12.1	123.1	@130' - Brown fine to coarse grained SANDSTONE, friable, wet, free water in sampler, hard.	
135							
						@137' - Brown pervasively sheared CLAYSTONE, highly plastic, wet.	
140	15-12"	C		16.7	108.0	@140' - Brown pervasively sheared CLAYSTONE, grading to brown fine grained SANDSTONE, wet, hard.	
145							
150							
155						Total Depth - 140' No caving Seepage below 70', standing water at 123' (24 hours after drilling completed) Backfilled	
160							
165							

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.
121 - 135', 1723 lbs.
136 - 155', 2223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2245'±	DATE: 6/13/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Topsoil: Dark gray brown clayey fine to coarse grained SAND with subangular to subrounded gravel to boulder clasts, weathered,dense, moist.	
						@2.5' - Mint Canyon Formation: Subangular to subrounded gravel to boulder CONGLOMERATE, weakly cemented olive brown fine to coarse sandstone matrix, well graded, moist, hard.	
5						@6' - Subangular to subrounded gravel to boulder CONGLOMERATE, weakly cemented olive gray fine to coarse sandstone matrix, moist, massive, hardwell graded clasts predominantly granitic with some meta volcanics, channelized, crudely bedded (less than 5% 12" diameter	
10	15/20	C		3.2	--	boulders).	@10' B N56W/13SW
						@10' - Subangular to subrounded gravel, cobble, boulder CONGLOMERATE, weakly cemented olive gray fine to coarse sandstone matrix, hard, moist.	
						@13' - Bedded zone of boulders.	
15						@15' - Subangular to subrounded gravel to boulder CONGLOMERATE, weakly cemented olive brown fine to coarse sandstone matrix, well graded, hard, moist, increase in boulders to 5-10%.	@15' Approx. BN60W/35SW
							@19' B
20	19/21	C	X	--	--	@20' - Subangular to subrounded gravel to boulder CONGLOMERATE, weakly cemented olive brown fine to coarse sandstone matrix, well graded, hard, moist.	N54W/23SW
						@21' - Percentage of boulders less than 5%.	
25							
						@27' - Subangular to subrounded gravel to boulder CONGLOMERATE, weakly cemented olive brown fine to coarse sandstone matrix, well graded, hard, moist, occasional poorly graded fine coarse grained gravel	@27' B N34E/17SE
30			X	--		approximately 12" thick.	
						@30' - Subangular to subrounded gravel to cobble (occasional boulder) CONGLOMERATE, weakly cemented olive brown fine to coarse sandstone matrix, hard, moist.	@33' B N61E/21SE
35							@35' B
						@36' - Sharp contact to olive gray fine grained SANDSTONE, moderately indurated, very hard, moist, massive.	N77W/23SW @36' Contact N62W/22SW
						@38' - Occasional thin beds of weakly cemented fine to medium grained SANDSTONE and thin beds of slightly friable conglomeratic	@38' B
40	11/23	C	X	8.2	120.1	medium to coarse grained SANDSTONE, clasts are subangular, fine to coarse gravel (up to 4" diameter), moist, very hard.	N36W/18SW
						@39.5' - Sharp sheared contact to clayey fine grained SANDSTONE (approx. 1" thick), moist, very hard, grading to weakly indurated medium to coarse grained SANDSTONE, very hard.	@39.5' Sheared contact N43W/26SW
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

LOG OF BORING B50

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2245'±	DATE: 6/13/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40						@40' - Light gray brown fine to coarse grained SANDSTONE with subangular to subrounded fine gravel, slightly friable, hard, moist.	
						@41' - Occasional thin beds of fine grained GRAVEL.	@42.5' B N34W/16SW
						@43' - Subangular gravel cobble CONGLOMERATE, occasional boulders, well graded, slightly friable, olive gray fine to coarse sandstone matrix,hard, moist.	
45							
						@47' - Sharp contact to fine to medium grained SANDSTONE, weakly indurated, very hard, moist.	@47' Contact N34W/17SW
						@48' - Grades to subangular to subrounded fine gravel to cobble CONGLOMERATE, weakly cemented, olive gray fine to coarse sandstone matrix, hard, moist.	
50	10/15	C		17.8	110.3		@51' B N16W/26SW
						@50' - *Light gray brown fine* to coarse grained SANDSTONE with subangular to subrounded gravels, occasional cobbles, moist, hard.	
			X			@52.5' - Sharp contact to light olive gray fine to medium grained SANDSTONE, weakly indurated, moist, hard.	@54.75' Shear N17W/16SW
55						@54' - Grades to subangular to subrounded fine gravel to cobble CONGLOMERATE, weakly cemented.	
						@54.5' - Approximately 12" thick clayey fine grained SANDSTONE, pervasively sheared, slightly plastic, stiff, moist, grading to subangular to subrounded fine grained gravel to cobble CONGLOMERATE, massive, hard, moist.	
60	20/30	C		3.5	13.6		
						@60' - Light gray brown fine to coarse grained SANDSTONE with subangular to subrounded coarse gravel to cobble clasts, hard, moist, friable, massive.	
65							
			X			@67' - Olive brown fine to coarse grained SANDSTONE with subangular to subrounded gravel, moderately indurated, moist, hard, occasional cobbles.	
70							
75						Total Depth - 67' No groundwater No caving Backfilled	
80							
85							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1765'±	DATE: 6/15/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Topsoil: Medium brown fine grained SAND with fine gravel, moist.	
						@3' - Landslide Deposit: Near vertical carbonate veinlets/nodules approximately 8" diameter.	
5						@4.5' - Medium to coarse grained SANDSTONE with subangular to subrounded fine to coarse gravel, friable, rootlets, very dense, moist.	
						@7' - Grades to fine grained SANDSTONE, sparse fine gravel, slightly friable, very dense, moist, occasional rootlets, massive.	
10	6/10	C		12.2	113.4	@10' - Light orange to grayish brown silty fine to coarse grained SANDSTONE with fine to coarse gravels, occasional boulders (less than 5%), very dense, moist.	
							@13' Contact N15W/46SW
15							
							@17.5' B N87E/27SE
20	7/15	C		15.1	116.0	@20' - Light orange brown fine to coarse grained SANDSTONE with clay, subangular to subrounded gravel, layers of highly plastic clay, moist, very dense, moderately to well graded.	
			X			@21' - Clay shear (1-2" thick), waxy, internally sheared, plastic, no distinct slicks.	@21' Shear N52W/9SW
25							@25' Shear N78W/21SW
							@26' Shear N79E/29NW
						@28' - Grades to olive fine to medium grained SANDSTONE with fine gravel.	
			X				@28.5' Approx. Shear N20E/15NW
30	6/18	C		10.0	121.5	@28.5' - Contact with shear, updip side of undulatory upper contact with multiple shears, to 12" thick zone of shearing in clayey fine grained sand.	
						@29.4' - Basal shear surface (undulatory).	@29.4' Basal Shear N22W/6SW
						@30' - Saugus Formation: Olive silty fine grained SANDSTONE with clay, oxidized, grading to greenish gray fine grained sandy SILTSTONE, hard, moist, massive.	
35							N53W/6SW
						@32.5' - Contact to olive silty fine to medium grained SANDSTONE with occasional fine gravel, hard, moist, slightly friable, massive.	@34' Approx. BN5W/7SW
						@34' - Contact to 4" thick SILTSTONE, grades to olive fine to medium grained SANDSTONE, slightly friable, moist, hard.	@36.5' B N34W/8SW
40	15/30	C		5.4	108.7	@40' - Light to medium yellow brown medium to coarse grained SANDSTONE, subangular to subrounded fine gravels, occasional cobbles, very dense, moist, moderately graded.	
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1765'±	DATE: 6/15/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40						@41' - Fine to coarse grained gravel CONGLOMERATE with cobbles, well graded, channels dip north and south, slightly friable olive coarse grained sandstone matrix.	
						@44' - Medium to coarse grained SANDSTONE with occasional fine gravel and cobble CONGLOMERATE.	
45						@46' - Siltstone ripup clasts.	@46' B N30E/11NW
50	10/30	C		6.2	126.0	@50' - Light yellow brown medium to coarse grained SANDSTONE with well graded fine gravel to boulder (10% boulder clasts) CONGLOMERATE, moist, very weathered clasts.	@50' Approx. BN20W/21SW
						@58' - Fine gravel to cobble CONGLOMERATE with occasional boulder clasts, well graded, crudely bedded, slightly friable, yellow brown fine to coarse grained sandstone matrix, hard, moist, crudely bedded.	
55			X				
							@57' Approx. BN10W/29SW
60	20/30	C		8.5	117.6		
65							
70	20/25	C		9.6	111.7	@70' - Subangular to subrounded fine to coarse gravel and occasional cobble CONGLOMERATE with yellow brown medium to coarse grained sandstone matrix, well graded, hard, moist.	
75						Total Depth - 72' No groundwater No caving Backfilled	
80							
85							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2245'±	DATE: 6/19/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Mint Canyon Formation: Tan subrounded gravel to cobble CONGLOMERATE with fine to medium sand matrix, clasts are fractured in upper 1', moist.	
						@2.5' - Subrounded to rounded cobble to boulder CONGLOMERATE with fine to medium sand matrix, hard, rootlets, matrix supported, channelized.	
5							
						@7' - Scoured contact with yellowish brown fine to medium grained SANDSTONE, hard, channelized, moist.	@7' Channel N66W/24SW
						@8' - Undulatory contact with yellowish brown cobble to gravel CONGLOMERATE, coarse sand matrix, matrix supported, moist, hard.	@8' Contact N60W/28SW
10	10-8"	C		1.8	133.7		
						@9.5' - Yellowish brown gravel-cobble-boulder CONGLOMERATE, fine to coarse sand matrix, matrix supported, channelized, approximately 15% boulders, moist.	
						@11' - Boulder approx. 2' diameter.	
15						@12' - Tan to gray cobble to boulder CONGLOMERATE, fine to coarse sand matrix, matrix supported, channelized.	
						@17' - Tan to gray cobble to boulder CONGLOMERATE, fine to coarse sand matrix, matrix supported, channelized.	
20	9-12"	C		10.7	122.0		
						@23' - Light olive brown gravel-cobble-boulder CONGLOMERATE, fine to coarse sand matrix, matrix supported, channelized, decrease in % boulders, cobbles and gravel, moist, hard.	
25						@25' - Light olive brown gravel-cobble-boulder CONGLOMERATE, fine to coarse grained sand matrix, matrix supported, channelized, increase in frequency of coarse clasts, moist.	
30	26-12"	C		7.6	124.3	@30' - Light olive brown gravel to cobble CONGLOMERATE, friable fine to coarse sand matrix, matrix supported, hard, moist.	
35							
						@36.5' - Channelized, scoured contact to light olive brown fine grained gravelly fine to coarse grained SANDSTONE, hard, moist.	@36.5' Channel N34W/17SW
						@38' - Contact to light yellow brown subangular to subrounded gravel to cobble CONGLOMERATE, hard, moist.	@38' Contact N50W/24SW
40							
45							

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.

SUBSURFACE DATA

LOG OF BORING B52

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2245'±	DATE: 6/19/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@41' - Light yellow brown subangular to subrounded gravel to cobble CONGLOMERATE, moist.	
	20-12"	C		4.8	128.3		
45						@45.5' - Scoured, channelized contact to light olive brown fine to coarse grained SANDSTONE, occasional gravel, moist.	@45.5' Scoured contact N69W/19SW
						@46' - Contact to fine to medium grained SANDSTONE with occasional coarse sand, moist.	@46' B N50W/19SW
50	15-10"	C		6.3	114.0	@47' - Irregular contact to light olive brown gravel to cobble CONGLOMERATE with occasional boulders (approximately 5%), weakly cemented olive gray fine to coarse sand matrix, matrix supported, moist, hard.	@47' Contact N36W/20SW
						@49.5' - Contact to light olive brown fine to coarse grained SANDSTONE with fine gravel, friable, moist.	@49.5' Contact N45W/21SW
55						@50.5' - Contact to light olive brown gravel to cobble with occasional boulder CONGLOMERATE, fine to medium sand matrix, matrix supported, moist.	@50.5' Contact N57W/16SW
						@51' - Approximately 18" diameter boulders.	
60	17-12"	C		5.5	122.8	@57' - Light olive brown gravel to cobble with occasional boulder CONGLOMERATE, fine to medium sand matrix, matrix supported, moist, hard.	
65						@65' - Cobble to boulder CONGLOMERATE, clast supported to matrix supported, weakly cemented olive gray fine to medium sand matrix with occasional gravel, moist, hard.	@64' B N20E/26NW
70	25-12"	C		4.2	142.0	@70' - Cobble to boulder CONGLOMERATE, clast supported to matrix supported, weakly cemented olive gray fine to medium sand matrix with occasional gravel, moist, hard.	
75							
						@77.5' - Scoured contact to light olive brown fine to coarse grained SANDSTONE with fine gravel, moist, hard.	@77.5' Contact N44W/29SW
80						@78.5' - Contact to light olive brown gravel to cobble CONGLOMERATE, weakly cemented olive gray fine to coarse sand matrix, matrix supported, moist, hard.	@78.5' B N28W/22SW
85							

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2245'±	DATE: 6/19/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
80						@81' - Grading to light olive brown cobble to boulder CONGLOMERATE, weakly cemented olive gray fine to coarse sandstone matrix.	
85						@85.5' - Grading to light olive brown fine to coarse grained SANDSTONE.	
						@86.5' - Subrounded gravel to boulder CONGLOMERATE, well graded, crudely bedded, weakly cemented olive gray fine to coarse sand matrix, hard, moist.	@86' B N34W/22SW
	24-12"	C		5.9	107.9		@89'± B N10E/23NW
90						@90' - Subrounded fine gravel to cobble CONGLOMERATE, well graded, crudely bedded, weakly cemented olive gray fine to coarse sandstone matrix, hard, moist.	@92' B N10W/19SW
95						@95' - Subrounded fine gravel to cobble CONGLOMERATE, well graded, crudely bedded, weakly cemented olive gray fine to coarse sandstone matrix, hard, moist.	@98'± B N40W/20SW
100						@100' - Subrounded fine gravel to cobble CONGLOMERATE, well graded, crudely bedded, weakly cemented olive gray fine to coarse sandstone matrix, hard, moist.	
105						@105' - Subrounded fine gravel to cobble CONGLOMERATE, well graded, crudely bedded, weakly cemented olive gray fine to coarse sandstone matrix, hard, channeled, moist.	@106' B N47W/19SW
110						@109' - Subrounded fine gravel to cobble CONGLOMERATE, well graded, crudely bedded, weakly cemented olive gray fine to coarse sandstone matrix, hard, channeled, moist.	
115						@113' - Subrounded fine gravel to cobble CONGLOMERATE, well graded, crudely bedded, weakly cemented olive gray fine to coarse sandstone matrix, hard, channeled, moist.	@113'± B N30W/24SW
120						@118' - Subrounded fine gravel to cobble CONGLOMERATE, well graded, crudely bedded, weakly cemented olive gray fine to coarse sandstone matrix, hard, channeled, moist.	
125						@122' - 12" thick olive gray fine to medium grained SANDSTONE to subrounded gravel to boulder CONGLOMERATE, well graded, weakly cemented olive gray fine to coarse sandstone matrix, moist. Total Depth - 123', No groundwater, No caving, Backfilled	

ADDITIONAL COMMENTS:

C = Modified California Sampler

Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1770'±	DATE: 6/16/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Saugus Formation: Dark grayish brown clayey fine grained SANDSTONE with abundant subangular fine gravel, very dense, moist.	
						@4' - Grades to dark yellowish brown fine grained SANDSTONE with subangular fine gravel, very dense, moist, crudely bedded.	
5							
10	6/12	C		11.2	122.5		@10.5' Shear N44W/17SW
			X			@10.5' - Sheared clay at contact to strong brown silty fine grained SANDSTONE, very dense, moist.	@12' Approx. shear N12W/8SW
						@12' - 2"-6" thick sheared clay, stiff, highly plastic, to dark yellow brown fine to medium grained SANDSTONE with fine gravel and clay,	
15			X			very dense, moist, massive.	@14' B N25W/25SW
						@17' - Brown SILTSTONE, very stiff, moist, to clayey fine grained SANDSTONE, hard, moist, massive.	
						@19' - Grades to slightly friable medium to coarse grained SANDSTONE	
20	10/15	C		12.0	124.6	with fine gravel, hard, moist, crudely bedded.	@20' Contact N65W/16NE
						@20' - Scoured contact to fine grained SANDSTONE, hard, moist.	
						@22' - 12" thick gravel CONGLOMERATE channel, to slightly friable yellow brown fine to medium grained SANDSTONE, massive, hard, moist, grading to channelized medium to coarse grained SANDSTONE	@22' Channel N34E/17NW
25						and gravel CONGLOMERATE.	@23' Contact N28W/13SW
							@26' Channel N-S/13E
						@27' - Scoured contact (E dipping) to dark yellow brown fine grained SANDSTONE, massive, hard, moist.	
30	12/28	C		16.0	114.5		
			X			@32' - 1"-3" thick strong brown CLAY shear, highly plastic, to 12" CLAYSTONE, grading to yellow brown fine grained SANDSTONE, massive, hard, moist.	@32' Shear N6E/7NW
35							
						@36' - Pinhole seep on NW wall.	
						@37' - Nearly horizontal, undulatory 1" thick CLAY seam, highly plastic, sheared.	@37' Shear Horizontal
40	12/22	C		10.1	127.9	@40' - Undulatory, nearly horizontal, highly plastic 1" thick CLAY shear, to yellow brown fine grained SANDSTONE with subangular gravel, massive.	@40' Shear Horizontal
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

LOG OF BORING B53

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1770'±	DATE: 6/16/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@42' - Grading to subangular fine to coarse grained gravel CONGLOMERATE, well graded, crudely bedded, slightly friable yellow brown fine to coarse grained sandstone matrix, hard, moist.	
45						@44' - Sharp, slightly scoured contact to yellow brown clayey fine grained SANDSTONE, massive, hard, moist.	@44' Approx. contact N40E/44NW
						@47' - Grading to slightly friable medium to coarse grained SANDSTONE with abundant subangular fine gravel, hard, moist.	
50	10/20	C		13.8	122.7	@49' - Sharp, slightly scoured contact to clayey fine grained SANDSTONE, hard, moist, massive, with occasional subangular fine gravel.	@49' Approx. contact N-S/5W
						@52' - Grading to slightly friable subangular fine gravel CONGLOMERATE.	
						@53' - Irregular sharp contact to clayey fine grained SANDSTONE with occasional carbonate nodules and fine gravel, massive, hard, moist.	
55							
60	15/20	C		12.4	119.2	@60' - Brown clayey SILTSTONE, massive, hard, moist.	
						@63' - Grades to massive dark yellow brown fine grained SANDSTONE with subangular fine gravel, hard, moist.	
65							
						@68' - Grades to massive dark yellow brown fine grained SANDSTONE with subangular fine gravel, hard, moist.	@68' Approx. BN70W/14NE
70	15/25	C		10.6	120.9		
75						Total Depth - 75' Light seepage at 36' No caving Backfilled	
80							
85							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1845'±	DATE: 6/19/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Landslide Deposit: Dark grayish brown medium to coarse grained SAND with gravels, subangular to subrounded, clayey, moist, very dense, occasional rootlets.	
5							
						@7.5' - Grades to light orange brown medium to coarse grained SANDSTONE, increasing coarse gravels with depth, moist, dense, occasional rootlets.	
10	6/10	C		12.2	113.5	@10' - Light orange brown fine to coarse grained SANDSTONE with traces of sandy clay, subangular to subrounded fine to coarse gravels, occasional small cobbles, well graded, moist, very dense.	@10.8' Contact N32E/32NW
						@10.8' - Medium brown CLAY, stiff, occasional rootlets, downdip side approx. 1/4" to 1/2" thick, updip side approx. 12" thick.	@12' Approx. BN30E/29NW
15						@11' - Grades to slightly friable medium to coarse grained SANDSTONE with coarse gravels, moist, dense.	
						@13' - Severely weathered granite boulder in gravel cobble CONGLOMERATE with slightly friable light orange brown medium to coarse grained sandstone matrix, moist, dense, gravels and cobbles	@18' Contact N46E/16NW
20	6/12	C		5.9	119.7	increase with depth.	
						@18' - Scoured contact to orange brown clayey SILTSTONE with gravels, grading to SILTSTONE with sand.	
						@22' - Interbeds of gravel to cobble CONGLOMERATE with medium to coarse grained sandstone matrix and SILTSTONE, moist, dense.	
25							
						@26.3' - Highly scoured contact to fine to coarse grained silty SANDSTONE, occasional gravels, moist, slightly friable, massive.	@26.3' Contact N50E/50SE
30	8/12	C		8.9	122.3	@30' - Yellowish orange brown fine to medium grained SANDSTONE with subrounded to subangular fine to coarse gravel channels, moist, dense, moderately graded.	
						@34' - Subangular to subrounded gravel cobble CONGLOMERATE, slightly friable fine to coarse grained sand matrix, very dense, moist.	@34' Approx. BN50W/29SW
35							
						@38' - Interbeds of gravel cobble CONGLOMERATE with medium to coarse grained sandstone matrix and fine grained silty sandstone (2 6" thick interbeds).	@39' Approx. BN66W/19SW
40	10/13	C		11.4	120.9		
						@40' - Yellowish brown medium to coarse grained SANDSTONE with subangular to subrounded fine to coarse gravels, occasional cobbles, well graded, moist, dense.	
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1845'±	DATE: 6/19/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@42' - Scoured, irregular contact to fine grained sandy SILTSTONE, hard, moist.	
						@43' - Grades to fine to medium grained SANDSTONE with occasional gravels.	
45						@45' - Grades to fine grained SANDSTONE with occasional clay.	
						@49' - Interbedded fine grained sandy SILTSTONE and gravel cobble	
50	10/18	C		7.0	124.2	CONGLOMERATE, friable, moist.	@50' Approx. BN80E/12SE
						@50' - Yellowish orange brown medium to coarse grained SANDSTONE with fine to coarse gravels, subangular to subrounded, well graded, dense, moist.	@53' B N87E/14SE
						@52' - Interbedded gravel cobble CONGLOMERATE and medium to coarse grained SANDSTONE. Conglomerate is wet.	
55			X			@56' - Sharp contact to CLAY, water seepage stops at top of contact, imbricated, sheared (not sheared at contact), low plasticity.	@56' Contact N84E/21SE
						@56.5' - Upper shear, highly plastic, mullion surface, very stiff, 1-2" thick.	@56.5' Shear N80E/6SE
60	10/20	C		10.9	103.3	@56.9' - Lower shear, no slicks, mullioned surface just below shear.	@56.9' Shear N69W/4SW
						@57' - Saugus Formation: Yellowish red brown silty fine grained SANDSTONE with occasional subangular to subrounded gravels, moist, dense.	@62' Approx. contact N70W/6SW
						@60.5' - Contact to approx. 3" thick SILTSTONE, scoured and irregular interbeds.	
65						@62.3' - Discontinuous gravel bed.	@64' Channel N40E/23SE
						@63' - Grades to gravel cobble CONGLOMERATE with medium to coarse grained sand matrix, hard, moist, channelized.	
70	13/20	C		9.6	114.9	Total Depth - 70'	
						Seepage from 55-56'	
						No caving	
						Backfilled	
75							
80							
85							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2145'±	DATE: 6/20/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Colluvium: Brown clayey gravelly SAND, dry, hard.	
						@1' - Mint Canyon Formation: Gravel cobble CONGLOMERATE with occasional boulders, fine to medium grained sandstone matrix, subangular to subrounded, moist, dense.	
5							
							@7' Approx. BN65W/21SW
							@7.5' Approx. Channel N65E/21SE
10						@10' - Light olive brown gravel cobble CONGLOMERATE with occasional boulders, fine to medium grained sand matrix, moist, very dense.	
							@10' Approx. BN15W/22SW
						@13' - Boulder (approximately 24" diameter) metavolcanic, granitic, schist, occasional volcanic clasts.	@13' Approx. BN45W/21SW
15						@15' - Light olive brown gravel cobble CONGLOMERATE with occasional boulders, fine to medium sand grained sand matrix, moist, hard.	
							@17' Approx. BN45W/21SW
20	10/15	C		9.5	106.7		
						@21' - Subangular to subrounded fine gravel cobble CONGLOMERATE, well graded, weakly cemented, olive gray fine to coarse grained sandstone matrix, hard, moist, crudely bedded.	
25						@23' - Scoured contact to light olive brown fine to coarse grained SANDSTONE, weakly indurated, moist, massive.	
							@26.5' B N38W/22SW
						@27' - Thin (1-2' thick) SILTSTONE interbedded (3" apart) with subangular to subrounded fine gravel cobble CONGLOMERATE, olive gray fine to coarse grained sandstone matrix.	@29' B N8W/22SW
30	10/20	C		4.7	---	@29' - Seepage in NW quadrant, then wet all around with depth.	
						@30' - Fine gravel cobble CONGLOMERATE with light olive brown fine to coarse grained sandstone matrix, weakly to moderately cemented, well graded, hard, moist, crudely bedded, occasional boulders.	
35						@35' - Subangular to subrounded coarse gravel cobble CONGLOMERATE with medium to coarse grained sandy clay matrix, wet, hard.	@36' Channel N80E/25NW
						@38' - Fine gravel cobble CONGLOMERATE with light olive brown fine to coarse grained sandstone matrix, weakly to moderately cemented, well graded, hard, moist, crudely bedded.	
40	10/25	C		4.9	127.4		
						@40' - Approximately 12" thick conglomeratic fine to medium grained SANDSTONE, scoured contact.	
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

LOG OF BORING B55

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2145'±	DATE: 6/20/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@41' - Boulder clasts, moderately cemented.	
45							@45' Approx. BN5W/23SW
						@46' - Fine to medium grained SANDSTONE bed, scoured contact (approximately 6" thick), very hard, moist, massive.	@47' B N29W/24SW
			X				@49' Approx. BN34W/28SW
50						@50' - Gravel cobble CONGLOMERATE with occasional boulders with olive brown fine to coarse grained sandy clay matrix, moist, hard.	@51' Approx. BN34W/28SW
55							
60	30/B	C		13.8	116.2	@60' - Subangular to subrounded gravel cobble CONGLOMERATE, weakly cemented olive brown sandy clay matrix, hard, moist.	
			X				
65						@64' - Subangular to subrounded gravel cobble CONGLOMERATE with moderately cemented olive gray fine to medium grained sandstone matrix, well graded, very hard, moist.	
70						Refusal at 65' Seepage at 29-30' No caving Backfilled	
75							
80							
85							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2066'±	DATE: 6/26/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0			X			Colluvium: Brown fine to coarse grained SAND with clay and subangular to subrounded fine gravel, moist, hard, rootlets.	
5						Saugus Formation: Yellowish brown conglomeratic medium to coarse grained SANDSTONE with fine to coarse gravel, occasional fine boulder, well graded, moist, very dense, crudely bedded.	@8' Approx. BN30W/20SW
10	8/12	C		3.6	122.7	@10' - Yellowish brown conglomeratic medium to coarse grained SANDSTONE with fine to coarse gravel, occasional fine boulder, well graded, moist, very dense, crudely bedded.	@10' Approx. BN85W/22SW
15						@15' - (6-12" thick) SILTSTONE interbed, irregular, scoured by conglomeratic SANDSTONE, irregular lower contact.	@15' Approx. contact N10W/45-60SW
						@18' - Fine gravel CONGLOMERATE, coarsening upwards.	@17' Approx. BN15W/26SW
20	10/14	C		8.0	126.0	@20' - Yellowish brown medium to coarse grained SANDSTONE with silt, fine to coarse gravel, occasional cobble, subangular to subrounded granitic clasts, moist, hard.	@20.5' Approx. BN8E/28NW
			X			@21' - Discontinuous medium brown CLAY, pervasively sheared.	@22.5' Approx. shear N20E/23NW
25						@22.5' - Highly irregular contact to CLAY, grades to sandy CLAY, pervasively sheared (approximately 1" thick).	@24.5' Approx. shear N60W/5SW
						@23.5' - Downdip side of contact, pervasively sheared CLAY, grades to sandy CLAY, moist, hard, massive.	
30	5/8	C				@24.5' - Approximately 1/8" thick CLAY shear (no slicks), plastic, stiff, grades to blocky clayey SILTSTONE to clayey fine grained SANDSTONE, hard, moist.	
						@26.5' - Interbeds of highly scoured coarse grained SANDSTONE with gravel, clayey fine grained SANDSTONE with occasional gravels, fine and coarsening sequences.	
35						@29' - Yellow brown fine to coarse grained SANDSTONE with gravel, grades to clayey fine to coarse grained SANDSTONE.	
						@33' - Silty fine grained SANDSTONE, grading to yellow brown silty fine to medium grained SANDSTONE, moist, hard.	@36' Approx. contact N60E/35SE
40	10/13	C		9.9	125.4	@36' - Sharp contact to brown medium to coarse grained SANDSTONE with some gravels at contact, moist, hard.	@37' Approx. channel N55E/58SE
						@37' - Gravel channels in medium to coarse grained SANDSTONE, slightly friable, moist, hard.	
						@37.5' - Sharp contact to clayey SILTSTONE to scoured, irregular, roughl horizontal contact with 1" thick CLAYSTONE within irregular gravel lens, discontinuous.	@37.5' B N7W/14NE
45			X				

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2066'±	DATE: 6/26/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@42' - Dark yellow brown clayey fine grained SANDSTONE, occasional fine gravel, moist, hard.	
						@43.5' - Sharp contact to brown clayey fine grained SANDSTONE, moist, hard.	@43.5' Approx. contact N45W/12SW
45						@45' - Pervasively sheared CLAYSTONE, sheared zone (approximately 12" thick) grades to clayey fine grained SANDSTONE with pervasive shearing.	
						@48' - Fine to medium grained SANDSTONE with fine gravels, moist, massive.	
50	12/18	C		10.0	126.0	@50' - Medium brown fine to coarse grained clayey SANDSTONE with occasional fine gravels, moist, hard.	
						@53' - Increase in subangular coarse gravel clasts in medium brown medium to coarse grained SANDSTONE, moist, subangular clasts.	
55							
						@56' - Sharp contact, brown clayey fine grained SANDSTONE, moist.	@56' Approx. BN55W/10SW
							@56.5' Approx. contact N20W/10SW
60	15/20	C		12.1	119.6	@60' - Medium brown clayey fine to coarse grained SANDSTONE with subangular fine gravel, moist, hard.	
65							
						@67' - Strong brown medium to coarse grained clayey SANDSTONE, fine gravels, moist, hard.	
70	15/15	C		10.6	120.0	@70' - Gray light brown fine to coarse grained silty SANDSTONE with clay, fine gravels, subangular clasts, well graded, moist, hard.	
						@72' - Coarse cobble and gravel clasts in medium to coarse grained SANDSTONE, moist, hard, well graded.	
75						Total Depth - 72'	
						No groundwater	
						No caving	
						Backfilled	
80							
85							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2105'	DATE: 6/27/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Saugus Formation: Fine to coarse grained SANDSTONE with silt and fine gravel, graded, very dense, brown, moist, weakly indurated, rootlets, veins of light yellowish brown fine gravelly silty fine grained SAND, dry, and patches of very dark brown clayey SANDSTONE to CLAYSTONE.	
5						@6'7" - Grades to 1'7" thick coarse grained gravel CONGLOMERATE with fine to coarse grained sandy matrix, slightly friable to friable with depth, reddish brown, roots, metamorphic (schist and gneiss) clasts.	
						@8'2" - Sharp, irregular contact with fine grained SANDSTONE with fine gravel,	@8'2" C N61E/42NW
10	6/12	C		8.2	124.9	clay, and silt, poorly graded, dense, brown to light brown, moist, rootlets.	
						@8'7" - Grades to fine to medium grained SANDSTONE with clay, silt, and fine gravel, graded to well graded.	@11.5' C N61E/35NW
						@9'9" - Fine grained sandy silty CLAYSTONE, non-plastic, grades to fine grained gravelly silty clayey fine grained SANDSTONE, poorly graded to graded, dense,	@12' C N55E/34NW
15						dark brown, moist, rootlets.	
						@11.5' - Sharp contact with 6" thick coarse grained gravel CONGLOMERATE with silty fine to coarse grained sand matrix, well graded, dense, brown, moist, *friable, no continuous thickness around hole, channeled.*	
						@12' - Sharp contact with fine grained sandy silty CLAYSTONE, graded, very stiff,	
20	7/10	C		9.2	111.6	dark brown, moist, plastic, grades to fine grained SANDSTONE at 14' and coarse grained gravel CONGLOMERATE at 15', slightly friable to friable.	
						@15.5' - Clayey silty fine grained SANDSTONE, very dense, brown, grades to 2" thick coarse grained gravel CONGLOMERATE.	@22'5" Shear N46E/21NW
25						@16.5' - Silty fine to coarse grained sand matrix, graded, slightly friable, lesser gravel than material above.	
						@16'8" - Sharp contact with CLAYSTONE with sand and silt, poorly graded, very stiff, brown, moist, grades to silty fine to medium grained SANDSTONE.	@26.5' Shear N64E/13NW
						@17'7" - Grades to coarse grained gravel CONGLOMERATE.	@27' C N70E/36NW
						@19'3" - Slightly friable, small percentage of gravel.	
30	10/12	C		5.3	124.7	@20' - Sharp contact with CLAYSTONE.	@30'8" C N73E/16NW
						@22'5" - Sheared CLAYSTONE with upper and lower bounding shears, no slickensides, grades to coarse grained gravel CONGLOMERATE, slightly friable to friable.	
35						@24'9" - Sharp, irregular, contact with CLAYSTONE, grading to fine grained SANDSTONE.	
						@25'10" - CLAYSTONE, sharp contact with 12" thick coarse grained gravel CONGLOMERATE with friable fine to coarse sand matrix.	
						@26.5' - 1mm thick sheared CLAY with well defined shear, no slickensides, highly plastic, moist.	
40	9/11	C		17.0	110.7	@28' - Contact between CONGLOMERATE above and CLAYSTONE, brown, grading to 2" thick coarse grained gravel CONGLOMERATE at 30'8", yellowish brown.	
						@30'10" - Fine grained gravelly silty fine grained SANDSTONE, graded, light brown, moist, slightly friable.	
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2105'	DATE: 6/27/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40						@34' - Coarse grained gravel CONGLOMERATE with fine to coarse sand matrix.	
						@34'5" - Fine grained sandy SILTSTONE, yellowish brown, grading to fine grained sandy clayey SILTSTONE with trace gravel, brown.	
						@37'2" - Silty CLAYSTONE streaks white, dry.	
						@38'10" - SILTSTONE, grades to silty fine grained SANDSTONE, then to coarse grained gravel CONGLOMERATE beds, approximately 6" thick, with light brown silty fine grained SANDSTONE between 39' and 40'4".	
45							
						@40'9" - Sharp contact with CLAYSTONE, poorly graded, very stiff, brown, moist, waxy (suggesting shear), but no shear plane visible.	
						@42' - Grades to silty fine to medium grained SANDSTONE with trace fine gravel, graded, hard, light brown, moist, friable to slightly friable.	
50	10/14	C		20.8	106.5		
						@44'3" - Grades to clayey fine grained sandy SILTSTONE, poorly graded, very stiff to hard, moist, brown.	
						@46'9" - Grades to coarse grained gravel CONGLOMERATE, moist, friable, irregular contact with claystone below, contact dips roughly NNE.	
55						@48'3" - Silty CLAYSTONE, poorly graded, very stiff, dark brown, moist, highly plastic, roughly horizontal.	
						@48'8" - Clayey SILTSTONE with fine sand, poorly graded, hard, light brown, moist.	
						@53'4" - Grades to clayey silty fine grained SANDSTONE with trace gravel, graded, hard, dark brown, moist.	
60	15/20	C		16.8	113.7		
						@60' - Grades to fine grained gravel CONGLOMERATE with clayey fine to coarse grained sand matrix, well graded, hard, dark brown, moist.	
65						Total Depth - 60'	
						No groundwater	
						No caving	
						Backfilled	
70							
75							
80							
85							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1696'	DATE: 6/27/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Colluvium: Tan fine to coarse grained SAND with subangular cobbles and gravel, dry.	
						@3' - Saugus Formation: Light brown silty fine to medium grained SANDSTONE with gravel, moist, dense, poorly graded, rootlets, occasional streaks of white fine grained dry material oriented subvertical and subhorizontal.	@3'3" B N17W/11SW
5							
						@8' - Yellow fine grained SANDSTONE, 1" thick gray green fine subrounded gravel CONGLOMERATE with fine to medium grained sand matrix, weakly cemented, well graded, dense, moist.	@7' C N54W/7SW
10						@10' - No sample recovered.	@10'2" C N67W/12SW
						@10'2" - Abrupt, irregular contact with gravel cobble CONGLOMERATE with slightly friable to friable fine to coarse grained sand matrix, well graded, dense to very dense, pale brown, moist to wet, subangular to subrounded metamorphic clasts.	@14'1" Approx. CN56E/15SE
15	6-10"	C		11.7	116.0		
						@12' - Yellowish brown friable fine to coarse grained SANDSTONE with gravel to occasional cobbles, moist.	
						@14'1" - Sharp irregular scoured contact with yellowish brown silty fine grained SANDSTONE, poorly graded to graded, very dense, moist.	
20						@15' - Olive fine grained SANDSTONE with silt, moist, hard.	
						@16'7" - 4" thick fine to coarse grained subangular gravel CONGLOMERATE with pale brown slightly friable to friable fine to coarse grained sand matrix, well graded, hard, very moist.	
						@20'11" - Silty fine grained SANDSTONE, poorly graded, hard, interbedded light brown, orange brown, and gray brown, moist, shallow, subhorizontal bedding, cross bedding, only exposed in SE wall, channel shaped.	
25							
	10-10"	C		6.0	117.5		
						@21' -Tan fine to coarse grained SANDSTONE with subangular gravel to cobble clasts, moist.	
30						@24'5" - CONGLOMERATE, extremely friable.	
						@27' - Pale olive friable medium grained SAND with occasional coarse gravel, moist, hard,	
						@33' - Light brown subangular to subrounded gravel to cobble CONGLOMERATE, friable, fine to coarse grained sand matrix, moist.	
35							
						@36' - Brown SANDSTONE with subrounded to subangular gravel and cobbles, friable, moist.	
						@37'4" - Matrix fining to clayey, fine to medium grained SANDSTONE, wet.	
40	21-10"	C		11.9	99.3	@37'10" - Matrix resumes coarseness.	
						@39'8" - Transition to fine gravelly fine to coarse grained SANDSTONE with occasional subrounded cobbles, graded, very dense, light brown, moist.	
						@40' - Light yellowish brown fine to coarse grained SANDSTONE with occasional gravel.	
45							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1696'	DATE: 6/27/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40						@41'5" - Grades subrounded to subangular to fine gravel CONGLOMERATE to coarse gravel CONGLOMERATE with light brown fine to coarse grained sand matrix, well graded, hard, moist.	
45							
50	7-5"	C				@50' - No sample recovered, subangular gravel to cobble CONGLOMERATE, fine to coarse grained sand matrix, moist, possible minor seep at 50-52', coarsens to boulder CONGLOMERATE, matrix is wet, possibly from seep above.	
55							
60	15-5"	C		5.4	100.5	@59'3" - Clast decreasing in coarseness to cobbles (up to 6"), iron staining in matrix and clasts. @60' - Light brown subangular gravel CONGLOMERATE with friable fine to coarse grained sand matrix, moist.	
65							
70	22-12"	C		8.5	109.9	@70' - Dark yellowish brown subangular fine gravel CONGLOMERATE with fine to coarse grained sand matrix, moist, friable, poorly graded, hard. @71' - Light brownish gray subrounded coarse gravel CONGLOMERATE with fine to coarse grained sand matrix, well graded, hard, moist, metamorphic clasts.	
75	16-5"	C				@72' - Seeping. @74' - Greenish gray fine to medium grained SANDSTONE with trace fine gravel, graded, hard, moist. @74'11" - <u>Mint Canyon Formation</u>: Sharp, scoured, irregular contact with subrounded cobble CONGLOMERATE, gray brown fine to coarse grained sand matrix, weakly to moderately cemented, very moist, hard, well graded. @75' - Greenish gray silty fine grained SANDSTONE, poorly graded, hard, moist. @76'8" - Abrupt transition to subrounded cobble CONGLOMERATE with greenish gray fine to coarse sand matrix, very dense, moist, well graded.	@76'8" Approx. contact N35E/8SE
80							
85							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1696'	DATE: 6/27/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
80						@80' - Greenish gray subrounded cobble CONGLOMERATE with silty fine to coarse grained sand matrix, well graded, hard, moist, metamorphic clasts.	
						@83' - Greenish brown subrounded cobble CONGLOMERATE with silty fine to coarse grained sand matrix, well graded, hard, moist, metamorphic clasts.	
85							
						@87'4" - Fine grained gravelly fine to coarse grained SANDSTONE, graded, hard, gray, moist to very moist.	@87'4" B N23W/8SW
	30-10"	C		14.0	104.3	@88' - Light brownish gray silty fine to medium grained SAND with trace subangular fine gravel, graded to well graded, hard, dense, moist, metamorphic clasts.	
90						@88'4" - Scoured contact between subrounded coarse gravel CONGLOMERATE, slightly friable, and silty fine grained SANDSTONE below, poorly graded to graded, hard, gray, moist.	
95						@89' - Gray very silty fine to medium grained SANDSTONE, poorly graded to graded, hard, moist.	
						@92' - Grades to silty fine to coarse grained SAND over fine gravel CONGLOMERATE, over cobble CONGLOMERATE, friable, gray fine to coarse grained sand matrix, hard, wet.	
100							
						@103' - Brown to dark brown cobble CONGLOMERATE with subrounded gravelly fine to coarse grained sand matrix, well graded, hard, moist, metamorphic clasts.	
105	30-5"	C		5.3	87.1	@105' - Gray subrounded to subangular coarse gravel to cobble CONGLOMERATE with friable fine to to coarse grained sand matrix, well graded, hard, moist, metamorphic clasts, in SE wall weakly cemented fine to coarse grained SANDSTONE, graded, hard, gray, moist, truncated by CONGLOMERATE.	
110							
115						@115' - Cobbles coarsening to boulder size.	
120						Total Depth - 116' Minor seep at 50' Seep causing sand to run at 72' Backfilled	
125							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1678'±	DATE: 6/30/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Saugus Formation: Brown coarse grained gravel to cobble CONGLOMERATE with fine to coarse grained sand matrix, well graded, dense, moist, clasts metamorphic and subrounded to subangular, metamorphic clasts, slightly friable, rootlets.	@3.5' C N80W/9NE
						@2' - Pale brown coarse grained gravel CONGLOMERATE with fine to coarse grained sand matrix, well graded, dense, moist, subrounded metamorphic clasts.	
5						@5' - Mottled light yellowish brown, pale brown, and gray green silty fine grained SAND, poorly graded, medium dense, moist, with trace iron staining, to fine grained gravelly silty fine to medium grained SAND, poorly graded, dense, moist.	
10	8	C		12.1	118.0	@7'4" - Grades to very silty fine grained SANDSTONE, poorly graded, very dense, brown, moist.	@10'3" B N64W/8SW
						@9' - Dark brown fine to coarse grained sandy clayey SILT, poorly graded, very stiff, moist, bedded with gray green beds from above.	@14.6" B N41W/12SW
15						@10' - Light yellow brown fine grained gravel CONGLOMERATE with fine to medium grained sand matrix, graded to well graded, dense, moist, subrounded, over interbedded gray green silty fine to coarse grained SAND, graded, dense, moist, and dark brown silty fine to coarse grained SAND, graded, dense, moist.	@18'10" B N86W/11SW
20	10-8"	C		4.0	117.6	@17' - Gray green interbeds, color change to olive and very moist.	
						@18'10" - Subrounded to subangular cobble CONGLOMERATE, well graded, slightly friable, olive silty fine to coarse grained sand matrix, very dense, moist.	
25						@20' - Yellowish brown fine grained gravel CONGLOMERATE with fine to coarse grained sand matrix, well graded, hard, moist, subrounded metamorphic clasts.	
						@21' - Coarsens to cobble CONGLOMERATE.	
						@21.5' - Yellow brown fine to coarse grained SANDSTONE, graded, hard, friable, irregular thickness.	@29'4" C N51E/12SE
30	15-10"	C		4.6	116.6	@22.5' - Subangular coarse grained gravel CONGLOMERATE, friable.	
						@23' - Yellow brown fine to coarse grained SANDSTONE, graded, hard, moist, friable, irregular thickness.	
35						@23.5' - Yellow brown fine to coarse grained gravel CONGLOMERATE with friable fine to coarse grained sand matrix, well graded, hard, moist, subangular metamorphic clasts, occasional cobbles.	
						@29'4" - Yellow brown fine to coarse grained SANDSTONE, graded, hard, moist, friable, contact with above is irregular and scoured.	
40	14-6"	C		6.3	103.0	@32' - Yellowish brown fine grained gravel CONGLOMERATE with fine to coarse grained sand matrix, well graded, hard, moist, subangular metamorphic clasts.	
						@33' - Dark yellowish brown coarse grained gravel CONGLOMERATE with fine to coarse grained sand matrix, well graded, very dense, moist, subrounded metamorphic clasts, also boulder sized pocket of silty fine grained SANDSTONE, poorly graded, dense, brown to yellowish brown, moist, weakly indurated, only in N wall (ripup clast?).	
45							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1678'±	DATE: 6/30/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40						@34'5" - Grades to fine grained gravelly fine to coarse grained SANDSTONE, graded, slightly friable.	
						@35'2" - Dark yellowish brown fine to coarse grained gravel CONGLOMERATE with fine to coarse grained sand matrix and occasional cobbles, subrounded metamorphic clasts.	
45						@40' - Yellowish brown to dark yellowish brown coarse grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, very dense, moist, subrounded metamorphic clasts, also discontinuous lens of brown CLAYSTONE, very stiff, wet, waxy, non-slightly plastic, boulder sized and only in SW wall.	
50						@44' - Several cobbles approach boulder size.	
						@46' - Grades to pale brown fine to coarse grained SANDSTONE with coarse gravel, graded, hard, moist, slightly friable, subangular metamorphic clasts.	
						@47'3" - Pale brown fine to coarse grained gravel to cobble CONGLOMERATE, well graded, hard, moist, subangular metamorphic clasts.	
55							@56'4" C N89W/15NE
	20-6"	C		8.2	113.5	@49' - Yellowish brown to dark yellowish brown cobble CONGLOMERATE with fine to coarse sand matrix, well graded,very dense, moist, subangular to subrounded metamorphic clasts, also boulder sized ripup clast of clayey SILTSTONE in SE wall, poorly graded, very stiff, dark brown, moist, slightly plastic.	@57'5" B N20E/16NW
60						@55' - Occasional boulder sized clasts in CONGLOMERATE.	
						@56'4" - Sharp, erosional contact with pale brown fine to coarse grained SANDSTONE, poorly graded to graded, hard, moist, thinly bedded.	
65						@57'8" - Sharp, irregular, erosional contact with coarse grained gravel to cobble CONGLOMERATE, well graded, pale brown, weakly cemented to cemented fine to coarse grained sand matrix, hard, moist, subangular metamorphic clasts.	
70						@61'7" - Pocket of gravelly fine to coarse grained SANDSTONE, graded, hard, moist, pale brown, slightly friable, only in E wall.	
						@70' - Boulder sized clast.	
						@71'5" - Orange CLAY rind around clasts, soft, moist to wet, highly plastic, approximately 1/2mm thick but same matrix from 57'8" exists, mostly clast supported, very little matrix.	
75							
80							
85							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1678'±	DATE: 6/30/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
80	21-8"	C		7.4	---	Light yellowish brown coarse grained gravel CONGLOMERATE with silty fine to coarse grained sand matrix, well graded, very dense, moist, subrounded metamorphic clasts.	
85							
90							
						Total Depth - 92'	
						No groundwater	
						No caving	
95						Backfilled	
100							
105							
110							
115							
120							
125							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1664'	DATE: 7/7/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Saugus Formation:	
						@3' - Mottled gray green, rusty orange, brown fine to coarse grained gravelly fine to coarse grained SANDSTONE, graded, weakly indurated, very dense, moist, massive, subangular metamorphic clasts, rootlets to 5'.	
5						@5'4" - Grades to fine grained gravel CONGLOMERATE with weakly cemented to slightly friable fine to coarse sand matrix, graded to well graded, very dense, moist.	@6'11" B N48W/85SW
						@5.5' - Dark brown CLAYSTONE, highly plastic, moist.	
10	10	C		14.0	115.2	@6'7" - Grades to fine grained gravel CONGLOMERATE with weakly cemented fine to coarse grained sand matrix, graded to well graded, very dense, moist.	@9'4" B N7W/7SW
						@9'4" - Grades to yellow brown fine to coarse grained gravel CONGLOMERATE, subangular metamorphic clasts, friable in west wall.	@12' B N32W/8SW
						@10' - Brown silty fine to medium grained SANDSTONE, poorly graded, weakly indurated, very dense, moist, subangular metamorphic fine gravels.	
15						@12' - Grades to light yellowish brown fine grained gravel CONGLOMERATE with friable fine to coarse sand matrix, well graded, hard, moist, subangular metamorphic clasts.	@16' B N22W/7SW
						@12'5" - Grades to yellowish brown silty fine grained SANDSTONE, poorly graded graded, weakly indurated, hard, moist, massive.	
20						@13'8" - Grades to pale brown fine to coarse grained SANDSTONE, slightly friable, massive.	@20'3" B N66W/8SW
						@15' - Grades to pale brown fine grained gravel CONGLOMERATE, well graded, friable, hard, moist, subangular metamorphic clasts.	
25						@15.5' - Grades to yellowish brown silty fine grained SANDSTONE, poorly graded to graded, weakly indurated, hard, moist.	
						@16' - Grades to cobble CONGLOMERATE with friable light yellowish brown fine to coarse sand matrix, well graded, hard, moist, subrounded metamorphic clasts.	@26'8" B N9W/8SW
						@18'4" - Grades to yellowish brown silty fine grained SANDSTONE, poorly graded to graded, weakly indurated, hard, moist.	
30						@20'3" - Grades to coarse grained gravel CONGLOMERATE with friable yellow brown fine to coarse sand matrix, well graded, hard, moist, subrounded metamorphic clasts.	
						@22'4" - Grades to yellowish brown silty fine to coarse grained SANDSTONE, graded, weakly indurated to slightly friable, hard, moist.	
35						@23'4" - Grades to yellowish brown fine grained gravel CONGLOMERATE with friable fine to coarse sand matrix, well graded, hard, moist, subrounded metamorphic clasts.	
						@26'8" - Coarsens to coarse grained gravel CONGLOMERATE.	@38'9" B N17W/20SW
40						@26'10" - Grades to yellowish brown fine to coarse grained SANDSTONE, graded, friable, hard, moist.	
						@28'2" - Grades to subrounded fine to coarse grained gravel to cobble CONGLOMERATE, friable.	
						@30' - Yellow brown coarse grained gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist, subrounded metamorphic clasts.	
45							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1664'	DATE: 7/7/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40						@35' - Brown coarse grained gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist, subangular metamorphic clasts.	
						@37'9" - Sharp, irregular, scoured contact with yellowish brown fine to coarse grained SANDSTONE, graded, friable, hard, moist.	
						@38'9" - Grades to coarse grained subangular gravel CONGLOMERATE, friable.	
45						@38'11 - Sharp, irregular, scoured contact with yellowish brown fine to coarse grained SANDSTONE, graded, hard, moist, friable.	
						@40' - Grades to cobble CONGLOMERATE with friable yellowish brown fine to coarse sand matrix, graded, hard, moist, subangular metamorphic clasts.	
						@41' - Pale yellowish brown fine grained subangular gravelly fine to coarse grained SANDSTONE, graded, hard, moist.	
50						@42' - Fines to fine to coarse grained gravel CONGLOMERATE.	
						@45' - Yellow brown coarse grained gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist, clasts subangular to subrounded metamorphics.	@52' B N63W/12SW
55						@45.5' - Matrix color grades to very pale brown, approx. 50% of conglomerate is matrix material, most clasts subangular fine gravel, occasional cobbles, hard, moist, friable to slightly friable.	
						@47' - Moisture increases to very moist, subangular cobble clasts.	
						@53' - Grades to brown coarse grained gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, hard, very moist, clasts subangular to subrounded metamorphics.	
60	22-10"	C		16.1	113.2		
						@55'2" - Matrix color grades to very pale brown, approx. 50% of conglomerate is matrix material, most clasts subangular fine gravel size, occasional cobbles, hard, moist, friable to slightly friable, massive.	@62'1" C N2E/11NW
							@64'11" C N2E/14NW
65						@59' - Orange highly plastic CLAYSTONE, appears in matrix surrounding clasts.	
						@61' - Brownish yellow fine grained gravelly slightly plastic clayey fine to medium grained SANDSTONE, poorly graded, very dense, moist, gravels subrounded to subangular metamorphics, overlying mottled brownish yellow and gray silty fine grained SANDSTONE, poorly graded to graded, dense, moist.	@65'8" B N11W/16SW
70						@62'1" - Sharp, irregular contact along a 1mm thick highly plastic CLAYSTONE bed, soft, moist, light brown to brown, overlying dark yellowish brown silty fine grained SANDSTONE, poorly graded, weakly indurated, hard, moist, thinly bedded.	@71' B N34W/4SW
						@63' - Light gray silty fine grained SANDSTONE, poorly graded, weakly to moderately indurated, hard, moist.	
75						@64'11" - Contact between dark yellowish brown and gray silty fine grained SANDSTONE.	
						@65'3" - Grades back to dark yellowish brown.	
						@67.5' - Contact with gray silty fine grained SANDSTONE.	
						@68' - Color change to mottled gray and dark yellowish brown.	
80						@69' - Mottled gray and yellowish brown to dark yellowish brown silty fine grained SANDSTONE, poorly graded, hard, moist.	
						Total Depth - 76', Seep from 56-58', No caving, Backfilled	
85							

ADDITIONAL COMMENTS: Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 50', 2280 lbs.
50- 75', 1200 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1684'	DATE: 7/11/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Saugus Formation: Very pale brown silty fine to coarse grained gravelly fine to coarse grained SANDSTONE, graded, hard, dry, gravel clasts are subangular.	
						@2' - 4" thick fine grained gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist, rootlets, clasts are subangular and metamorphic.	@2' B N52W/14SW
5						@2'4" - Mottled yellowish brown and gray green fine grained gravelly silty fine to coarse grained SANDSTONE, graded, hard, moist, gravels are subangular, end of rootlets, massive.	@6' B N48W/6SW
						@3'3" - Absence of gray green color.	
						@5' - Dark yellowish brown and mottled olive gray clayey silty fine to medium	
10	7	C		12.7	121.7	grained SANDSTONE, graded, hard, moist.	
						@6' - Grades to yellowish brown fine to coarse grained gravel CONGLOMERATE with friable fine to coarse sand matrix, well graded, hard, moist, clasts are subrounded and metamorphic.	@11'10" B N25W/5NW
						@9' - Sharp, scoured contact with 12" thick section of interbedded yellowish brown	
15						and gray green fine grained sandy SILTSTONE, poorly graded, hard, moist, interbeds approximately 1.5" thick.	
						@10' - Yellowish brown thinly bedded SILTSTONE.	
						@11'10" - Grades to reddish brown clayey silty fine to coarse grained SANDSTONE with fine gravel, graded, hard, moist.	
20	11-10"	C		8.6	115.2	@12'5" - Grades to coarse grained gravel to cobble CONGLOMERATE with friable yellow brown fine to coarse sand matrix, well graded, hard, moist, clasts are subrounded and metamorphic.	@20' B N37W/6SW
						@13'5" - Matrix color changes to pale brown.	
						@14.5' - Matrix occasionally turns reddish brown for 2", then back to pale brown.	
25						@17'10" - Sharp, irregular scoured contact with dark yellowish brown fine grained gravelly silty fine to medium grained SANDSTONE, graded, weakly indurated, hard, moist, massive.	
						@20' - Grades to yellowish brown coarse grained gravel to cobble CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, hard, moist, occasional	
30	19-8"	C		8.7	120.9	cobbles, clasts are subrounded and metamorphic.	
						@22' - Scoured contact with dark yellowish brown silty fine to coarse grained SANDSTONE, graded, hard, moist, thickly bedded.	
						@23'7" - Grades to yellowish brown fine to coarse grained gravel CONGLOMERATE.	
						@23'11" - Yellow brown silty fine grained gravelly fine to coarse grained	
35						SANDSTONE, slightly friable, graded, hard, moist, massive.	@35' B N52W/7SW
						@25'1" - Grades to yellow brown coarse grained gravel to cobble CONGLOMERATE, friable to slightly friable, well graded,hard, moist, clasts are subrounded and metamorphic.	
						@30' - Grades to yellowish brown coarse grained gravel to cobble	
40						CONGLOMERATE with fine to coarse sand matrix, well graded, slightly friable to friable, hard, moist, occasional cobbles, clasts are subrounded and metamorphic.	
						@31' - 1" thick discontinuous brown clayey silty SAND, poorly graded, stiff, moist, 90° around hole in SE quadrant.	
						@31'5" - Occasional boulders begin appearing in conglomerate for remainder of boring.	
45						@35' - Matrix coarsens and becomes friable.	

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1684'	DATE: 7/11/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@42' - Grades to fine grained gravel CONGLOMERATE.	
						@44' - Grades to coarse grained gravel to cobble CONGLOMERATE.	
45						@44'5" - Boulder sized pocket of brown silty fine grained SANDSTONE, poorly graded, dense, moist, thinly bedded, occurs in south wall.	
						@47' - Yellowish brown fine grained gravelly fine to coarse grained SANDSTONE, graded, slightly friable, hard, moist, massive.	
						@49' - Very pale brown fine grained gravelly fine to coarse grained SANDSTONE, friable, graded, hard, very moist.	
50						@51' - Grades to yellowish brown fine grained gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, hard, moist, subangular metamorphic clasts.	
55						@55' - Grades to cobble CONGLOMERATE.	
						@56'5" - Grades to subrounded fine grained gravel CONGLOMERATE.	
60	22-10"	C		8.5	99.3	@60' - Yellowish brown fine to coarse grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist, subangular metamoprhic clasts, orange highly plastic clay in matrix around clasts.	
						@60.5' - Matrix color changes to very dark brownish black.	
						@64' - Matrix color changes back to pale yellowish brown.	
65							
70						@70' - Yellow brown subangular fine to coarse grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist.	
75						@75' - Yellow brown subangular fine to coarse grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist.	
							@77' B N20W/12NW
80						@80' - Yellow brown subangular fine to coarse grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist.	
						Total Depth - 80'	
						No groundwater, No caving	
85						Backfilled	

ADDITIONAL COMMENTS:
Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1998'	DATE: 7/12/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Saugus Formation: Brown fine grained gravelly fine to coarse grained SANDSTONE, graded, slightly friable, dense, moist.	
						@3' - Color change to yellow brown fine to coarse grained gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist, clasts are subrounded and metamorphic.	@3' B N58E/24NW
5						@5' - Reddish yellow silty fine to medium grained sandy SILTSTONE, weakly indurated, poorly graded, very stiff, moist.	
						@9'9" - Grades to channelled gravels, 2" thick, rootlets.	@9'9" B N69E/14NW
10	7	C		12.6	118.3	@10' - Dark yellowish brown clayey silty fine to medium grained SANDSTONE, weakly indurated, hard, moist, occasional white streaks.	@11.5' B N79E/26NW
						@11.5' - Grades to fine to coarse grained gravel CONGLOMERATE with slightly friable coarse sand matrix, well graded, hard, moist, clasts are subrounded and metamorphic.	
15						@13' - Yellowish brown fine grained gravelly fine to coarse grained SANDSTONE with occasional coarse gravel, graded, slightly friable, hard, moist, massive, occasional gravel beds.	@16' B N49E/23NW
						@16' - Coarse gravel bed.	
20	4	C		10.4	116.7	@20' - Grades to fine grained gravel CONGLOMERATE with pale brown fine to coarse sand matrix, well graded, hard, moist.	@21'3" C N31E/27NW
						@21'3" - Sharp, scoured contact along bedding, yellow brown clayey silty fine grained SANDSTONE, poorly graded, hard, moist, slightly plastic.	@21'9" B N38E/22NW
						@21'9" - 1/4" thick clay bed.	
25						@23' - Yellowish brown clayey fine to coarse grained SANDSTONE, occasional coarse gravel, graded, hard, moist.	
						@24'4" - 6" thick discontinuous yellow brown clayey silty fine grained SANDSTONE, poorly graded, slightly plastic, hard, moist.	
30	9	C		12.2	114.9	@25' - Grades to coarse grained gravel to cobble CONGLOMERATE, slightly friable.	
						@30' - Light yellowish brown coarse grained gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist.	@31'7" B N65E/31NW
						@31'7" - Yellowish brown fine to coarse grained SANDSTONE, graded, slightly friable, hard, moist, poorly bedded.	
35						@34'4" - Grades to subrounded fine grained gravel to cobble CONGLOMERATE, slightly friable.	
40	15	C		13.9	119.9	@39' - Yellowish brown coarse grained gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, hard, very moist, clasts are subrounded and metamporhic.	@41'10" B N29E/24NW
						@40' - Matrix becomes slightly plastic clayey fine grained SAND.	
45							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1998'	DATE: 7/12/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@43' - Moisture increases to wet.	
						@44' - Seep within cobble CONGLOMERATE.	
45							
						@47' Sharp, irregular, nonsheared contact with brown CLAYSTONE, very stiff, wet, pervasively sheared, corn flaky texture.	@47' C N49E/26NW
	13		C	12.1	119.8	@47.5' - 6" thick conglomeratic SANDSTONE interbed truncated by shear below.	@47'3" S N49E/29NW
50						@48' - Brown CLAYSTONE, very stiff, wet, pervasively sheared, corn flaky texture, medium plastic.	@48' S N50W/43SW
						@49' - Brown fine grained sandy clayey SILTSTONE, poorly graded, stiff, moist, with sheared, waxy slickensided clay bed, overlying yellow brown subangular fine grained gravel CONGLOMERATE with clayey fine to coarse grained sand matrix, well graded, hard, very moist to wet.	@51' S N43E/37NW
55						@50' - Brown to dark brown fine to medium grained sandy silty CLAYSTONE, poorly graded, hard, moist.	
						@51' - Shear in claystone with slickensides (34°, N54W), NW dipping shears are dominant as they truncate SW dipping shear at 48'.	
60	14		C	10.4	119.1	@54' - Highly plastic CLAYSTONE, brown to dark brown, moist, very stiff.	
						@57' - Brown to dark brown very clayey fine to medium grained SANDSTONE, graded, hard, moist, slightly to medium plastic.	
						@59' - Dark yellowish brown clayey silty fine to medium grained SANDSTONE, graded, hard, moist.	
65						@60' - Yellowish brown fine grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, hard, wet, clasts are subrounded and metamorphic.	
						@63' - Dark yellowish brown clayey fine to medium grained SANDSTONE, graded, hard, moist, slightly plastic.	
70	21		C	12.1	125.0	@70' - Brown silty fine to medium grained SANDSTONE, graded, hard, moist.	
75						@75' - Yellowish brown fine grained gravelly fine to coarse grained SANDSTONE, graded, hard, moist.	
80	22-10"		C	14.5	117.7	@80' - Grades to yellowish brown subrounded to rounded fine grained gravel CONGLOMERATE with clayey fine to coarse grained sand matrix, well graded, hard, to contact with brown clayey silty fine to medium grained SANDSTONE, graded, hard, moist.	
85							

ADDITIONAL COMMENTS: Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1998'	DATE: 7/12/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
80							
						@82' Brown clayey fine to medium grained SANDSTONE, graded, hard, wet, medium to highly plastic.	
85							
						@87' - Brown to yellowish brown fine to coarse grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist, subrounded metamorphic clasts.	
90	26-10"	C		16.7	106.7	@90' - Dark yellow brown fine grained sandy clayey SILTSTONE, poorly graded, hard, moist.	
						@92' - Dark yellowish brown clayey silty fine to medium grained SANDSTONE, graded, hard, moist.	
95							
						@98' - Dark yellowish brown clayey silty fine grained subrounded to subangular gravelly fine to coarse grained SANDSTONE, well graded, hard, moist, clasts are	
100	30-10"	C		4.9	106.9	subrounded and metamorphic.	
						@100' - Light yellowish brown fine to coarse grained gravel CONGLOMERATE with friable fine to coarse sand matrix, well graded, hard, moist, clasts are subrounded and metamorphic.	
						@101' - Color change to dark yellowish brown.	
105						@104' - Abundant cobbles.	
						@105' - Moisture increase to very moist, matrix coarsens to fine to coarse grained sandy fine grained gravel.	
						@106' - Seep.	
						@109' - Yellowish red subrounded cobble CONGLOMERATE with weakly cemented	
110						clayey fine to coarse sand matrix, well graded, hard, moist, clasts are subrounded.	
						@110' - Yellowish brown fine grained gravel CONGLOMERATE with weakly cemented clayey fine to coarse sand matrix, well graded, hard, moist, low to medium plastic matrix, clasts are subrounded and metamorphic.	
115							
120						Total Depth - 115'	
						Seeps at 44'-54' and 106'	
						Caving at 51'-53'	
						Backfilled	
125							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2165'	DATE: 7/14/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Saugus Formation: Dark brown clayey silty fine to coarse grained SANDSTONE, graded, dense, moist, rootlets.	
						@2' - Light yellowish brown fine to coarse grained gravelly silty fine grained SANDSTONE, poorly graded, dense, moist, weakly cemented, clasts are subangular.	
5						@5'5" - Grades to fine to coarse grained gravel CONGLOMERATE with friable fine to coarse sand matrix, well graded, dense, moist, abundant rootlets.	@5'5" Approx. BN79E/10NW
						@7.5' - Irregular, scoured contact with brown clayey silty fine to medium grained SANDSTONE, graded, dense, moist, weakly indurated.	
						@8' - Color change to yellowish brown.	
10	4	C		13.0	110.8		
						@11' - Grades to yellowish brown fine grained gravel CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, hard, moist.	@12'2" Approx. BN58E/11NW
						@11.5' - Irregular, scoured contact with brown clayey silty fine to medium grained SANDSTONE, graded, dense, moist, weakly indurated.	
15						@12'2" - Grades to yellowish brown fine to coarse grained gravel CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, hard, moist.	@15'11" B + S Horizontal
						@15'11" - 2" thick brown claystone bed, stiff, moist, medium to highly plastic, waxy, corn flaky texture, internally sheared.	
						@19' - Very pale brown fine grained gravelly fine to coarse grained SANDSTONE,	@19' Approx.
20	4	C		9.8	117.2	poorly graded to graded, hard, moist, friable.	BN55E/14NW
						@20'7" - Dark yellowish brown fine grained gravelly clayey silty fine grained SANDSTONE, graded, hard, moist, subrounded gravels, massive, weakly indurated, occasional discontinuous fine to coarse sandstone channels.	@20'7" C N84E/13SE
25							
						@29' - Yellowish brown fine grained gravelly fine to coarse grained SANDSTONE,	@29'8" Approx.
30	13	C		4.4	110.8	graded, hard, moist, gravels are subangular.	BN69W/12SW
						@29'8" - Grades to yellowish brown subrounded fine to coarse grained gravel CONGLOMERATE with with slightly friable fine to coarse sand matrix, well graded, moist.	@30'10" B N56W/5SW
						@30'10" - Material becomes thinly bedded with cross bedding.	
35						@31'7" - Matrix becomes clayey.	@35'2" Approx.
						@33'4" - Clayey silty fine grained SANDSTONE, poorly graded.	CN37W/2SW
						@34'3" - Grades to fine grained gravel CONGLOMERATE.	@35'3" S
						@35'2" - Sharp, scoured contact with 8" thick brown CLAYSTONE, stiff, moist, highly plastic, internally sheared, corn flaky texture, waxy.	N37W/2SW
40	20	C		9.1	120.4	@35'10" - Clayey silty fine to medium grained SANDSTONE, massive, weakly indurated, slightly plastic, occasional subangular fine gravel.	
						@38' - Loose clay in matrix.	
						@40' - Dark yellowish brown fine grained gravelly clayey silty fine to coarse grained SANDSTONE, graded, hard, moist.	
45							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2165'	DATE: 7/14/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@43' - Discontinuous fine grained gravel channel deposit.	
45							
						@46' - Grades to subrounded coarse grained gravel to cobble CONGLOMERATE, weakly cemented, hard, moist.	@46' Approx. BN9W/8SW
						@48.5' - Pale yellowish brown subrounded fine to coarse grained gravel CONGLOMERATE with weakly cemented fine to coarse sand matrix, well graded,	@48.5' Approx. BN2W/7SW
50	20	C		2.7	118.6	hard, moist.	@50'4" B N56W/10SW
						@50' - Light gray subangular fine to coarse grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist, thinly bedded with cross bedding.	@52' B N56W/9SW
						@51' - 1' thick dark grayish brown to grayish brown subangular fine to coarse grained gravelly fine to coarse grained SANDSTONE, graded, hard, moist.	
55						@54' - Yellowish brown fine grained subangular to angular gravelly fine to coarse grained SANDSTONE, graded, hard, moist.	
						@55.5' - Grades to coarse grained gravel CONGLOMERATE.	
						@56'1" - Reddish brown to yellowish red fine grained gravelly clayey fine to coarse grained SANDSTONE, well graded, hard, moist, slightly plastic, clasts are subrounded.	@59' Approx. C Horizontal
60						@59' - Sharp, irregular scoured contact with fine to coarse grained sandy CLAYSTONE, graded, very stiff, moist, slightly plastic.	
						@60'4" - Grades to yellowish brown subrounded fine grained gravel to cobble	
	19	C		9.2	121.7	CONGLOMERATE with fine to coarse sand matrix, graded, hard, moist.	
						@63'9" - Brownish yellow clayey fine to coarse grained SANDSTONE, graded, hard, very moist, slightly plastic, weakly indurated.	
65						@65.5' - Grades to light brownish gray subrounded to subangular coarse grained gravel to cobble CONGLOMERATE with weakly cemented fine to coarse sand matrix, graded, hard, moist.	
						@66'7" - Matrix color changes to pale brown.	
70						@68' - Yellowish brown subrounded to subangular coarse grained gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist, slightly	
	25-10"	C		8.3	105.6	plastic.	
						@69' - Grades to light brownish subrounded to subangular gray coarse grained gravel to cobble CONGLOMERATE with weakly cemented fine to coarse silty sand	
75						matrix, graded, hard, moist.	
						@70' - Pale brown subrounded fine grained gravel to cobble CONGLOMERATE with fine to coarse sand matrix, graded, hard, moist.	
						@72' - Color change to pale yellow.	
80						Total Depth - 72'	
						No groundwater	
						No caving	
						Backfilled	
85							

ADDITIONAL COMMENTS: Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1978'	DATE: 7/17/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Artificial Fill: Brown silty fine to medium grained SAND, poorly graded, medium dense, dry, pieces of grass.	
						@1' - Saugus Formation: Brown fine grained gravelly clayey silty fine to coarse grained SANDSTONE, well graded, very dense, moist, subangular gravels, weakly cemented, rootlets.	
5						@3.5' - Yellowish brown fine grained gravelly clayey silty fine to medium grained SANDSTONE, graded, dense, moist, slightly friable, rootlets.	
						@3'10" - 6" thick blue gray cementation, pervasive white carbonate veins.	
						@6' - Some coarse gravels.	@8' Approx. B N4E/17NW
						@8' - 1-6" thick dark yellowish brown channel deposit: fine to coarse grained	
10	5	C	X	16.7	111.7	gravel CONGLOMERATE with slightly friable fine to coarse grained sandstone matrix, well graded, dense, moist, subrounded to subangular clasts.	@10'7" B N24E/15NW
						@8'1" - Brown fine grained gravelly silty fine grained SANDSTONE to fine grained sandy SILTSTONE, poorly graded, hard, moist.	
						@10' - Grades to subrounded fine grained gravel CONGLOMERATE with weakly	
15						cemented sand matrix, well graded, hard, moist.	
						@10'7" - abrupt, irregular contact to 3" thick brown silty CLAYSTONE, very stiff, moist, corn flaky texture, waxy, grades to fine grained sandy clayey SILTSTONE.	
						@12'7" - Yelowish brown fine to medium grained sandy silty CLAYSTONE,	@19' Approx.
20	9-9"	C		7.8	115.3	poorly graded, slightly to medium plastic, moist, very stiff, white carbonate cemented veins at random orientations.	BN4W/11SW
						@13'4" - Grades to brown silty SANDSTONE to sandy SILTSTONE.	
						@14'7" - Grades to yellowish brown subrounded cobble CONGLOMERATE with clayey silty fine to coarse sand matrix, well graded, moist, slightly	
25						friable to weakly cemented.	
						@19' - Fine grained gravel CONGLOMERATE bed with slightly friable to friable fine to coarse sand matrix, graded, hard, scoured.	
						@20' - Clasts coarsen to coarse grained gravel.	
						@25' - Grades to cobble CONGLOMERATE.	
30						@29' - Grades to cobble to boulder CONGLOMERATE.	
						@30' - Color change to dark yellowish brown.	
						@31' - Yellowish brown cobble to boulder CONGLOMERATE, slightly friable fine to coarse sand matrix, graded, hard, moist.	
35						@35' - Fine grained gravel interbed.	@35' Approx. BN12E/13NW
40	9-6"	C		7.1	89.1	@40' - Yellowish brown subrounded cobble CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist, black carbonate cemented gravels.	@40' Approx. BN38E/2NW
45							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1978'	DATE: 7/17/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
45						@45' - Yellowish brown fine grained gravelly silty fine to coarse grained SANDSTONE, graded to well graded, hard, moist, slightly friable, clasts are subangular.	@45' Approx. BN50E/9NW
						@48'8" - Abrupt contact with very pale brown silty fine to coarse grained SANDSTONE with clay and subangular to subrounded fine gravel clasts,	@48'8" C N9E/27NW
50	21-10"	C		8.3	119.1	well graded, weakly indurated, hard, moist.	
						@49' - Very pale brown fine grained gravelly fine to coarse grained SANDSTONE, graded, hard, moist, clasts are subrounded.	
						@50' - Very pale brown subangular fine grained gravel CONGLOMERATE with clayey silty fine to coarse sandstone matrix, well graded, hard, moist.	
55						@51' - Grades to very pale brown subangular to subrounded coarse grained gravel to cobble CONGLOMERATE, well graded, hard, moist, weakly cemented.	
						@54' - Color change to dark yellowish brown, moisture to very moist.	
						@56' - Color change to light yellowish brown, moist.	
60	17-9"	C				@61' - Color change to light olive brown.	
65						@65' - Mint Canyon Formation: Sharp, irregular, scoured contact with gray silty fine grained SANDSTONE, poorly graded, hard, moist, moderately indurated.	@65' Approx. CN24W/6SW
						@67'10" - Irregular contact with subangular to subrounded coarse grained gravel to cobble CONGLOMERATE with slightly friable to weakly cemented	@67'4" B N2W/14SW @67'10" C
70						clayey silty fine to coarse sand matrix, well graded, hard, moist.	N60W/15NE
75						Total Depth - 72' No groundwater No caving Backfilled	
80							
85							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler
Kelly Bar Weights: 0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.

CLIENT: Pardee	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1806'	DATE: 7/18/06
RIG TYPE: HQ Core	HAMMER WEIGHTS: N/A	DROP: N/A

	Depth (for Recovery/RQD)	Recovery/Core Barrel (inches)	% Recovery	Length Rx > 4" (inches)	RQD % Total 4"/Core	DESCRIPTION	ATTITUDES
0						Saugus Formation; 0 - 30 feet, advanced with Tricone-bit. See log of Boring B6 (1995) for lithology from 0-30 feet.	
5							
10							
15							
20							
						@22' - Brown silty fine to medium grained SANDSTONE, well graded.	
25							
						@27' - Brown clayey fine to coarse grained SANDSTONE, with subangular to subrounded quartz and granitic fine gravels, well graded.	
						@29' - Brown silty fine to coarse grained SANDSTONE, well graded.	
30	@30'	12/30	40	0/30	0	@30' - Began coring.	
						@30' - Gravel CONGLOMERATE, friable brown clayey sand matrix,	
	@32.5'	9/30	30	0/30	0	low plasticity, moist.	
						@30.5' - Brown sandy CLAYSTONE, medium plastic, overlying brown friable fine grained SANDSTONE with subangular to subrounded fine	
35	@35'	12/30	40	4/30	13	gravel, well graded, moist.	
						@32.5' - Subangular to subrounded cobble CONGLOMERATE, clasts	
	@37.5'	8/30	26	7/30	23	commonly granite, quartzite, and andesite. Matrix is friable tan coarse grained sand.	
40	@40'	24/30	80	0/30	0	@40' - Subangular to subrounded gravel CONGLOMERATE, clasts commonly granite and quartzite. Matrix is friable fine to coarse grained sand.	
45							

ADDITIONAL COMMENTS: True dip inclinations determined by core measurement with protractor

CLIENT: Pardee	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1806'	DATE: 7/18/06
RIG TYPE: HQ Core	HAMMER WEIGHTS: N/A	DROP: N/A

	Depth (for Recovery/RQD)	Recovery/Core Barrel (inches)	% Recovery	Length Rx > 4" (inches)	RQD % Total 4"/Core	DESCRIPTION	ATTITUDES
40						@42.5' - Subangular to subrounded fine gravel to cobble CONGLOMERATE, with light brown medium to coarse grained sand matrix.	
						@45' - Mint Canyon Formation: Subrounded gravel to cobble CONGLOMERATE clasts commonly andesite and granodiorite. Matrix is friable light greenish gray medium to coarse grained sand, moist.	
45						@47.5' - Light brown silty SANDSTONE, poorly graded, hard, moist grading to fine to coarse gravel to cobble CONGLOMERATE, hard, moist	
50						@50' - Fine to coarse gravel CONGLOMERATE approx. 3" thick, light gray.	@49.5' True dip =45°
	@42.5'	20/30	67	4/30	13	@53.5' - Sharp contact to cobble CONGLOMERATE	
	@45'	28/30	93	0/30	0	@54' - Sharp contact to friable medium grained SANDSTONE with fine to coarse gravel (clasts commonly andesite and diorite), hard, moist.	
55						@55' - Occasional cobble clast. Sharp contact to CONGLOMERATE below.	
	@47.5'	27/30	90	4/30	30	@55.5' - Fine to coarse gravel CONGLOMERATE, well graded, friable greenish gray medium to coarse grained sand matrix, hard, moist.	
	@50'	28/30	93	6/30	20	@57' - Dark reddish brown silty CLAYSTONE, medium plastic, in tip of core barrel (less than 1/4" thick).	
60	@53'	6/24	25	0/24	0	@57'4" - Tan medium to coarse grained SANDSTONE, well graded, hard, moist hard, moist.	
	@55'	17/24	71	0/24	0	@57'8" - Gabbro cobble, dark gray to black, sharp basal contact.	
	@57'	31/36	86	6/36	17	@59'4" - Subangular to subrounded gravel CONGLOMERATE (approximately 30% gravel clasts). Matrix is fine to coarse sand.	
65							
	@60'	57/60	95	38/60	63	@60' - Medium grained SANDSTONE with approximately 15% subangular to subrounded fine gravel clasts, hard, moist.	@67.5' True Dip = 10°
	@65	58/60	97	30/60	50	@62' - Grades to fine grained SANDSTONE, hard, moist.	
70	@70'	57/60	8	45/60	75	@62'2" - Greenish gray silty CLAYSTONE, medium plastic, stiff, moist. Slickensides.	
						@62'10" - Fine grained SANDSTONE with occassional subrounded gravel, friable, hard, moist.	
75	@75'	50/54	93	29/54	54	@65' - Fine to coarse grained gravel CONGLOMERATE, weakly cemented olive brown medium to coarse grained sand matrix, hard, moist.	
						@70' - Fine grained gravel to cobble CONGLOMERATE with friable olive brown fine to coarse grained sand matrix, hard, moist.	
80							
						@75' - Subangular to subrounded fine to coarse gravel CONGLOMERATE, slightly friable dark brown (mottled tan) medium grained sand matrix, hard, moist. Overlying coarse grained SANDSTONE.	
85							

ADDITIONAL COMMENTS:

CLIENT: Pardee	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1806'	DATE: 7/19/06
RIG TYPE:	HAMMER WEIGHTS: N/A	DROP: N/A

	Depth (for Recovery/RQD)	Recovery/Core Barrel (inches)	% Recovery	Length Rx > 4" (inches)	RQD % Total 4"/Core	DESCRIPTION	ATTITUDES
80						@79.5' - Light olive gray fine grained SANDSTONE with fine gravel, hard, moist.	
						@82' - Granodiorite cobble, porphyritic.	
						@82'8" - Light gray medium to coarse grained SANDSTONE, with occasional fine to coarse gravel clasts of gabbro and diorite, slightly friable, hard, moist.	
85						@85' - Light gray fine to coarse grained SANDSTONE with fine gravel, poorly graded, slightly friable, hard, moist. Occasional granodiorite cobble clast.	
						@87.5' - Sharp contact with fine to coarse grained SANDSTONE with fine gravel clasts of rhyolite and diorite, poorly graded, slightly friable, hard, moist.	
90						@89.5' - Granodiorite cobble, porphyritic, light gray, 4" diameter.	@90.5' True dip = 15°
	@79.5'	30/30	100	15/30	50	@90' - Brown medium to coarse grained SANDSTONE with subrounded coarse gravel, poorly graded, slightly friable, hard, moist.	@91' True dip = 10°
	@82'	29/36	81	10/30	33	@92' - Light gray medium to coarse grained SANDSTONE with subangular to subrounded fine to coarse gravel, well graded, slightly friable, hard, moist.	
95							
	@85'	28/30	93	15/30	50	@95' - Fine gravel to cobble CONGLOMERATE, weakly cemented light greenish gray fine to coarse sand matrix, well graded, hard, moist.	
	@87.5'	26/30	87	6/30	20	@97' - Light gray fine to coarse grained SANDSTONE with fine gravel to cobble clasts, well graded, slightly friable, hard, moist.	
100	@90'	50/60	83	25/60	42	@100' - Granodiorite gravel (2.5" diameter), gravel clasts are subangular.	
	@95'	24/24	100	12/24	50	@103' - Medium to coarse grained SANDSTONE with subangular fine gravel clasts, well graded, friable, hard, moist.	
	@97'	27/36	75	24/36	67	@105' - Light gray fine to medium grained SANDSTONE, well graded, weakly indurated, hard, moist.	@103' True dip = 20°
105						@105'4" - Light gray fine to coarse gravel CONGLOMERATE, slightly friable light gray fine to coarse sand matrix, well graded, hard, moist.	@104' True dip = 14°
	@100'	19/24	58	8/24	33	To fining upward sequences of gravel CG to coarse SS.	@105' True dip = 15°
	@102'	36/36	100	29/36	81	@107' - 1/8" diameter clay ripup clasts, slightly plastic, medium stiff,	
110	@105'	46/54	85	14/54	26	@109.5' - Occasional granitic cobble clast within fine to coarse SANDSTONE to gravel CONGLOMERATE.	
	@109.5	26/36	72	11/36	31	@111' - Fine gravel CONGLOMERATE, grading downward to fine to coarse grained SANDSTONE with fine gravel clasts, well graded, friable, hard, moist.	
	@112.5	14/30	46	0/30	0		
115							
	@115'	24/30	80	0/30	0	@112.5' - Fine to coarse grained SANDSTONE, poorly graded, slightly friable, hard, moist.	
						@115' - Fine gravel to cobble CONGLOMERATE, well graded, hard, moist.	@119.4' True dip = 11°
120							@121' True dip = 15°
							@123' True dip = 18°
125							

ADDITIONAL COMMENTS:

CLIENT: Pardee	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1806'	DATE: 7/19/06
RIG TYPE: HQ Core	HAMMER WEIGHTS: N/A	DROP: N/A

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
	Depth (for Recovery/RQD)	Recovery/Core Barrel (inches)	% Recovery	Length Rx > 4" (inches)	RQD % Total 4"/Core		
120						@117.5' - Cobble CONGLOMERATE, weakly indurated greenish gray fine to coarse grained sand matrix, well graded, hard, moist. Grades to medium to coarse grained SANDSTONE with fine gravel, poorly graded, hard, moist.	
125						@120' - Light gray fine to coarse grained SANDSTONE with fine gravel, poorly graded, mod indurated, hard, moist. To light olive brown fine to coarse grained SANDSTONE with subrounded fine gravel, poorly graded, weakly indurated, hard, moist. 1/8 inch thick CLAY, slightly plastic, stiff, moist.	
130						@125' - Fine to coarse gravel CONGLOMERATE, weakly cemented light gray fine to coarse sand matrix, well graded, hard, moist.	@128.5' True dip = 18°
						@127' - Light gray fine to coarse grained SANDSTONE, well graded, weakly indurated, hard, moist.	
	@117.5'	29/30	97	4/30	13		
	@120'	52/60	87	39/60	65		
135						@135' - Fine gravel to cobble CONGLOMERATE, poorly graded, weakly cemented light gray fine to coarse sand matrix, hard, moist.	
	@125'	24/24	100	17/24	71		
	@127'	24/36	67	13/36	36		
140	@130'	18/44	41	19/44	42	@140' - Fine to coarse gravel CONGLOMERATE, weakly cemented light gray fine to coarse sand matrix, poorly graded, hard, moist. Sharp contact with light gray fine to coarse grained SANDSTONE with gravel, poorly graded, moderately indurated, hard moist.	@139' True dip = 16°
	@133.5'	14/18	78	0/18	0		
	@135'	39/42	93	22/42	52		
145						@145' - Light gray medium to coarse grained SANDSTONE, hard, moist. 12 inch thick interbed of weakly cemented gravel to cobble CONGLOMERATE. To olive gray medium to coarse grained SANDSTONE, hard, moist.	
	@138.5'	14/18	78	0/18	0		
	@140'	58/60	97	40/60	67	@148' - Fine to coarse gravel CONGLOMERATE, weakly cemented light greenish gray sand matrix, hard, moist.	
150	@145'	53/60	88	38/60	63	@150' - Light greenish gray medium grained SANDSTONE, poorly graded, hard, moist. 12 inch thick fine to coarse gravel CONGLOMERATE, moderately cemented medium grained sand matrix.	@150.5' True dip = 9°
	@150'	58/60	97	36/60	60		
	@155'	31/36	86	12/36	33	@152' - Sharp contact with light gray fine to medium grained SANDSTONE, poorly graded, hard, moist, massive.	@153' True dip = 13°
155							
	@158'	22/24	92	22/24	92	@155' - Light gray medium to coarse grained SANDSTONE to coarse gravel CONGLOMERATE, weakly cemented sand matrix, hard, moist.	
160						@158' - Fine to coarse grained gravel CONGLOMERATE with moderately cemented light greenish gray sand matrix, well graded, hard, moist.	
165							

ADDITIONAL COMMENTS:

CLIENT: Pardee	PROJECT: Skyline Ranch	W.O.: 8838
LOCATION: Santa Clarita	ELEVATION: 1806'	DATE: 7/19/06
RIG TYPE: HQ Core	HAMMER WEIGHTS: N/A	DROP: N/A

	N (Depth (for Recovery/RQD))	U (Recovery/Core Barrel (inches))	B (% Recovery)	M (Length Rx > 4" (inches))	DD (RQD % Total 4"/Core)	DESCRIPTION	ATTITUDES
160						@160' - Fine gravel to cobble CONGLOMERATE, moderately cemented light greenish gray fine to coarse sand matrix, well graded, hard, moist.	
165						@165' - Fine gravel to cobble CONGLOMERATE, weakly cemented light greenish gray fine to coarse sand matrix, well graded, hard, moist.	
170						@170' - Olive gray fine to coarse grained SANDSTONE with gravel, well graded, hard, moist. To olive brown CLAY with silt and fine gravel, slightly plastic, very stiff, moist.	@170.8' Horizontal bedding
	@160'	18/24	75	10/24	41		
	@162'	29/36	81	20/36	55	@173.5' - Olive brown clayey SILTSTONE, medium plastic, very stiff, moist.	
175						@175' - Olive brown silty CLAYSTONE, medium plastic, very stiff, moist.	
	@165'	47/60	78	29/60	48		
	@170	9/12	75	0/12	0		
180	@173.5	18/18	100	18/18	100	@179' - Gray medium to coarse grained Sandstone with fine gravel, moderately indurated, hard, moist.	
	@175'	60/60	100	46/60	76		
	@180'						
185						Total Depth - 180'	
190							
195							
200							
205							

ADDITIONAL COMMENTS:

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1964'±	DATE: 7/19/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Saugus Formation: Yellowish brown coarse grained gravel to cobble CONGLOMERATE with clayey silty fine to coarse sandstone matrix, well graded, dense, moist, rootlets, clasts consist of subangular to subrounded schist, granodiorite and quartzite.	
						@2.5' - Pale brown subrounded fine to coarse grained gravel CONGLOMERATE with weakly cemented fine to coarse sand matrix, well graded, hard, moist, rootlets.	
5						@6' - Highly scoured contact with dark yellowish brown silty fine grained SANDSTONE, poorly graded, hard, moist, weakly indurated, material blocky and fractured in sets every few inches, grades downward to fine grained SANDSTONE with gravel.	@6' B N68W/15SW @6-7.5' fracture set N82E/40SE
10	5	C		11.2	109.4		
						@10' - Grades to pale brown fine grained SANDSTONE with fine gravel, silt, and clay, well graded, dense, moist, slightly friable, pervasive subvertical dry white carbonate veins, grading to fine to medium grained sandy clayey SILTSTONE, dark yellowish brown, weakly indurated.	@14'8" Approx. BN24W/18SW
15						@15'5" - Contact to pale brown fine to medium grained SANDSTONE, graded, hard, moist.	@15'5" Fault N76E/70SE
						@16' - Discontinuous one foot thick zone on SW wall, pervasive subvertical carbonate fractures.	
						@19' - Grades to yellowish brown fine grained gravel to cobble	@19' Approx.
20	7	C		10.7	116.3	CONGLOMERATE with slightly friable fine to coarse sandstone matrix, well graded, hard, moist.	BN4W/11SW
						@21' - Channeled.	
						@22'5" - Fine grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist.	
25						@24' - Pocket of fine grained sandy clayey SILTSTONE in south wall.	
						@24'8" - Reddish brown fine to medium grained sandy clayey SILTSTONE with occasional fine gravel, poorly graded, hard, moist, weakly indurated, confined to NNE portion of boring with steep, sharp contact with sandstone from 22'5".	@28' Fault N75E/80NW
30	12	C		7.1	125.4	@30' - Grades to yellowish brown fine grained gravel to cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist, subangular to subrounded.	
						@33'8" - Reddish brown clayey SILTSTONE exits boring.	@33'8" C N84W/65NW
35			X				@33'9" Approx. BN57W/14SW
40	20-10"	C		8.9	121.4	@40' - Three 1/4" thick bedding parallel orange weathering surfaces.	@40' B N30W/7SW
						@43' - Yellowish brown clayey silty fine grained gravelly SANDSTONE, graded, hard, moist.	
45							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler

Kelly Bar Weights:
0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.
121 - 140', 1620 lbs.
161 - 160', 2020 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1964'±	DATE: 7/19/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@44'7" - Grades to coarse grained gravel to cobble CONGLOMERATE with fine to coarse sand matrix.	@44' Approx. BN55W/17SW
45			X			@46'3" - Slightly irregular and scoured contact to dark yellowish brown clayey SILTSTONE with fine to medium sand, poorly graded, hard, moist, weakly indurated.	@46'3" C N65W/10SW
						@46'10" - Grades to fine to medium grained SANDSTONE.	@48' B N43W/11SW
50	24	C		7.6	121.8	@47'8" - Grades to fine to coarse grained gravel CONGLOMERATE.	
						@48.5' - Contact with dark yellow brown clayey SILTSTONE.	
						@49.5' - Grades to yellowish brown fine grained gravel CONGLOMERATE with silty fine to coarse sand matrix, well graded, hard, moist, subangular, slightly friable.	@53' C N60E/10SE
55						@53' - Slightly irregular, scoured contact to dark yellow brown clayey SILTSTONE, hard, moist.	
						@54' - Grades to fine to medium grained SANDSTONE.	@57' Approx. CN20W/8SW
						@55' - Grades to grayish brown clayey silty fine to coarse grained gravelly SANDSTONE, well graded, slightly friable, hard, moist, clasts are subrounded.	
60	21	C		6.3	122.3		
						@56' - Grades to fine to coarse grained gravel CONGLOMERATE.	
						@57' - Slightly irregular to scoured contact with dark yellow brown clayey SILTSTONE.	
						@59' - Grades to grayish brown to dark yellowish brown subrounded fine grained gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, hard, moist.	@64' B N32W/16SW
65						@62' - 6" thick fine grained SANDSTONE bed, discontinuous.	@66.5' B N47W/15SW
						@67' - 6" thick dark yellow brown SILTSTONE.	@67' C N47W/15SW
						@69'5" - Grades to dark yellowish brown subangular to subrounded fine to coarse grained gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, hard, moist, occasional cobbles.	@69.5' B N42W/16SW
70	24	C		4.5	126.9		
						@74' - Discontinuous 3" thick clayey SANDSTONE, matrix grades to weakly cemented.	
75							
						@77' - Matrix grades to brown clayey fine to coarse grained SANDSTONE; channel deposit.	@77' Approx. Channel N30E/25SE
80	25	C		12.9	120.6		@80' B N40W/16SW
						@81.5' - Discontinuous claystone, 8" diameter pocket on west side of boring, within dark yellow brown fine to coarse grained gravel CONGLOMERATE, slightly friable fine to coarse sand matrix, well graded, hard, moist.	
85							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler

Kelly Bar Weights:
0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.
121 - 140', 1620 lbs.
161 - 160', 2020 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1964'±	DATE: 7/19/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
80							
85						@86' - Dark yellow brown clayey fine to medium grained sandy SILTSTONE, discontinuous, poorly graded, hard, moist, weakly indurated.	@87' B N56W/17SW
						@88.5' - Sharp, slightly scoured contact with medium grained SANDSTONE.	
90	30-7"	C		13.1	110.5	@90.5' - Grades to dark yellowish brown angular to subrounded coarse grained gravel to cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist.	@92.5' C N85E/14SE
						@92.5' - Slightly scoured contact with 1' thick SILTSTONE.	
95						@93.5' - Grades to dark yellowish brown subangular to subrounded gravel to cobble CONGLOMERATE with weakly cemented fine to coarse sand matrix, well graded, hard, moist.	@96' B N80W/18SW
						@95' - Color change to yellowish brown.	
						@96' - Bedding becoming slightly crude.	
100	30-10"	C		6.8	114.5		
							@101' B N65E/14SE
						@103' - Color change to dark yellowish brown and clayey matrix.	
105							
						@107' - 2" thick bed of dark yellow brown clayey SILTSTONE with fine to medium sand, hard, moist.	@106' Approx. BN50E/10SE @108' C N73W/16SW
110	30-10"	C		5.3	112.0	@110' - Grades to dark yellowish brown subangular to subrounded fine grained gravel to cobble CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, hard, moist.	@111' Approx. BN79E/9SE
115						@114'7" - Dark yellowish brown fine to coarse grained SANDSTONE, graded, hard, moist, slightly friable, thinly bedded.	@114'7" B N48W/6SW
						@115' - Grades to fine grained gravel to cobble CONGLOMERATE with fine to coarse sand matrix, subangular to subrounded clasts.	
						@118' - Moisture change to wet.	
120						@119'4" - Minor seep along contact with dark yellowish brown fine grained sandy SILTSTONE, poorly graded, hard, moderately indurated, moist.	@119'4" C N22W/10SW
						@121' - 12" thick clayey SILTSTONE.	
			X				
			X			@124.5' - 1/2" thick dark yellowish brown CLAYSTONE, poorly graded, very stiff, moist, highly plastic, corn flaky texture.	@124.5' S N35W/12SW
125							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler

Kelly Bar Weights:
0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.
121 - 140', 1620 lbs.
161 - 160', 2020 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1964'±	DATE: 7/19/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
120							
						@125.5' - Grades to dark yellowish brown silty fine to coarse grained SANDSTONE with subangular to subrounded fine to coarse gravel, graded, hard, moist.	
125						@127' - 4" thick fine to coarse grained gravel bed.	@127' Approx. BN74W/8SW
						@128' - Sharp, slightly irregular, scoured contact with dark yellowish brown fine to medium grained sandy clayey SILTSTONE, weakly indurated, sheared.	@128' SN70W/78NE Slicks Plunge 11°, S82E
130						@128.5' - Grades to fine to medium sandy SILTSTONE, not sheared.	
						@129' - Dark yellowish brown silty fine grained SANDSTONE to fine grained sandy SILTSTONE with occasional subangular fine gravel, poorly graded, hard, moist.	
135						@131' - Grades to dark yellowish brown fine grained gravelly silty fine to medium grained SANDSTONE, graded, hard, moist, subangular clasts.	
						@132' - Yellowish brown silty fine to medium grained SANDSTONE to fine to medium grained sandy SILTSTONE.	
	22	C		11.0	122.8	@133.5' - 6" thick clayey SANDSTONE.	
140						@135.5' - 12" thick dark yellowish brown fine grained gravelly clayey fine to coarse grained SANDSTONE, graded, hard, very moist, slightly to medium plastic, subangular clasts.	
						@138' - Dark yellowish brown fine grained gravelly silty fine to coarse grained SANDSTONE, well graded, hard, moist, 1/2mm thick discontinuous clay bed.	@141.5' S N20W/16SW
145						@141.5' - Shear zone, dark yellowish brown CLAYSTONE, highly plastic where sheared, very stiff, poorly graded, moist. Shear at 141.5' truncates others and is dominant.	@142.5' S N82E/27SE @143.5' B N49W/22SW
						@142.5' - Dark yellowish brown to yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, hard, moist, occasional rounded cobbles.	@146' C N56W/16SW
150						@143' - Color change to yellowish brown.	@148' S N78E/14SE
						@144' - Dark yellowish brown fine gravel CONGLOMERATE, weakly cemented.	@151' S N81W/56SW
						@145' - Matrix becomes clayey for 3".	
	24	C		12.6	117.0	@146' - Dark yellowish brown clayey SILTSTONE to silty CLAYSTONE, poorly graded, stiff, moist.	
155						@147.5' - Clayey SILTSTONE, pervasively sheared, shear at 148' is dominant.	
						@148.5' - Grades to clayey silty fine to coarse grained SANDSTONE with slightly friable channel deposit in E wall of fine grained gravel to cobble CONGLOMERATE, fine to coarse sand matrix.	
160						@150' - Dark yellowish brown fine grained sandy clayey SILTSTONE, poorly graded to graded, hard, moist.	
						@151' - Shear, truncated above by shear at 148'.	
						@154' - Dark yellowish brown silty fine to coarse grained SANDSTONE, graded, hard, moist.	
165							

ADDITIONAL COMMENTS:

Blows per 12"
C = Modified California Sampler

Kelly Bar Weights:
0 - 30', 5619 lbs.
31 - 60', 3745 lbs.
61 - 90', 2280 lbs.
91 - 120', 1223 lbs.
121 - 140', 1620 lbs.
161 - 160', 2020 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2325'	DATE: 8/28/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Mint Canyon Formation: Brown to dark grayish brown cobble CONGLOMERATE with slightly friable silty fine to medium sand matrix, well graded, hard, moist, clasts are subangular to subrounded.	
5						@6.5' - 5%-10% boulders.	@5' Approx. BN45E/9SE
						@7.5' - Discontinuous pale brown fine to coarse grained SANDSTONE with subangular fine gravel, moderately graded, hard, moist, cross bedded, slightly friable.	
10						@10' - End roots.	
						@12' - Light yellowish brown subangular to subrounded cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist, 20% boulders, increasing with depth, occasional subangular to subrounded gravel CONGLOMERATE interbeds.	@12' Approx. BN5W/20SW
15							
						@17' - Sharp scoured contact to discontinuous pale brown to light gray silty fine to medium grained SANDSTONE, poorly graded, hard, moist, weakly indurated.	@17' C N25W/23SW
20						@19' - Abruptly grades to pale brown to light gray subangular to subrounded cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist.	@19' B N75W/15SW
						@20' - Sharp scoured contact to discontinuous pale brown to light gray silty fine to medium grained SANDSTONE, poorly graded, hard, moist, weakly indurated.	@20' C N12W/22SW
25						@23' - Abruptly grades to pale brown to light gray subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist.	@24' B N25W/19SW
30						@24' - Grades to pale brown to light gray subangular to subrounded cobble CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, hard, moist.	
						@26.5' - Light gray to pale brown scoured-out discontinuous pocket of fine to coarse grained SANDSTONE with subangular fine gravel, poorly graded, very dense, moist, slightly friable to weakly cemented.	@31' B N42W/16SW @32.5' B N41W/19SW
35						@27' - Olive brown subangular to subrounded fine cobble CONGLOMERATE with slightly friable clayey fine to medium sand matrix, well graded, hard, moist, with occasional fine gravel CONGLOMERATE interbeds.	
						@28' - Occasional boulders (10%) to 30' depth.	@38' Approx. BN43W/20SW
40						@32.5' - 3" thick discontinuous light gray silty fine to medium grained SANDSTONE.	
						@36' - Olive brown to light gray subangular to subrounded cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix with lean clay, well graded, hard, moist, with occasional fine gravel CONGLOMERATE interbeds.	
45						@38' - Matrix grades to slightly plastic and clayey.	

ADDITIONAL COMMENTS:

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2325'	DATE: 8/28/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40						@41' - Occasional boulders (10%) in olive brown to light gray subangular to subrounded cobble CONGLOMERATE with slightly friable, slightly plastic silty fine to coarse sand matrix with CLAY, well graded, hard, moist.	
45							@45' B N40W/12SW
						@49' - Lean clay in matrix, non-plastic.	
50							
						@52' - End boulders to light gray subangular to subrounded cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist, with occasional poorly graded conglomerate.	
55							@55.5' Appox. BN28W/20SW @57.5' B N38W/19SW
60							
						@62.5' - Light gray cobble boulder CONGLOMERATE,.	
65						@66' - Refusal on boulder.	
70						Total Depth - 66' No groundwater No caving Backfilled	
75							
80							
85							

ADDITIONAL COMMENTS:

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2014'	DATE: 9/1/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Saugus Formation: Dark brown to grayish brown silty fine to medium grained SANDSTONE with trace angular to subangular fine gravel, poorly graded, dense, dry, rootlets.	
						@2' - Pale brown silty fine to medium grained SANDSTONE with subangular to subrounded fine gravel, poorly graded, dense, dry, subhorizontal calcium carbonate veins spaced 3-4" apart.	
2.5							
						@4' - Moist.	
5							
						@6' - Yellowish brown silty fine to medium grained SANDSTONE, poorly graded, dense, moist.	
			X			@7' - Grades to yellowish brown clayey SILTSTONE, poorly graded, dense, moist, slightly friable, subhorizontal calcium carbonate veins.	
7.5						@8' - Grades to silty fine grained SANDSTONE to fine grained sandy SILTSTONE.	
10							@10.5' carbonate vein N35E/21NW
						@11' - 2' thick discontinuous channel deposit in S quadrant, fine to coarse gravel CONGLOMERATE with slightly friable clayey fine to coarse sand matrix, well graded, dense, moist.	
12.5						@11.5' - Silty fine grained SANDSTONE to fine grained sandy SILTSTONE, coarsens to yellowish brown subangular fine gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, hard, moist.	@12' Approx. contact N86W/18SW
						@12' - Sharp, slightly scoured contact with discontinuous silty fine grained SANDSTONE to fine grained sandy SILTSTONE, poorly graded, hard, moist, slightly	
15	4/10-5"	C		8.9	122.0	friable, scoured out by gravels from 11'.	
			X			@13' - Slightly irregular contact to yellowish brown clayey SILTSTONE, poorly graded, hard, moist, slightly friable with mottled 1/2" claystone veins.	
						@14' - Reddish brown clayey SILTSTONE with olive green streaks, poorly graded, dense, moist.	@17' Approx. contact horizontal
17.5			X			@15' - Grades to dark yellowish brown subangular fine gravel CONGLOMERATE with fine to medium sandy silty clay matrix, well graded, very dense, moist, slightly friable, matrix is slightly plastic.	
						@15.5' - Grades to silty clayey SANDSTONE to clayey SILTSTONE with coarse sand and fine gravel, poorly graded, dense, moist, slightly friable, wavy.	
20						@17' - Grades to yellowish brown gravel to cobble CONGLOMERATE with friable to slightly friable fine to coarse sand matrix with trace silt, well graded, hard, moist.	
						@18' - Matrix changes to reddish brown, clayey silty fine to coarse sand.	
						@20' - Trace clay in matrix, coarse gravel CONGLOMERATE.	
						@22' - Boulders.	
22.5							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 24', 2854 lbs.
25 - 47', 1802 lbs.
48 - 70', 1091 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2014'	DATE: 9/1/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
20							
22.5						@23' - Matrix changes to yellowish brown fine to coarse sand.	
						@24' - Boulder.	
25						@25' - Dark grayish brown subangular to subrounded coarse gravel CONGLOMERATE with very clayey fine to coarse sand matrix, well graded, hard, moist.	
			X			@26' - Yellowish brown trace silty fine to coarse sand matrix.	
27.5			X			@26.5' - Yellowish brown interbedded clayey silty fine grained SANDSTONE to fine grained sandy clayey SILTSTONE, poorly graded, hard, moist, slightly friable.	
30	5/10-5"	C		14.5	109.3	@30' - Grades to light yellowish brown clayey silty fine to coarse grained SANDSTONE with trace subangular to subrounded fine to coarse gravel and trace fine gravel sized pockets of dark yellowish brown clayey SILT to silty CLAY, moderately graded, hard, moist, slightly friable.	@30' Approx. contact @30.5' Approx. BE-W/14S
32.5						@31' - Grades to subangular to subrounded gravel CONGLOMERATE with slightly friable clyey silty fine to coarse sand matrix, well graded, hard, moist.	
						@33.5' - Grades to grayish brown subangular to subrounded gravel to cobble CONGLOMERATE with fine to coarse sand matrix with trace silt, moderately graded, hard, moist.	
35						@35' - Boulder.	
						@36' - 1.5' diameter boulder.	
37.5							
							@39' B N42E/7SE
40						@40' - Yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with trace silty fine to coarse sand matrix, moderately graded, hard, moist.	
42.5							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 24', 2854 lbs.
25 - 47', 1802 lbs.
48 - 70', 1091 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2014'	DATE: 9/1/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@41' - Yellowish brown fine to coarse grained SANDSTONE, poorly graded, hard, moist.	
42.5							
						@44' - Yellowish brown clayey fine to coarse grained SANDSTONE with subrounded fine gravel, moderately graded, hard, moist.	
45	12-6"	C		10.9	98.6	@45' - Grades to yellowish brown subangular to subrounded fine to coarse grained gravel CONGLOMERATE with trace clayey fine to coarse sand matrix, well graded, hard, moist.	
47.5						Total Depth - 45' No groundwater No caving Backfilled	
50							
52.5							
55							
57.5							
60							
62.5							

ADDITIONAL COMMENTS: Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 24', 2854 lbs.
25 - 47', 1802 lbs.
48 - 70', 1091 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2080'	DATE: 9/5/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Landslide Debris?: Yellowish brown gravel to cobble CONGLOMERATE with silty fine to medium sand matrix, well graded, medium dense, dry, rootlets, blocky and fractured in upper 8", slightly friable.	
						@2' - Moist.	@2' B N78E/24NW
2.5						@3' - Sharp, scoured contact with dark yellowish brown CLAYSTONE, stiff, moist, massive.	@3' C N86E/19NW
			X				
5							
						@6' - End roots.	
7.5						@7.5' - 3" of medium plasticity within claystone.	
			X				
						@9' - Grades to dark yellowish brown fine to coarse grained sandy clayey SILTSTONE with trace subangular fine gravel, poorly graded, stiff, moist.	
10							
						@11' - Grades to dark yellowish brown clayey silty fine to medium grained SANDSTONE with 15% subangular fine gravel, moderately graded, medium dense, moist, slightly friable.	
12.5						@12.5' - Slightly scoured contact to dark yellowish brown clayey fine grained sandy SILTSTONE, poorly graded, stiff, moist, slightly plastic, slightly friable.	@12.5' C N24E/16NW
			X			@13.5' - 1-3" thick CLAYSTONE, stiff, moist, highly plastic, corn flaky texture, internally sheared, bounded below by clayey silty fine grained SANDSTONE, poorly graded, medium dense, moist, slightly plastic.	@13.5' S N8E/19NW
15	2/2	C		15.5	---	@15' - Dark yellowish brown silty fine to coarse grained sandy CLAYSTONE, stiff, moist, medium plastic.	
						@15.5' - Scoured contact to fine grained sandy SILTSTONE, poorly graded, stiff, moist, slightly plastic, slightly friable.	@15.5' Approx. CN72W/4NE
						@16' - Discontinuous 1" thick CLAYSTONE, sheared, highly plastic.	
17.5							
						@18' - Grades to fine gravel fine to coarse grained sandy SILTSTONE.	
						@19.5' - Grades to yellowish brown subangular fine grained gravel CONGLOMERATE, well graded, medium dense, moist, slightly friable.	
20							
			X			@20' - Grades to dark yellowish brown clayey silty fine to coarse grained SANDSTONE with subangular fine gravel, poorly graded, medium dense, moist.	
						@21' - Sharp contact to 2" thick dark yellowish brown silty CLAYSTONE, poorly graded, stiff, moist, internally sheared, shear cuts bedding in sands above.	@21' Approx. BN19W/10NE
22.5							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 24', 2854 lbs.
25 - 47', 1802 lbs.
48 - 70', 1091 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2080'	DATE: 9/5/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
20							
							@21'1" S
						@21.5' - Grades to clayey fine grained sandy SILTSTONE with trace subangular fine gravel, poorly graded, stiff, moist, slightly friable.	N60E/45SE
22.5							
						@24' - Increase in clay, material becomes slightly plastic.	
25							
						@26.5' - Abruptly grades to yellowish brown subangular to subrounded fine grained	
			C			gravel CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix,	@27' Approx.
27.5						moderately graded, medium dense, moist, 3-12" thick.	CN6W/27NE
						@27' - Sharp, irregular contact to 3" thick dark yellowish brown CLAYSTONE, stiff, moist, highly plastic, grades to clayey fine grained sandy SILTSTONE, poorly graded, stiff, moist, slightly friable.	
						@29' - Grades to yellowish brown silty fine grained SANDSTONE, poorly graded,	
30	2/4	C	X	20.2	105.2	medium dense, moist, slightly friable.	@30' S
						@29.5' - Sharp contact with discontinuous fine to coarse grianed SANDSTONE with fine gravel.	N63W/8SW
						@30' - Contact with 1-10" thick dark yellowish brown silty CLAYSTONE, poorly graded, stiff, moist, highly plastic, pervasively sheared, sheared lower contact.	
32.5						@31' - Saugus Formation: Dark yellowish brown SILTSTONE, weakly indurated, very stiff, moist.	
						@32.5' - Grades to dark yellowish brown silty fine to medium grained SANDSTONE with trace subangular to subrounded fine gravel, poorly graded, dense, moist, massive, slightly friable.	
35							
						@36.5' - 4" thick subangular fine grained gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, moderately graded, dense, moist.	@37' B
37.5						@37' - 3" thick subangular fine grained gravel CONGLOMERATE.	N35E/11SE
						@38' - Grades to yellowish brown fine to coarse grained SANDSTONE with trace subangular to subrounded fine gravel, poorly graded, dense, moist, slightly friable.	@38.5' C
						@38.5' - Sharp contact to dark yellowish brown clayey SILTSTONE, poorly graded, very stiff, moist, slightly friable.	N57E/8SE
40						@40' - Dark yellowish brown fine to medium grained sandy clayey SILTSTONE, poorly graded, very stiff, moist, slightly plastic, slightly friable.	
42.5							

ADDITIONAL COMMENTS: Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 24', 2854 lbs.
25 - 47', 1802 lbs.
48 - 70', 1091 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2080'	DATE: 9/5/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@42' - Grades to fine grained sandy clayey SILTSTONE, medium plastic.	
42.5						@43' - Grades to dark yellowish brown clayey silty fine to medium grained SANDSTONE, poorly graded, dense, moist, slightly plastic, slightly friable.	
45	3/7	C		19.9	107.7	@45' - Dark yellowish brown fine to medium grained sandy clayey SILTSTONE, poorly graded, very stiff, moist, medium plastic, slightly friable.	
47.5							
						@49' - Grades to dark yellowish brown very clayey silty fine grained SANDSTONE, poorly graded, dense, moist, slightly plastic, slightly friable.	
50							
52.5							
55						@55.5' - 5" thick dark yellowish brown fine grained gravel CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, dense, very moist. @56' - Dark yellowish brown clayey silty fine to coarse grained SANDSTONE, poorly graded, dense, moist, slightly friable.	@55.5' B N74E/9SE
57.5							
60	15-8"	C		13.3	---	@60' - Yellowish brown silty fine grained SANDSTONE with mottled iron staining and olive green veins, poorly graded, dense, moist, slightly plastic, slightly friable.	
62.5							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 24', 2854 lbs.
25 - 47', 1802 lbs.
48 - 70', 1091 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 2080'	DATE: 9/5/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
60							
62.5							
						@64' - Yellowish brown clayey fine grained sandy SILTSTONE to clayey silty fine grained SANDSTONE, poorly graded, dense, moist, slightly friable.	
65							
						@67' - Grades to yellowish brown clayey silty fine grained SANDSTONE, poorly graded, dense, moist, slightly plastic, slightly friable.	
67.5						@68' - Abruptly grades to yellowish brown gravel to cobble CONGLOMERATE with slightly friable clayey silty fine to medium sand matrix, well graded, dense, moist.	
70						Total Depth - 70' No groundwater No caving Backfilled	
72.5							
75							
77.5							
80							
82.5							

ADDITIONAL COMMENTS: Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 24', 2854 lbs.
25 - 47', 1802 lbs.
48 - 70', 1091 lbs.

SUBSURFACE DATA

LOG OF BORING B70

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1966'	DATE: 9/7/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Saugus Formation: Yellowish brown silty fine grained SANDSTONE with subangular to subrounded fine to coarse gravel, poorly graded, medium dense, moist, blocky and fractured in upper 6", rootlets to 3'.	
2.5						@2.5' - Dark yellowish brown clayey fine to medium grained sandy SILTSTONE with trace subangular fine gravel, poorly graded, stiff, moist, slightly friable.	
						@3.5' - Grades to yellowish brown silty fine to medium grained SANDSTONE, poorly graded, medium dense, moist, slightly friable.	
			X			@4.5' - Grades to yellowish brown subangular fine grained gravel CONGLOMERATE	
5			X			with slightly friable fine to medium sand matrix, moderately graded, medium dense, moist.	@5' C N29W/12SW
						@5' - Sharp contact with yellowish brown clayey fine to medium grained sandy SILTSTONE, poorly graded, stiff, moist, slightly friable.	@6.5' B N29W/16SW
						@5.5' - Grades to yellowish brown subangular fine grained gravel CONGLOMERATE	
7.5						with slightly friable fine to medium sand matrix, moderately graded, medium dense, moist.	@8' C N56W/22SW
						@5'9" - Sharp contact with yellowish brown clayey fine to medium grained sandy SILTSTONE, poorly graded, stiff, moist, slightly friable.	
						@6.2' - Grades to yellowish brown subangular fine grained gravel CONGLOMERATE	
10						with slighlty friable fine to medium sand matrix, moderately graded, medium dense, moist.	
						@8' - Slightly scoured contact with dark yellowish brown clayey very silty fine to medium grained SANDSTONE with trace subangular fine gravel, poorly graded, medium dense, moist, slightly plastic, massive.	
12.5							
15	2/4	C		5.4	119.5	@14.5' - Grades to clayey silty fine to medium grained SANDSTONE with 15% subangular to subrounded fine gravel, moderately graded, medium dense, moist, slightly friable.	
						@15' - Grades to yellowish brown subangular to subrounded gravel CONGLOMERAT with slightly friable fine to coarse sand (trace silt) matrix, well graded, medium dense, moist.	@16' B N6W/16SW
17.5							
						@18.5' - Sharp highly scoured (2.5' in SE quadrant) contact with dark yellowish brown fine to medium grained sandy very clayey SILTSTONE, poorly graded, stiff, moist, waxy, corn flaky texture, medium plastic.	@18.5' Approx. CN47E/47SE
20							@19.5' Approx. BN65E/10SE
22.5							

ADDITIONAL COMMENTS: Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 24', 2854 lbs.
25 - 47', 1802 lbs.
48 - 70', 1091 lbs.

SUBSURFACE DATA

LOG OF BORING B70

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1966'	DATE: 9/7/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
20							
22.5						@23' - Grades to dark yellowish brown very clayey fine to medium grained sandy SILTSTONE, poorly graded, stiff, moist, slightly plastic.	
25							
27.5						@27' - Grades to dark yellowish brown very fine grained very silty SANDSTONE, poorly graded, stiff, moist, slightly plastic.	
30	3/8	C		10.3	123.9	@30' - Grades to dark yellowish brown silty fine grained SANDSTONE with trace subrounded fine gravel, poorly graded, dense, moist.	
						@30.5' - Contact with dark yellowish brown 1" thick CLAYSTONE, stiff, moist, highly plastic, internal discontinous shear, truncated by sandstone above.	@30.5' Approx. SN84W/13SW
						@32' - 2-8" thick subangular fine grained gravel CONGLOMERATE, slightly friable.	@32' Approx. BN2W/12SW
32.5						@32.5' - Dark yellowish brown silty fine grained SANDSTONE, poorly graded, dense, moist, slightly friable.	
			X			@34' - 6" dark yellowish brown CLAYSTONE, highly plastic, stiff, moist, internally sheared, waxy, corn flaky, slightly friable.	@34.5' S N10W/9SW
35						@35' - Grades to brown silty fine to coarse grained SANDSTONE with subangular fine gravel, moderately graded, dense, moist.	
						@36.5' - Sheared contact to 3" thick dark yellowish brown CLAYSTONE, highly plastic.	@36.5' Sheared contact N39W/12SW
37.5						@36.8' - Grades to clayey silty fine grained SANDSTONE, poorly graded, dense, moist, slightly plastic, slightly friable.	
						@38' - Dark yellowish brown fine grained sandy silty CLAYSTONE with trace subangular fine gravel, poorly graded, very stiff, moist, medium plastic.	
40						@40' - Dark yellowish brown silty very clayey fine to coarse grained SANDSTONE with 10% subangular fine gravel, moderately graded, dense, moist, medium plastic.	
42.5							

ADDITIONAL COMMENTS: Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 24', 2854 lbs.
25 - 47', 1802 lbs.
48 - 70', 1091 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1966'	DATE: 9/7/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
42.5			X			@42' - 4" thick dark yellowish brown highly plastic CLAYSTONE, stiff, moist, sheared 1/4" below contact, parallel to contact, waxy, corn flaky texture. @42.3' - Dark yellowish brown clayey SILTSTONE, poorly graded, hard, moist, slightly plastic.	@42' Sheared contact N53W/12SW
45	4/10	C		12.9	123.5	@45' - Grades to dark yellowish brown clayey silty fine to medium grained SANDSTONE, poorly graded, very dense, moist.	
47.5						@47' - Dark yellowish brown silty fine to medium grained SANDSTONE with sparse coarse sand and subangular fine gravel, poorly graded, very dense, moist, discontinuous subangular fine gravel CONGLOMERATE with silty fine to coarse sand matrix.	@47' B N66W/24SW
50							
52.5						@51.5' - 4" thick dark yellowish brown CLAYSTONE, highly plastic, discontinuous shear.	@51.5' Approx. SN18E/8NW
						@53' - 1-2" thick dark yellowish brown CLAYSTONE, stiff, moist, waxy, corn flaky texture, highly plastic where sheared, medium plastic otherwise.	@53' Shear N30W/10SW
55							
						@55.5' - Discontinuous one foot thick fine gravel CONGLOMERATE.	@55.5' B N55W/16SW
57.5						@56.5' - Dark yellowish brown fine grained sandy SILTSTONE, poorly graded, hard, moist, slightly friable.	
						@58' - Grades to dark yellowish brown clayey silty fine to medium grained SANDSTONE, poorly graded, dense, moist, slightly friable.	
60	16-6"	C		10.4	108.3	@60' - Yellowish brown fine to medium grained sandy SILTSTONE, poorly graded, very stiff, moist, with dark yellowish brown trace fine to coarse grained sandy CLAYSTONE, highly plastic.	
62.5							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 24', 2854 lbs.
25 - 47', 1802 lbs.
48 - 70', 1091 lbs.

LOG OF BORING B70

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1966'	DATE: 9/7/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
60							
						@61.5' - Brown subangular cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, dense, moist, thickly bedded.	
62.5							
65						@65' - Brown subangular cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, dense, moist, thickly bedded.	@65' Approx. BN71W/18SW
67.5							
70						@70' - Brown subangular cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, dense, moist, thickly bedded.	
72.5							
						Total Depth - 74'	
						No groundwater	
75						No caving	
						Backfilled	
77.5							
80							
82.5							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 24', 2854 lbs.
25 - 47', 1802 lbs.
48 - 70', 1091 lbs.

SUBSURFACE DATA

LOG OF BORING B71

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1815'	DATE: 9/11/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Landslide Debris: Dark grayish brown to dark yellowish brown fine to coarse grained SAND with 10% subangular to subrounded fine to coarse gravel, graded, medium dense, dry.	
						@1' - Grades to dark yellowish brown fine to coarse grained SAND with 20% subangular to subrounded fine to coarse gravel, well graded, dense, moist.	@4' Approx.
5						@4' - Color change to yellowish brown and fine gravel to cobble sized clasts.	BN65E/16SE
			X			@6' - Absence of clasts, yellowish brown clayey fine to medium grained SAND, poorly graded, dense, moist, subvertical 1/4" thick carbonate stringers.	
						@8' - Dark yellowish brown fine to coarse grained SAND with 20% subangular to subrounded fine to coarse gravel, well graded, dense, moist.	
10							
						@12' - Clay lens.	@11' Approx. BE-W/17S
15	1/1	C		19.3	108.9	@15' - Yellowish brown fine to coarse grained SAND with angular to subangular fine gravel, moderately graded, dense, moist, contact with strong brown clayey fine grained SANDSTONE in tip, poorly graded, dense, moist, medium plastic.	
			X			@17' - Grades to yellowish brown fine to coarse grained SAND with angular to subangular fine gravel and clayey fine sand interbeds.	
20						@20' - Sharp contact with 6" thick strong brown clayey fine grained SAND, very moist to wet.	@20' Approx. CN55E/15SE
						@20.5' - Contact with yellowish brown 6" thick fine to coarse grained SAND with gravel.	@22.5' S
						@22.5' - 1/8" thick strong brown CLAY, exits boring, medium plastic, sheared.	N26E/17SE
						@23' - Less than 1/8" thick lower bound shear (continuous) within discontinuous 1-6" thick CLAY to clayey fine grained SAND, slickensides bear N71W.	@23' S N74E/4NW
25						Saugus Formation: Dark yellowish brown to olive brown fine to coarse grained SANDSTONE grading to boulder CONGLOMERATE with weakly cemented fine to coarse sand matrix, well graded, hard, moist.	@25' Approx. CN55E/17SE
			X			@25' - Mint Canyon Formation: Slightly irregular, undulatory, scoured contact with gray fine to coarse grained SANDSTONE, poorly graded, very dense, moist, weakly indurated.	
30						@26' - Grades to gray subangular to subrounded fine gravel to cobble CONGLOMERATE with moderately cemented fine to coarse sand matrix, well graded, hard, moist.	@31' B N18W/22SW @32' B N50W/16SW
35						@30' - Grades to coarse gravel CONGLOMERATE, poorly graded, hard, moist.	@33' C N55E/29NW
						@31' - Crude bedding.	
						@33' - Scoured contact to light gray fine to coarse grained SANDSTONE, weakly indurated.	@35' Approx. BN5E/18NW
						@35' - Thin coarse gravel to boulder CONGLOMERATE within sandstone.	
40						@36' - Grades to conglomeratic fine to coarse grained SANDSTONE with fine gravel clasts and occasional boulders, very dense, moist, weakly cemented.	
						@39' - Grades to boulder CONGLOMERATE.	
45							

ADDITIONAL COMMENTS:

Total Depth 42'
No groundwater, No caving, backfilled.
Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 25', 2854 lbs.
25 - 49', 1802 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1846'	DATE: 9/13/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Saugus Formation: Yellowish brown subangular fine grained gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, dry in upper 6", moist below, blocky and fractured in upper 8", roots to 3'.	@1' B N58W/17NE
						@2' - Discontinuous dark brown CLAY pocket in N wall.	
			X			@2'3" - Slightly scoured contact with silty fine grained SANDSTONE, poorly graded, hard, moist.	
5						@2.5' - Grades to dark brown very clayey fine to medium grained SANDSTONE with coarse sand sized dry white carbonate nodules, hard, moist.	
						@4.5' - Grades to yellowish brown subangular to subrounded fine gravel to cobble CONGLOMERATE with silty fine to medium sand matrix, well graded, hard, moist.	@8' Approx. BN30W/16SW
10						@9.5' - Absence of clasts in yellowish brown fine to coarse grained SANDSTONE.	
						@11' - Grades to subangular to subrounded fine grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist, slightly friable.	@11' B N52W/13SE
						@11.5' - Sharp scoured contact to strong brown very silty fine grained SANDSTONE.	@11.5' Approx. CN57E/11NW
15	2/4	C		14.4	120.6	@12' - 6" thick fine to coarse grained SANDSTONE with subangular to subrounded fine gravel.	@14.5' Approx. SN22W/1SW
						@14.5' - Undulatory sharp upper contact with strong brown CLAYSTONE, sheared, highly plastic, waxy, corn flaky texture, moist.	
						@15' - Brown clayey silty fine to coarse grained SANDSTONE with subangular fine gravel, poorly graded, hard, moist.	@19' B N50W/12SW
20						@19' - Abruptly grades to yellowish brown subangular to subrounded gravel CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist.	
						@19.5' - Slightly scoured contact to dark yellowish brown 4" thick very silty fine grained SANDSTONE, overlying strong brown clayey SILTSTONE.	
						@21.3' - Becomes waxy for 3".	
25						@23' - Grades to dark yellowish brown clayey silty fine grained SANDSTONE with sparse medium to coarse sand, poorly graded, hard, moist.	
						@27.5' - 3" thick section of subrounded fine gravel in silty fine to medium grained SANDSTONE.	
30	4/8	C		14.8	118.7	@30' - Brown to dark yellowish brown silty fine to medium grained SANDSTONE, poorly graded, hard, moist.	
						@33.5' - 1' thick section of subrounded fine gravel within silty fine to medium grained SANDSTONE.	
35						@35.5' - Abruptly grades to subangular to subrounded gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, hard, moist.	@36' B N46W/15SW
						@38' - Slightly scoured sharp contact to strong brown clayey fine grained sandy SILTSTONE, poorly graded, hard, moist.	@38' C N21W/22NE
40						@39.5' - Two 6" thick channel deposits, yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, very dense, moist, exits in N and W walls.	
45							

ADDITIONAL COMMENTS: Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 25', 2854 lbs.
25 - 48', 1802 lbs.
48 - 70', 1019 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1846'	DATE: 9/13/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@43' - Grades to dark yellowish brown silty fine grained SANDSTONE, poorly graded, hard, moist.	
45	5/12	C		12.4	121.8	@44' - 2" thick zone of fine gravel sized dry white carbonate nodules.	
						@45' - Yellowish brown silty fine grained SANDSTONE, poorly graded, hard, moist.	
						@47' - Grades to yellowish brown fine to coarse grained SANDSTONE which grades to 2" thick subangular to subrounded fine grained gravel CONGLOMERATE at base.	@47' B N26W/11SW
						@48' - Sharp, slightly scoured contact with dark yellowish brown silty fine grained SANDSTONE, poorly graded, hard, moist.	@48' C N31W/10SW
50						@50.5' - Grades to yellowish brown fine to coarse grained SANDSTONE, poorly graded, hard, moist, slightly friable.	@52.5' B N49E/10SE
						@51.5' - Grades to yellowish brown subangular to subrounded gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, hard, moist.	@54' B N22E/14NW
55						@52.5' - Crudely bedded.	@55' C N60W/17SW
						@55' - Sharp, scoured contact to yellowish brown silty fine grained SANDSTONE, poorly graded, hard, moist.	
60	7/16-2"	C		16.7	110.5	@60' - Brown to yellowish brown silty fine grained SANDSTONE with sparse medium sand and trace subrounded fine gravel, poorly graded, hard, moist.	
						@60.5' - 6" thick section of subangular to subrounded gravel clasts in clayey silty fine grained SANDSTONE.	
						@62' - Strong brown trace fine to medium grained sandy SILTSTONE, weakly indurated, poorly graded, hard.	
65						@63' - Grades to yellowish brown fine grained gravel CONGLOMERATE with clayey fine to coarse sand matrix and trace subrounded cobbles, well graded, hard, moist.	
						@68' - Yellowish brown silty fine to coarse grained SANDSTONE with subangular fine gravel, moderately graded, hard, moist.	
70							
75						Total Depth - 72' No groundwater No caving Backfilled	
80							
85							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 25', 2854 lbs.
25 - 48', 1802 lbs.
48 - 70', 1019 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1836'	DATE: 9/14/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Landslide Debris: Brown to dark brown fine grained sandy silty CLAY, poorly graded, hard, moist, slightly plastic, upper 1' is dry.	
						@3' - Yellowish brown subangular to subrounded coarse grained gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, dense, dry.	@3' Approx. BN54E/20SE
5			X				
						@7.5' - Sharp, irregular, scoured contact with yellowish brown silty fine grained SAND with angular to subangular fine gravel and sparse medium to coarse sand, poorly graded, very dense, moist, occasional dry white carbonate stringers, subvertical to subhorizontal.	@7.5' Approx. CN87W/12SW
10						@11' - 3" thick light yellowish brown silty fine to medium grained SAND layer.	
						@11.5' - Discontinuous 3" thick clayey SILT to silty CLAY, irregular upper and lower contacts, medium plastic.	@13.5' Approx. BN65E/17NW
15						@13.5' - Abruptly grades to cobble to boulder CONGLOMERATE with fine to coarse sand matrix, well graded, very dense, moist, predominantly massive.	
20							
			X			@22' - Sheared contact to 1/2" to 1" thick dark yellowish brown CLAY, highly plastic, waxy, corn flaky texture, grades to dark yellowish brown clayey SILT, poorly graded, hard, moist.	@22' Sheared contact N63W/11SW
			X				
	2/5	C		14.4	118.4		
25						@24' - Dark yellowish brown clayey SILT, poorly graded, hard, moist.	
						@27' - Grades to clayey silty fine to coarse grained SAND with subrounded fine gravel.	
						@28' - Irregular, slightly scoured contact to fine to coarse grianed sandy clayey SILT, poorly graded, hard, moist.	@28' C N52W/20SW
			X				
30	3/11	C		16.3	114.4	@29' - Sheared upper contact to strong brown 1/4" to 1" thick CLAYSTONE, highly plastic, waxy, corn flaky texture.	@29' S N39W/8SW
						@30' - Yellowish brown silty fine to medium grained SANDSTONE, poorly graded, very dense, moist.	
						@30.5' - Grades to clayey silty fine to medium grained SAND, poorly graded, very dense, moist, slightly plastic.	
35						@34' - Grades to yellowish brown subrounded fine grained gravel CONGLOMERATE with clayey silty fine to coarse sand matrix, well graded, very dense, moist to very moist, highly channelized.	@35.5' C N42W/13SW
						@35.5' - Sharp, irregular slightly scoured contact to dark yellowish brown clayey silty fine grained SAND, poorly graded, very dense, moist, slightly plastic.	@39.8' B N41W/13SW
40						@39.8' - 2-5" thick olive brown fine to coarse grained SAND with subrounded fine gravel in clayey silty fine grained SAND from 35.5'.	
45							

ADDITIONAL COMMENTS: Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 25', 2854 lbs.
25 - 48', 1802 lbs.
48 - 70', 1019 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1836'	DATE: 9/14/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
						@41.5' - Abruptly grades to olive brown subangular to subrounded gravel CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, very dense, moist.	@42' B N34W/15SW
			X			@43' - Slightly scoured, sharp contact to dark yellowish brown fine grained sandy	@43' C
45	12-6"	C	X	10.9	116.0	clayey SILT, poorly graded, hard, moist, slightly plastic.	N33W/12SW
						@44' - 1/4" thick strong brown CLAY, highly plastic, sheared on upper contact, waxy, corn flaky, bedding below this point is well defined.	@46' B N41W/15SW
						@44.5' - Saugus Formation: Olive brown silty fine grained SANDSTONE, poorly graded, very dense, moist, weakly cemented between many discontinuous lenses of this	@49.5' B
50						material and dark yellowish brown fine grained sandy clayey SILTSTONE.	N14W/8SW
						@45' - Olive brown clayey fine grained sandy SILTSTONE to silty fine grained SANDSTONE, poorly graded, very dense, moist, grades to subangular to subrounded gravel CONGLOMERATE with olive silty fine sand matrix.	@53' B
						@45.8' - Grades to olive brown gravel to cobble CONGLOMERATE with silty fine to	N55W/18SW
55						coarse sand matrix, well graded, hard.	
						@46.8' - Slightly scoured contact to olive fine to coarse grained SANDSTONE, hard, moist, slightly friable to friable.	
						@48.5' - Grades to olive fine to coarse grained SANDSTONE with 20% subrounded fine gravel.	
60						@53.5' - Grades to olive fine grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist.	
						@55' - Olive cobble CONGLOMERATE with fine to coarse sand matrix, well graded, hard, moist.	
						@56' - Olive brown gravel to cobble CONGLOMERATE with fine to coarse sand matrix,	
65						well graded, hard, moist.	
70						Total Depth - 60'	
						No groundwater	
						No caving	
						Backfilled	
75							
80							
85							

ADDITIONAL COMMENTS: Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 25', 2854 lbs.
25 - 48', 1802 lbs.
48 - 70', 1019 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1713'	DATE: 9/20/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Landslide Debris?: Soil formation, dark brown, blocky and fractured, dry, roots to 3'.	
						@1' - Olive green silty fine grained SAND with 2" thick gravel CONGLOMERATE layer at base, poorly graded, very dense, moist.	@1.5' B N31W/9SW
						@1.5' - Yellowish brown silty fine grained SAND with pervasive carbonate stringers, poorly graded, moist, pervasively fractured.	@3.5' B N40W/10SW
5						@3.5' - Yellowish brown silty fine grained SAND mottled with material from 1'.	
			X			@5' - Yellowish brown fine grained sandy SILT with sparse medium to coarse sand, poorly graded, very dense, moist, slightly friable, slightly plastic.	
10						@8' - Grades to olive yellow silty fine grained SAND, poorly graded, very dense, moist.	
						@9.5' - 10% subangular fine to coarse grained GRAVEL with trace subangular small cobbles.	@11' B N13W/12SW
						@11' - Grades to olive yellow gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, very dense, moist, slightly friable.	@13.5' B N70E/16NW
15	8-6"			5.0	115.8	@12' - Pale yellow silty fine to medium grained SAND, poorly graded, very dense, moist, slightly friable.	@16' B N22E/9NW
						@13' - Grades to fine to coarse grained SAND.	
						@14' - Grades to fine to coarse grained SAND with abundant fine to coarse gravel.	
20						@14.5' - 3-4" thick gravel CONGLOMERATE interbed.	
						@15' - Light yellowish brown fine to coarse grained SAND with 30% angular to subangular fine gravel and trace subagular cobbles,very dense, moist.	@22.5' B N36W/8SW
						@18.5' - Grades to yellowish brown subangular to subrounded gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, very dense, moist, slightly friable.	
25						@20-22' - Boulders.	
						Refusal on boulder.	
30						Total Depth - 27.5'	
						No groundwater	
						No caving	
						Backfilled	
35							
40							
45							

ADDITIONAL COMMENTS: Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 25', 2854 lbs.
25 - 48', 1802 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1752'	DATE: 9/19/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Landslide Debris?: Strong brown silty fine to medium grained SAND, poorly graded, loose, moist, dry in upper 6", roots to 4', slightly friable.	
						@2' - Grades to irregular contact with yellowish brown angular to subrounded fine gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, loose, moist, thickness irregular and bedding interrupted by jumbled pockets of silty sandy material from above and below.	@3' C N8W/26SW
5						@3' - Slightly scoured contact to strong brown silty fine to medium grained SAND, poorly graded, loose, moist, slightly friable.	@3.5' Approx. BN10W/25SW
						@3.5' - 3" thick dark brown silty CLAY, poorly graded, very stiff, moist, grades to strong brown silty fine to medium grained SAND with subangular fine gravel and sparse sand, poorly graded, dense, moist, slightly friable.	@7' B N2E/19SW @9' C N19W/12SW
10			X			@6.5' - Grades to strong brown subangular to subrounded gravel CONGLOMERATE with clayey sand matrix.	@10' S N32W/17SW
						@7' - Pale brown loose clay in matrix.	
						@9' - Slightly scoured contact with brown fine grained sandy clayey SILTSTONE, poorly graded, stiff, moist.	
15						@10' - Dark yellowish brown CLAY, poorly graded, very moist, highly plastic, upper inch is sheared, corn flaky texture, waxy, laminated.	@17' B
	2/7-5"	C		16.7	114.3	@10.5' - Grades to dark grayish brown fine to coarse grained sandy CLAY with trace subangular to subrounded fine gravel, poorly graded, stiff, moist.	N17W/6SW @17.5' C N35W/10SW
20						@12' - Yellowish brown very clayey fine to coarse grained SAND with 20% to 30% subangular gravel, moderately graded, medium dense to dense, moist.	@19' C N35W/12SW
						@14' - Gravel to cobble (angular to subangular) in clay, disturbed (mottled appearance).	
						@15' - Pale brown clayey silty fine to coarse grained SAND with angular to subangular fine gravel, moderately graded, moist, dense to very dense, slightly friable.	@21' C N44W/10SW
25						@16.5' - Olive green silty fine to medium grained SAND, poorly graded, very dense, moist, slightly friable.	@23' C/B N48W/9SW
						@17' - Grades to subrounded fine gravel CONGLOMERATE with fine to coarse sand matrix, well graded, very dense, moist, slightly friable.	@24' C N84W/8SW
						@17.5' - Slightly scoured contact with strong brown fine grained sandy clayey SILTSTONE, poorly graded, hard, moist, weakly indurated.	
30						@18.5' - Mottled strong brown and pale brown fine grained sandy SILTSTONE, poorly graded, moist, overlying olive green clayey silty fine to coarse grained SAND with channeled pockets of subangular to subrounded fine gravel CONGLOMERATE.	
						@21' - Strong brown clayey silty fine grained SAND, poorly graded, very dense, moist.	
35						@23' - Olive green clayey silty fine to coarse grained SAND.	
						@24' - Strong brown clayey silty fine grained SAND, poorly graded, very dense, moist.	
						@26' - Olive green very silty fine grained SAND, poorly graded, very dense, moist.	
						@27' - Grades to olive green silty fine to medium grained SAND with subangular fine gravel and sparse coarse sand;.	
40						@27.5' - Cobbles.	
						Total Depth - 28', refusal on boulder	
						No groundwater, No caving	
45						Backfilled	

ADDITIONAL COMMENTS: Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 25', 2854 lbs.
25 - 48', 1802 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1804'	DATE: 9/20/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
0						Saugus Formation: Dark brown soil formation, moist.	
						@1.5' - Yellowish brown subangular to subrounded cobble CONGLOMERATE with slightly friable silty fine sand matrix with sparse coarse sand, well graded, moist, medium dense, roots to 4'.	
5							
			X				@7' B N19E/7NW
10							
						@11' - Grayish brown subangular to subrounded cobble CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, very dense, moist.	
15	4/8	C		7.8	123.7	@15' - Yellowish brown subangular to subrounded gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist.	
							@17.5' Approx. BN75W/15SW
20						@20' - Yellowish brown subangular to subrounded gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist.	
25							
						@28' - Grayish brown subangular to subrounded cobble CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, hard, moist.	
30	4/18	C		6.7	117.2	@31' - Pale brown to yellowish brown subangular to subrounded cobble CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, hard, moist.	
35						@35' - Mint Canyon Formation: Sharp scoured contact with yellowish brown fine grained sandy SILTSTONE, poorly graded, hard, moist, weakly indurated, sheared upper contact and shear in upper inch making material soft and slightly friable.	@35' CN6E/17NW SN22E/32NW
40						@37' - Grades to olive brown subangular to subrounded cobble CONGLOMERATE, slightly friable clayey silty fine to coarse sand matrix, hard, moist, well graded.	@39' Approx. BN2W/11W
45							

ADDITIONAL COMMENTS:

Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 25', 2854 lbs.
25 - 48', 1802 lbs.
48 - 70', 1019 lbs.
70 - 95', 1491 lbs.

CLIENT: Pardee Homes	PROJECT: Skyline Ranch	W.O.: 8838.002
LOCATION: Santa Clarita	ELEVATION: 1804'	DATE: 9/20/06
RIG TYPE: 24" Bucket	HAMMER WEIGHTS: Kelly Bar Weights	DROP: 12"

	N	U	B	M	DD	DESCRIPTION	ATTITUDES
40							
45	5/15	C		7.3	119.9	@45' - Olive brown subangular to subrounded cobble CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, hard, moist, well graded, overlying light gray fine grained sandy SILTSTONE, poorly graded, weakly indurated, hard, moist.	
50						@50' - Sharp scoured contact with gray very silty fine grained SANDSTONE, poorly graded, very dense, moist, weakly indurated. @50.5' - Clay healed fracture, 1/2mm thick, highly plastic, moist. @52' - Grades to CONGLOMERATE. @54' - 8-10" thick interbed of silty fine to medium grained SANDSTONE, poorly graded, weakly indurated, cross-bedded, roughly horizontal, very dense, moist, to olive brown subangular to subrounded cobble CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, hard, moist.	@50' C N80W/15SW @50.5' FR N31E/14SE
55							
60							
65						@63' - Olive brown subangular to subrounded cobble CONGLOMERATE with slightly friable clayey silty fine to coarse sand matrix, well graded, hard, moist.	
70	15-6"	C		11.6	105.1	@70' - Brown clayey SILTSTONE, poorly graded, hard, moist, weakly indurated.	@68' B N10E/17NW @70.5' C N2E/12NW
75						@73' - Olive brown subangular to subrounded cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist. @77' - Matrix grades to clayey silty fine to medium sand with sparse coarse sand.	
80						Total Depth - 78' No groundwater Minor caving from 17-22' Backfilled	
85							

ADDITIONAL COMMENTS: Blows per 6"
C = Modified California Sampler
Kelly Bar Weights: 0 - 25', 2854 lbs.
25 - 48', 1802 lbs.
48 - 70', 1019 lbs.
70 - 95', 1491 lbs.

APPENDIX B

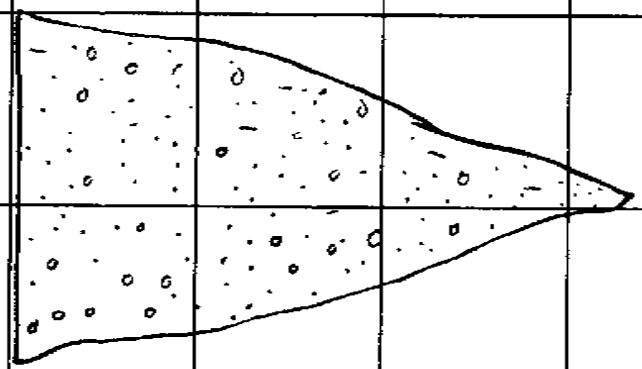
TEST PIT LOGS
TP24 THROUGH TP208

TTM 060922, SKYLINE RANCH
COUNTY OF LOS ANGELES, CALIFORNIA

LOG OF EXCAVATION Trench No. TP24	Logged By: AH	Date Excavated: 3/27/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Colluvium: Brown silty SAND with gravel and cobbles, abundant roots, loose, moist.	
2 - 7.5	Saugus Formation: Brown gravelly cobbly SANDSTONE, cobbles are rounded, gravels are subrounded, weakly cemented, moist, very dense, abundant rootlets, massive.	
	Total Depth - 7.5' No groundwater No caving Backfilled	

Graphic Log

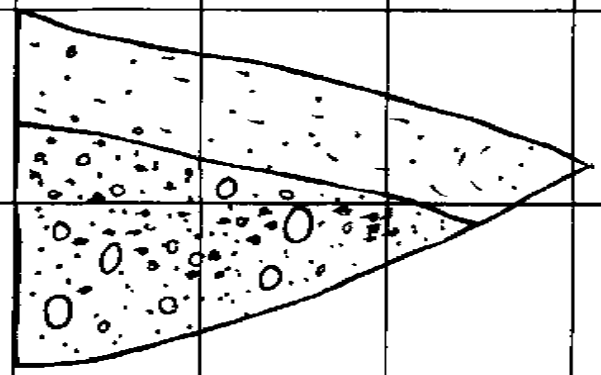


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP24

LOG OF EXCAVATION Trench No. TP25	Logged By: AH	Date Excavated: 3/27/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Colluvium: Brown silty SAND with gravel, roots, very moist.	
3 - 8.5	Saugus Formation: Orangish brown SANDSTONE with subrounded gravel and cobbles, moist, very dense, massive.	
	Total Depth - 8.5' No groundwater No caving Backfilled	

Graphic Log

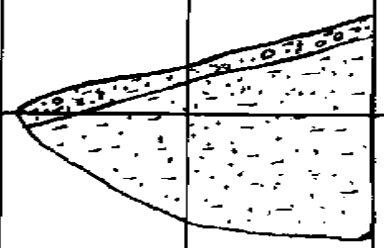


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP25

LOG OF EXCAVATION Trench No. TP26	Logged By: AH	Date Excavated: 3/27/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Colluvium: Dark brown silty SAND with gravel and organics, roots, very moist.	
1 - 8	Saugus Formation: Orangish brown silty fine to medium grained SANDSTONE, moist, very dense, massive.	
	Total Depth - 8' No groundwater No caving Backfilled	

Graphic Log

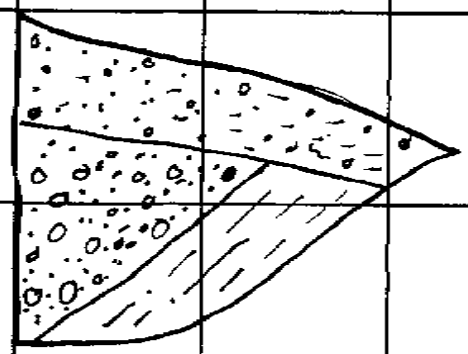


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP26

LOG OF EXCAVATION Trench No. TP27	Logged By: AH	Date Excavated: 3/27/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Alluvium: Brown silty SAND with gravel and cobbles, abundant roots and roothairs, loose.	
2 - 3	Cobbles, gravel and sand, wet, loose.	
3 - 8	Saugus Formation: Orange, white, and tan CONGLOMERATE with contact to brown clayey SILTSTONE, moist, very stiff, massive.	@5' Contact N88W/5SW
	Total Depth - 8' Wet from 2-3' No caving Backfilled	

Graphic Log

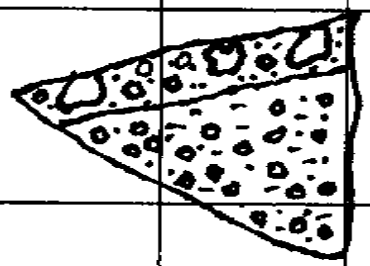


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP27

LOG OF EXCAVATION Trench No. TP28	Logged By: AH	Date Excavated: 3/27/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Alluvium: Brown clayey fine to coarse grained SAND with gravel and (5-10%) boulders, pockets of friable medium to coarse SAND with gravel and boulders, wet, medium dense, roots.	
2 - 6	Saugus Formation: Gravel CONGLOMERATE with orangish tan medium to coarse sand matrix, very moist, very dense, massive.	
	Total Depth - 6' Wet to 2' No caving Backfilled	

Graphic Log

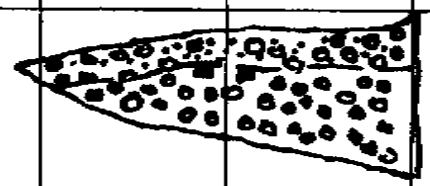


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP28

LOG OF EXCAVATION Trench No. TP29	Logged By: AH	Date Excavated: 3/27/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Alluvium: Brown silty SAND with gravel and cobbles, moist, loose, roots and roothairs.	
1 - 4.5	Saugus Formation: Orangish brown CONGLOMERATE, moist, dense, weathered, roothairs.	
	Total Depth - 4.5' No groundwater No caving Backfilled	

Graphic Log

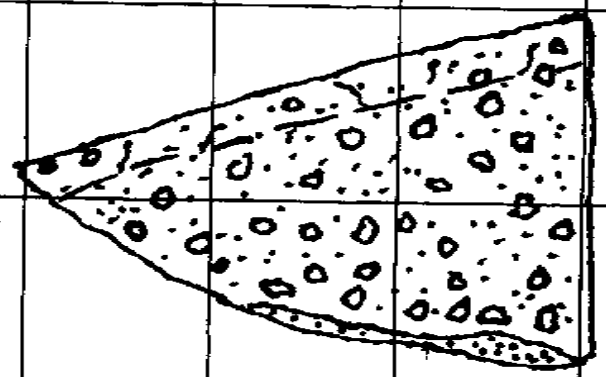


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP29

LOG OF EXCAVATION Trench No. TP30	Logged By: AH	Date Excavated: 3/27/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Colluvium: Brown silty SAND with gravel, roots, very moist.	
1 - 8.5	Saugus Formation: Orangish brown medium to coarse grained SANDSTONE with gravel and cobbles, friable, moist, dense, massive.	
	Total Depth - 8.5' No groundwater No caving Backfilled	

Graphic Log

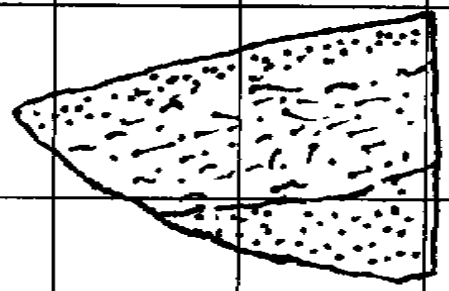


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP30

LOG OF EXCAVATION Trench No. TP31	Logged By: AH	Date Excavated: 3/27/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Colluvium: Dark brown silty SAND with gravel, moist, loose, roots.	
1 - 2	Light brown sandy SILT, wet, roots and roothairs.	
2 - 4	Saugus Formation: Light brown sandy SILTSTONE, hard, weathered, moist to very moist, very stiff, massive.	
4 - 6.5	Brown fine to coarse grained SANDSTONE with gravel and cobbles, moist, dense, friable, massive.	
	Total Depth - 6.5' Wet from 1-2' No caving Backfilled	

Graphic Log

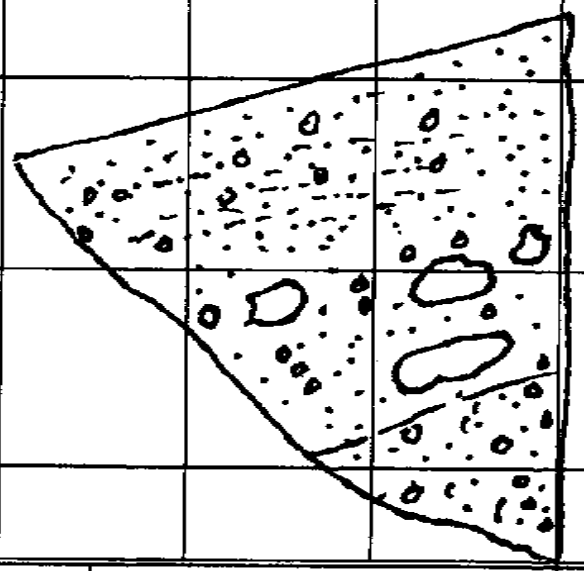


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP31

LOG OF EXCAVATION Trench No. TP32	Logged By: AH	Date Excavated: 3/27/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4	Colluvium: Brown silty SAND with gravel and cobbles, loose, very moist.	
4 - 8	Brown silty SAND with gravel, cobbles, and boulders, boulders (approximately 20% up to 3' diameter), very moist, loose.	
8 - 11	Mint Canyon Formation: Tan gravelly SANDSTONE with cobbles, massive, weathered, friable, moist, dense.	
11 - 13	Tan gravelly SANDSTONE with cobbles, massive, friable, moist, dense.	
	Total Depth - 13' No groundwater No caving Backfilled	

Graphic Log

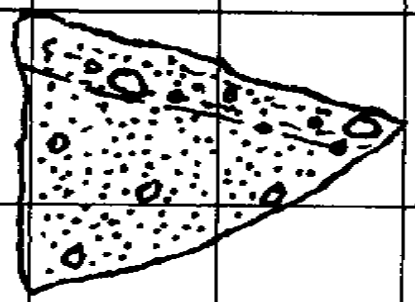


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP32

LOG OF EXCAVATION Trench No. TP33	Logged By: AH	Date Excavated: 3/27/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Colluvium: Brown sandy SILT with gravel and cobbles (less than 5% boulders), very moist, stiff.	
2 - 7	Mint Canyon Formation: Gray fine grained SANDSTONE, moist, very dense, weakly cemented, massive, occasional subrounded cobbles.	
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

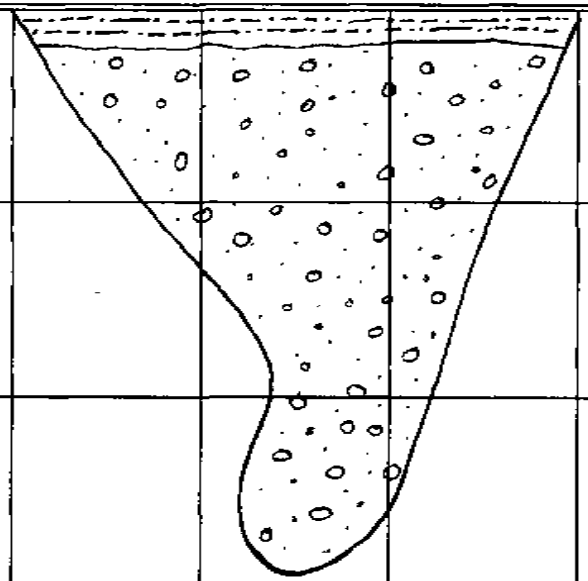


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP33

LOG OF EXCAVATION Trench No. TP34	Logged By: RMP	Date Excavated: 4/19/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Very dark brown fine to medium grained sandy clayey SILT, graded, soft, very moist, roots.	
1 - 14.5	Saugus Formation: Tan cobble CONGLOMERATE, rounded to subrounded clasts commonly granitoid, gneiss, and quartzite, well graded, massive, slightly friable, very dense, moist.	
	Total Depth - 14.5' No groundwater No caving Backfilled	

Graphic Log

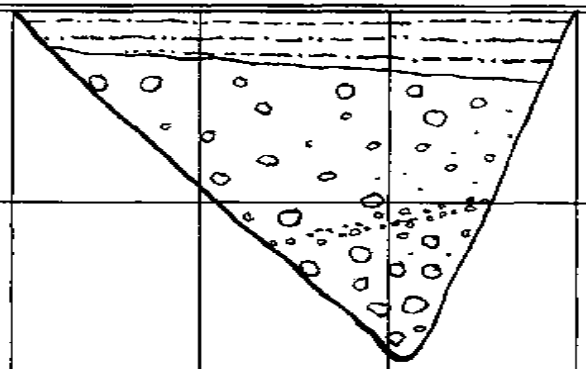


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP34

LOG OF EXCAVATION Trench No. TP35	Logged By: RMP	Date Excavated: 4/19/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Topsoil: Very dark brown fine to medium grained sandy clayey SILT, moderately graded, soft, very moist, roots.	
2 - 9	Saugus Formation: Tan cobble CONGLOMERATE, rounded to subrounded clasts commonly granitoid and quartzite, well graded, poorly bedded, slightly friable, dense, moist, roots to 6', gravel lens at 6', largest cobble is 10" in diameter.	@6' BN45E/19NW
	Total Depth - 9' No groundwater No caving Backfilled	

Graphic Log

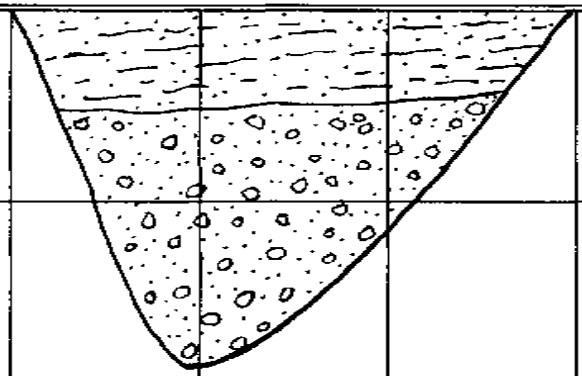


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP35

LOG OF EXCAVATION Trench No. TP36	Logged By: RMP	Date Excavated: 4/19/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Topsoil: Very dark brown sandy, silty CLAY, with subrounded fine to coarse grained gravel, well graded, soft, moist, roots.	
2.5 - 9	Terrace Deposit: Orange to tan cobble GRAVEL with sand, subrounded to rounded clasts commonly gneiss, volcanic and granitoid, well graded, massive, slightly friable, dense, dry to very moist (inconsistent moisture).	
	Total Depth - 9' No groundwater No caving Backfilled	

Graphic Log

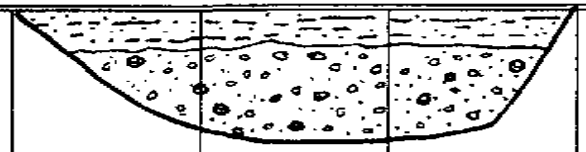


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP36

LOG OF EXCAVATION Trench No. TP37	Logged By: RMP	Date Excavated: 4/19/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Very dark brown fine to medium grained sandy clayey SILT, graded, soft, moist, roots.	
1 - 3	Saugus Formation: Orange to tan gravel CONGLOMERATE, subrounded clasts, well graded, massive, weakly cemented, very dense, moist, roots throughout.	
	Total Depth - 3' No groundwater No caving Refusal at 3' Backfilled	

Graphic Log

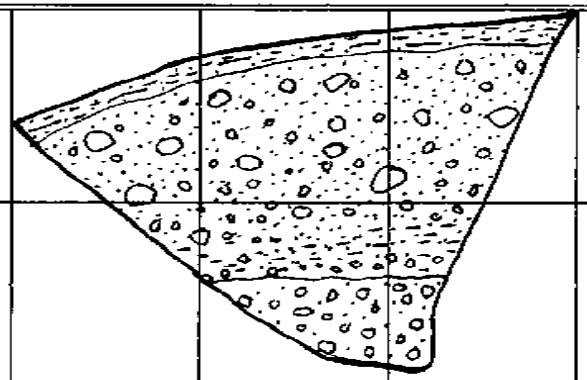


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP37

LOG OF EXCAVATION Trench No. TP38	Logged By: RMP	Date Excavated: 4/19/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Very dark brown to black fine to coarse grained sandy clayey SILT, graded, soft, moist, abundant roots.	
1 - 7	Saugus Formation: Orange to tan fine to coarse grained sandy cobble GRAVEL, subrounded clasts, well graded, massive, friable, highly weathered, very moist, disturbed by roots.	
7 - 7.5	Interbed of brown fine grained sandy SILTSTONE, moderately graded, stiff, moist, discontinuous.	
7.5 - 9	Orange to tan gravel cobble CONGLOMERATE, subrounded clasts commonly granitoid and quartzite, moderately graded, massive, slightly friable, dense, moist.	
	Total Depth - 9' No groundwater No caving Backfilled	

Graphic Log

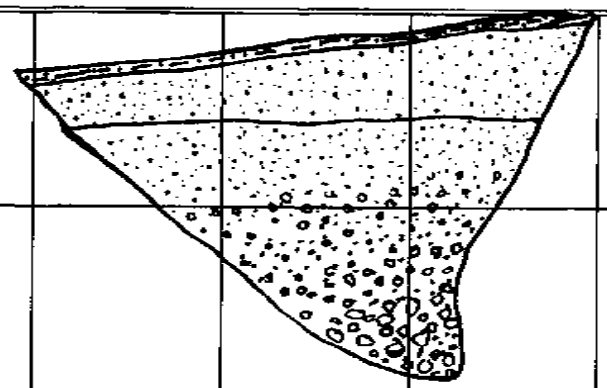


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP38

LOG OF EXCAVATION Trench No. TP39	Logged By: RMP	Date Excavated: 4/19/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 0.5	Topsoil: Very dark brown to black fine to medium grained sandy clayey SILT, moderately graded, soft, moist, abundant roots.	
0.5 - 3	Terrace Deposit: Tan fine to coarse grained SAND, moderately graded, massive, slightly friable, loose, moist, subrounded clasts commonly quartzite, metaigneous, granitoid, well graded, poorly bedded, friable.	
3 - 9.5	Saugus Formation: Orange to tan interbedded fine to coarse grained SANDSTONE and gravel to cobble CONGLOMERATE, subrounded clasts commonly quartzite, metaigneous, granitoid, well graded, bedded, slightly friable, dense, moist, interbeds occur in fining upwards sequences.	@7.5' N62E/19NW
	Total Depth - 9.5' No groundwater No caving Backfilled	

Graphic Log

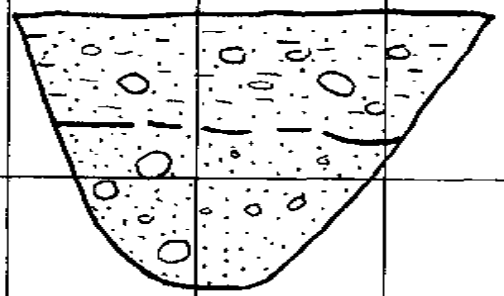


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838.002	PLATE TP39

LOG OF EXCAVATION Trench No. TP40	Logged By: NM	Date Excavated: 5/23/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Dark brown clayey silty SAND with scattered gravels and cobbles, abundant roots, moist, medium dense.	
3 - 7	Mint Canyon Formation: Light brown to grayish brown CONGLOMERATE with medium grained sand matrix, clasts are typically rounded to subrounded gravels and cobbles (approximately 10-15% greater than 12" diameter), some clasts are weathered and gracture with a hammer strike, well graded, moist, very dense.	
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

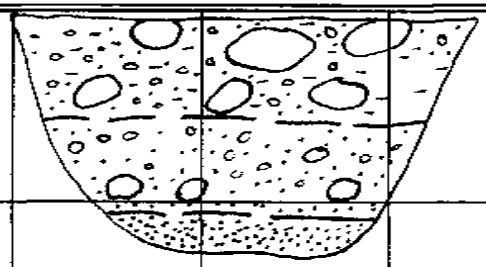


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP40

LOG OF EXCAVATION Trench No. TP41	Logged By: NM	Date Excavated: 5/23/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Alluvium: Dark brown silty sandy CLAY with abundant rounded to subrounded granitic boulders (mostly on surface and upper 2') up to 3' diameter, approximately 25% are boulders, moist, medium stiff, abundant roots, porous.	
3 - 5	Mint Canyon Formation: Light grayish brown CONGLOMERATE with abundant fractured granitic clasts (mostly less than 1' diameter), well graded, moist, very dense.	
5 - 6	Gradational contact with light brown fine to medium grained SANDSTONE with disseminated organic stains, massive, poorly graded, moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

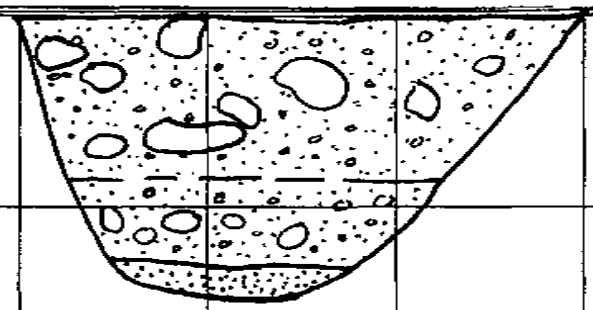


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP41

LOG OF EXCAVATION Trench No. TP42	Logged By: NM	Date Excavated: 5/23/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4	Alluvium: Dark brown sandy silty CLAY with dispersed rounded and subrounded granitic boulders up to 3' diameter (approximately 25% are greater than 12" diameter), very moist, medium stiff, rootlets.	
4 - 6	Dark brown clayey fine to coarse grained SAND with gravels, cobbles, and lesser boulders (less than 10%), well graded, moist, dense.	
6 - 7	Mint Canyon Formation: Sharp undulating contact with light grayish to yelllowish brown medium grained SANDSTONE with occasional coarse sand lenses, moderately graded, moist, very dense.	
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

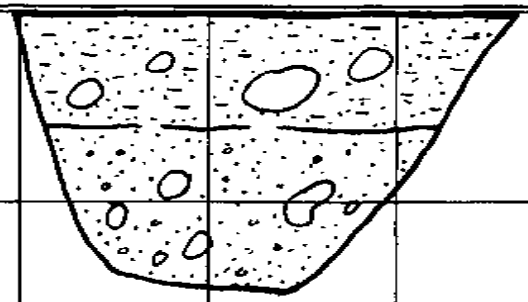


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP42

LOG OF EXCAVATION Trench No. TP43	Logged By: NM	Date Excavated: 5/23/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Colluvium: Dark brown sandy silty CLAY with occasional boulders up to 18" diameter (approximately 10% boulders), rootlets, moist, medium stiff, pinhole porosity.	
3 - 7	Mint Canyon Formation: Light brown to yellowish brown sandy gravel cobble CONGLOMERATE with sparse boulders up to 13" diameter, well graded, subrounded to rounded clasts (mostly granitic with abundant fractures in clasts, moist, very dense.	
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

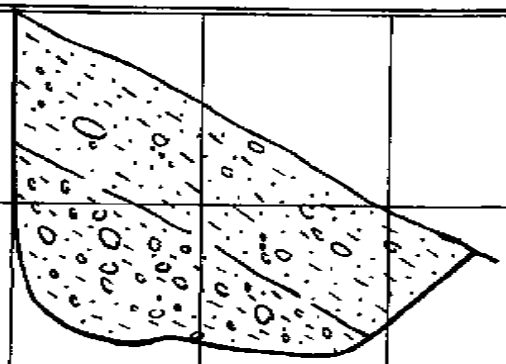


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP43

LOG OF EXCAVATION Trench No. TP44	Logged By: NM	Date Excavated: 5/23/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3.5	Topsoil: Dark brown silty sandy CLAY with occasional cobbles, roots/rootlets, pinhole porosity, moist, medium stiff.	
3.5 - 7	Mint Canyon Formation: Light orangish brown sandy gravel cobble CONGLOMERATE, subangular to rounded clasts, massive, well graded,moist, very dense.	
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

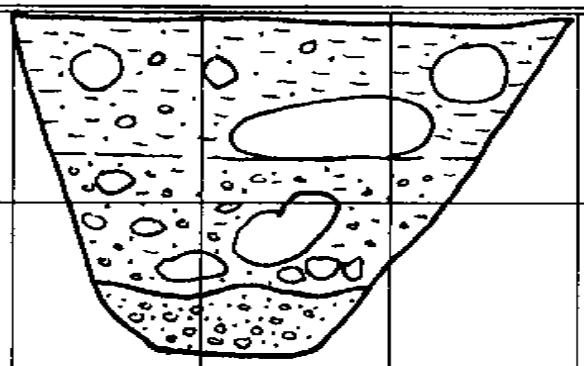


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP44

LOG OF EXCAVATION Trench No. TP45	Logged By: NM	Date Excavated: 5/23/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3.5	Topsoil/Alluvium: Dark brown sandy silty CLAY with sparse boulders and cobbles, typically 1-2' diameter, one 4' diameter boulder at 3-4' depth, moist, medium stiff.	
3.5 - 7	Alluvium: Medium to dark brown silty clayey SAND with dispersed cobbles and boulders (approximately 25-30%), granitic clasts typically 8" to 18" in diameter up to 2', poorly graded at base (higher concentration of boulders).	
7 - 8.5	Mint Canyon Formation: Irregular contact (undulating amplitude approximately 8") with light brown sandy CONGLOMERATE with boulders up to 12" diameter, well graded, moist, very dense.	
	Total Depth - 8.5' No groundwater No caving Backfilled	

Graphic Log

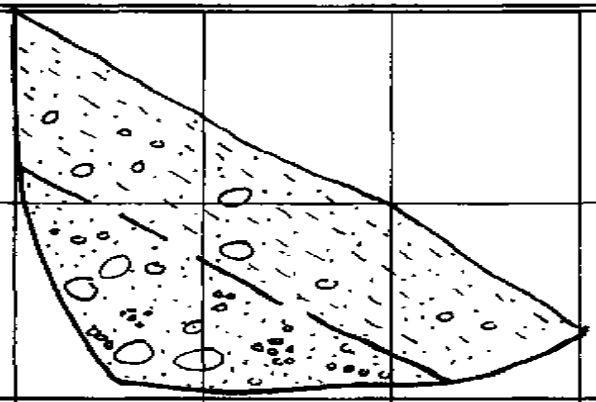


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP45

LOG OF EXCAVATION Trench No. TP46	Logged By: NM	Date Excavated: 5/23/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3.5	Topsoil: Medium to dark brown silty clayey SAND with gravels and lesser cobbles.	
3.5 - 8	Landslide Deposit: Light brown to yellowish brown sandy gravel cobble CONGLOMERATE, approximately 30% sandstone matrix, well graded, massive, moist, very dense, no clasts greater than 12" observed.	
	Total Depth - 8' No groundwater No caving Backfilled	

Graphic Log

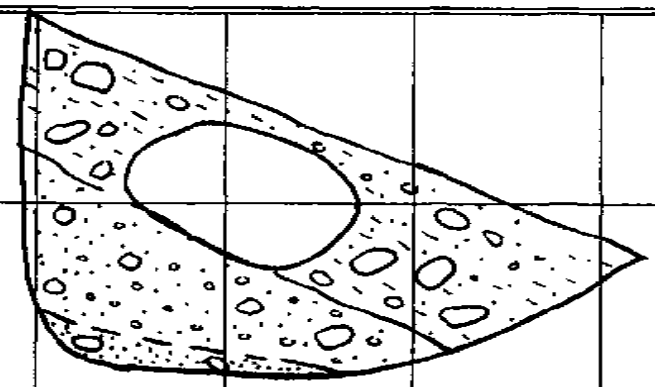


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP46

LOG OF EXCAVATION Trench No. TP47	Logged By: NM	Date Excavated: 5/23/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4	Alluvium: Dark brown silty sandy CLAY with dispersed angular to rounded gravels, cobbles and lesser boulders, typically up to 16" diameter (approximately 10% greater than 12" diameter clasts), single approximately 5' by 3' rounded granitic boulder at surface down to approximately 3.5', moist, medium stiff.	
4 - 7	Landslide Deposit: Light brown to grayish brown sandy gravel cobble CONGLOMERATE with sparse boulders up to 16" diameter (approximately 2-4' apart), well graded, moist, very dense.	
7 - 8	Gradational contact with light brown to light grayish brown fine to medium grained SANDSTONE with gravels and lesser cobbles, moderately graded, massive, moist, very dense.	
	Total Depth - 8' No groundwater No caving Backfilled	

Graphic Log

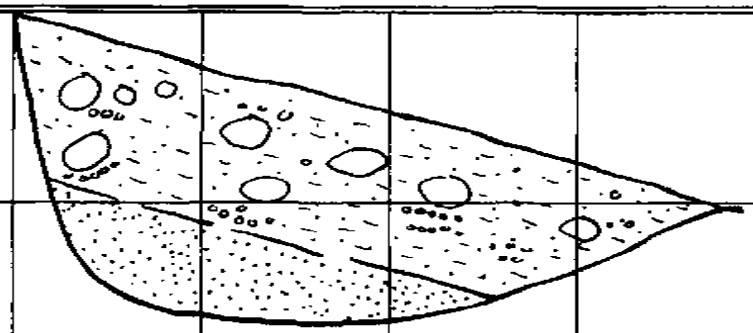


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP47

LOG OF EXCAVATION Trench No. TP48	Logged By: NM	Date Excavated: 5/23/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4	Alluvium: Dark brown clayey fine to coarse grained SAND and gravelly SAND with abundant cobbles and boulders up to 3' diameter, clasts are mostly granitic and subrounded, approximately 50% greater than 12", moist, medium stiff.	
4 - 6.5	Mint Canyon Formation: Light gray fine grained SANDSTONE, poorly graded, massive, discontinuous disseminated organic stringers 1-2cm thick, slightly moist, very dense.	
	Total Depth - 6.5' No groundwater No caving Backfilled	

Graphic Log

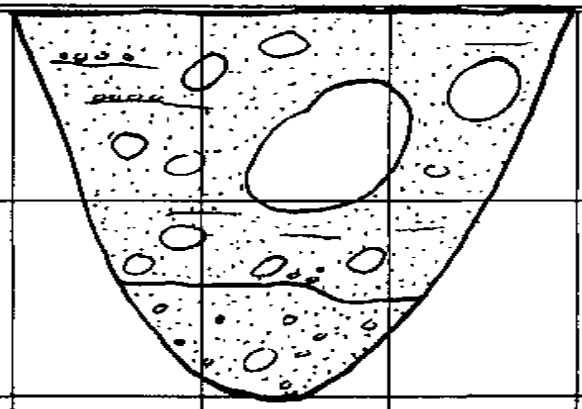


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP48

LOG OF EXCAVATION Trench No. TP49	Logged By: NM	Date Excavated: 5/24/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 7	Alluvium: Medium and light brown clayey silty fine to coarse grained SAND with cobbles and boulders (one up to 4' diameter), crudely bedded, slightly friable at base, moist, medium dense, approximately 35-40% is greater than 12" diameter, typically 12-24".	
7 - 10	Mint Canyon Formation: Light brown sandy CONGLOMERATE with occasional boulders up to approximately 12" diameter, well graded, moist, very dense.	
	Total Depth - 10' No groundwater No caving Backfilled	

Graphic Log

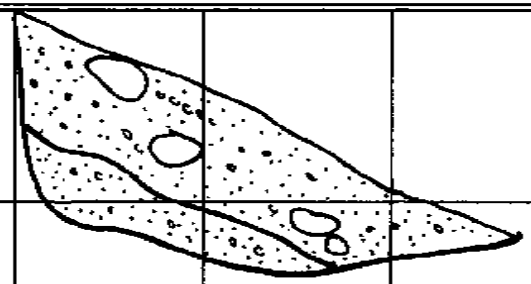


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP49

LOG OF EXCAVATION Trench No. TP50	Logged By: NM	Date Excavated: 5/24/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Dark brown clayey silty fine to coarse grained gravelly SAND with cobbles and boulders up to 2' diameter, approximately 25% greater than 12" diameter, well graded, slightly moist, slightly friable, dense.	
3 - 4.5	Mint Canyon Formation: Light gray fine to coarse grained gravelly SANDSTONE to sandy gravel CONGLOMERATE with cobbles up to 10" diameter, massive, slightly moist, very dense.	
	Total Depth - 4.5' No groundwater No caving Backfilled	

Graphic Log

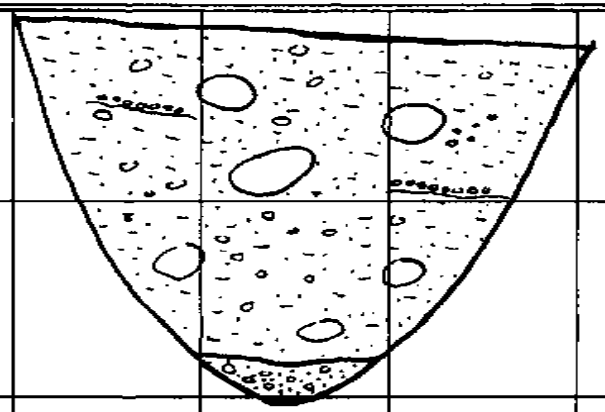


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP50

LOG OF EXCAVATION Trench No. TP51	Logged By: NM	Date Excavated: 5/24/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 8.5	Alluvium: Dark brown fine to coarse grained sandy CLAY and clayey SAND with gravels, cobbles, and lesser boulders (approximately 25% greater than 12" diameter), well graded, moist, medium stiff/medium dense to dense with depth.	
8.5 - 9.5	Mint Canyon Formation: Light gray fine to coarse grained gravel cobble CONGLOMERATE with occasional boulders up to 16" diameter, approximately 5% greater than 12" diameter, moist, very dense.	
	Total Depth - 9.5' No groundwater No caving Backfilled	

Graphic Log

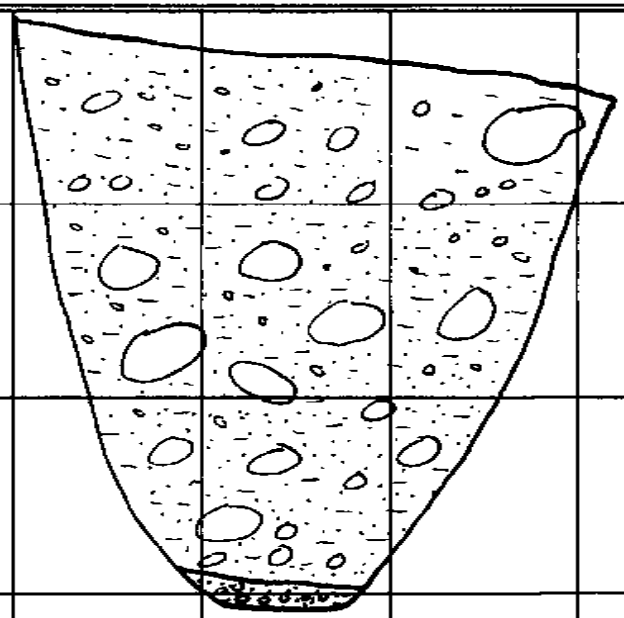


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP51

LOG OF EXCAVATION Trench No. TP52	Logged By: NM	Date Excavated: 5/24/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 13.5	Colluvium: Medium brown clayey silty fine to coarse grained SAND with abundant subangular to rounded gravels, cobbles, and lesser boulders up to 3' diameter (approximately 10-15% greater than 12" diameter), well graded, coarsening with depth, moist, medium dense to dense with depth.	
13.5 - 14	Mint Canyon Formation: Light gray sandy CONGLOMERATE, well graded, moist, very dense.	
	Total Depth - 14' No groundwater No caving Backfilled	

Graphic Log

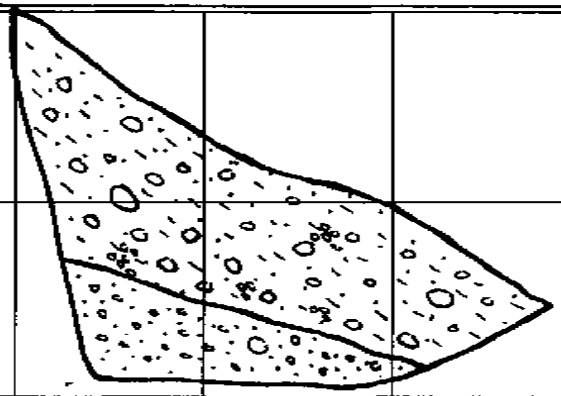


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP52

LOG OF EXCAVATION Trench No. TP53	Logged By: NM	Date Excavated: 5/24/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 7.5	Colluvium: Medium brown silty sandy CLAY and clayey SAND with abundant subangular to rounded gravels and cobbles (no boulders observed), well graded, massive, moist, very stiff.	
7.5 - 9	Mint Canyon Formation: Light gray sandy gravel CONGLOMERATE, slightly moist, very dense.	
	Total Depth - 9' No groundwater No caving Backfilled	

Graphic Log

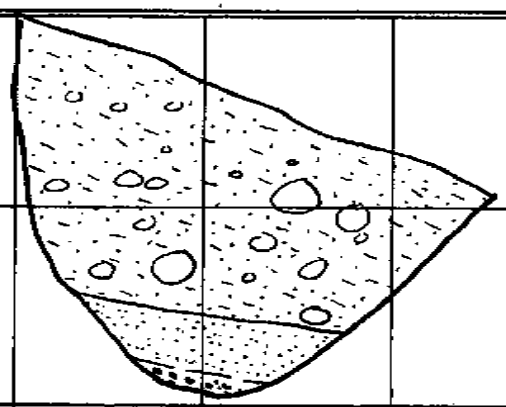


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP53

LOG OF EXCAVATION Trench No. TP54	Logged By: NM	Date Excavated: 5/24/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 6.5	Colluvium: Medium brown silty clayey SAND with gravels and scattered cobbles and boulders up to 14" diameter (approximately 5% greater than 12"), well graded, massive, occasional pinhole porosity, moist, medium dense.	
6.5 - 8.5	Mint Canyon Formation: Light gray fine to medium grained SANDSTONE, poorly graded, massive, moist, very dense.	
@8'	Approximate horizontal contact with gravel CONGLOMERATE.	
	Total Depth - 8.5' No groundwater No caving Backfilled	

Graphic Log

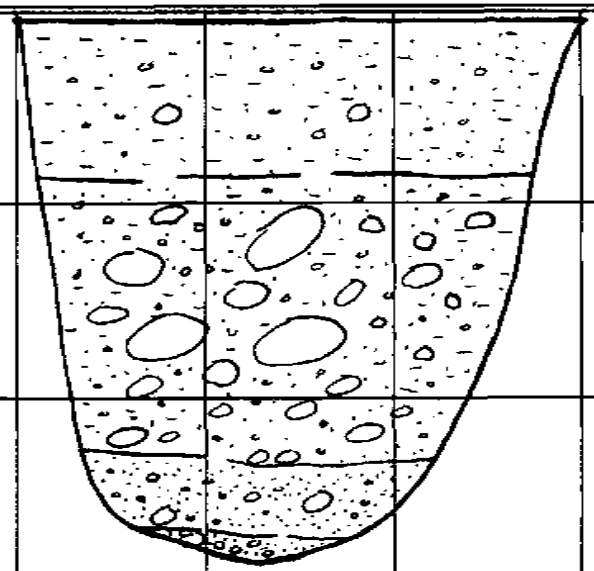


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP54

LOG OF EXCAVATION Trench No. TP55	Logged By: NM	Date Excavated: 5/24/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4	Topsoil: Dark brown sandy CLAY to clayey SAND with gravels and lesser cobbles, massive, pinhole porosity, moist, medium stiff to medium dense.	
4 - 11.5	Alluvium: Medium brown silty clayey gravelly SAND with abundant cobbles and boulders, typically 1-2' diameter up to 3', subangular to rounded clasts, well graded, approximately 35% greater than 12" diameter.	
11.5 - 13.5	Light brown medium to coarse grained SAND with gravels, cobbles, and lesser boulders (approximately 10% up to 1' diameter, low amount of fines, slightly friable, moist, dense to very dense.	
13.5 - 14	Mint Canyon Formation: Light gray sandy CONGLOMERATE, massive, moist, very dense.	
	Total Depth - 14' No groundwater No caving Backfilled	

Graphic Log

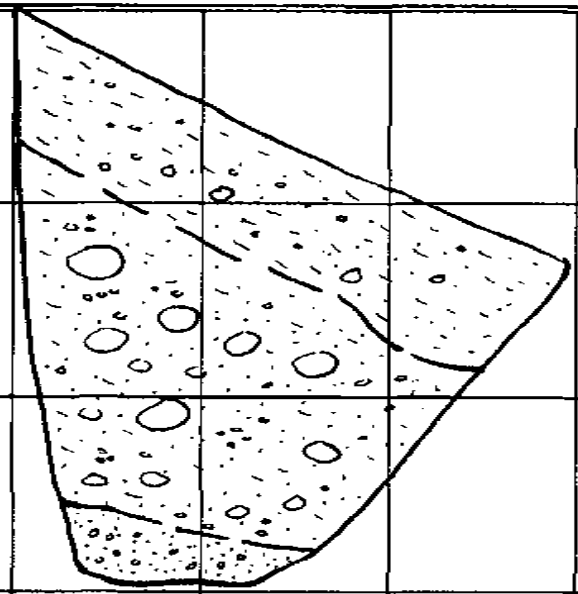


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP55

LOG OF EXCAVATION Trench No. TP56	Logged By: NM	Date Excavated: 5/24/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Topsoil: Dark brown silty clayey SAND with gravels and occasional cobbles, porous, rootlets, moist, medium dense.	
3 - 12	Alluvium: Light brown clayey silty SAND with subrounded to rounded gravels, cobbles, and lesser boulders up to 2' diameter (approximately 20% greater than 12" diameter), well graded, moist, dense.	
12 - 13.5	Mint Canyon Formation: Light gray brown sandy gravel cobble CONGLOMERATE, moist, very dense, occasional oxidation stains.	
	Total Depth - 13.5' No groundwater No caving Backfilled	

Graphic Log

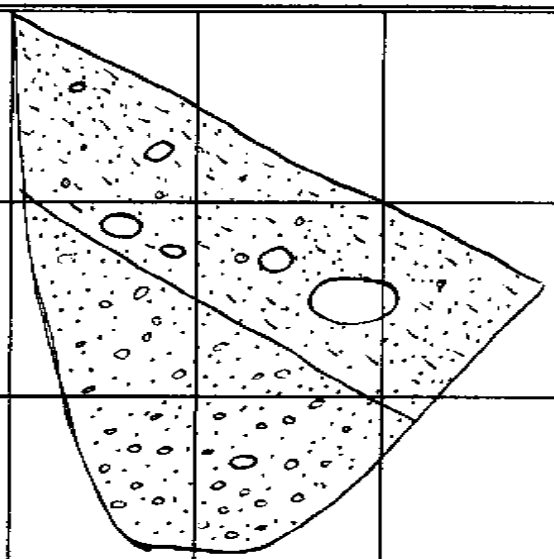


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP56

LOG OF EXCAVATION Trench No. TP57	Logged By: NM	Date Excavated: 5/25/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 5	Colluvium: Dark brown silty clayey SAND with gravels and occasional cobbles and boulders (approximately 5% greater than 12" diameter and one clast up to 2' diameter), moist, medium dense.	
5 - 12.5	Mint Canyon Formation: Light gray fine to medium grained gravelly SANDSTONE with dispersed cobbles, well graded, massive, moist to very moist, very dense.	
	Total Depth - 12.5' No groundwater No caving Backfilled	

Graphic Log

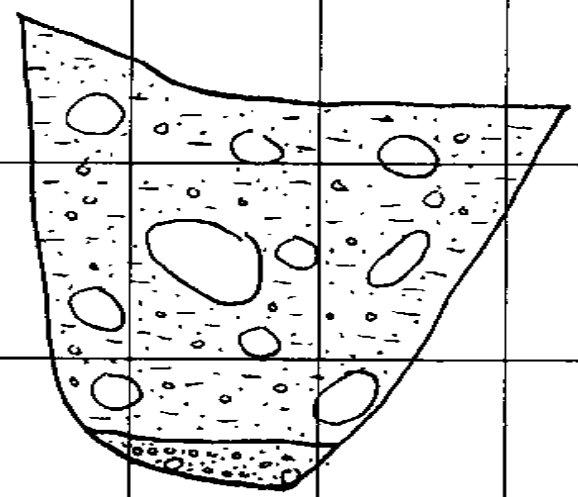


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP57

LOG OF EXCAVATION Trench No. TP58	Logged By: NM	Date Excavated: 5/25/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 8	Alluvium: Dark brown fine to coarse grained sandy CLAY with abundant gravels, cobbles and lesser boulders (approximately 30% greater than 12" diameter), well graded, moist to very moist, medium stiff.	
8 - 10	Mint Canyon Formation: Light gray fine to coarse grained gravel cobble CONGLOMERATE with occasional boulders approximately 12" diameter, well graded, moist, very dense.	
	Total Depth - 10' No groundwater No caving Backfilled	

Graphic Log

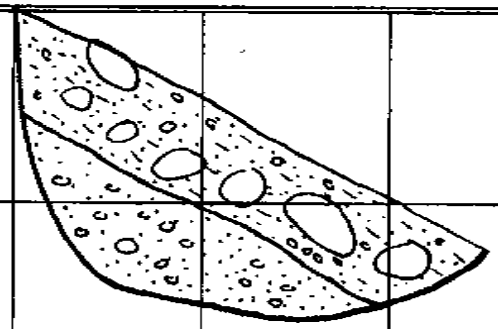


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP58

LOG OF EXCAVATION Trench No. TP59	Logged By: NM	Date Excavated: 5/25/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Colluvium: Medium brown silty SAND with gravels and abundant cobbles and boulders (approximately 35% greater than 12" diameter), clasts are subangular to rounded, typically 12"-18" diameter up to 2', well graded, moist, medium dense.	
3 - 6	Mint Canyon Formation; Light gray sandy gravel cobble CONGLOMERATE, well graded, massive, slightly moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

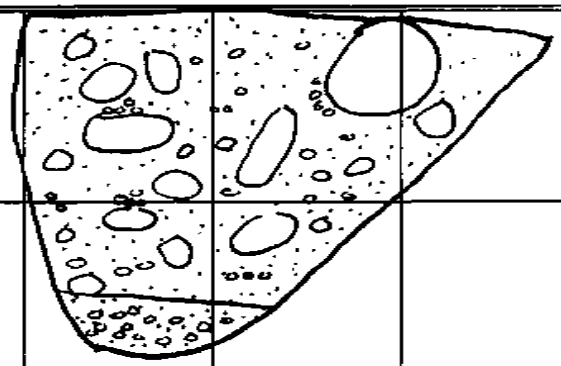


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP59

LOG OF EXCAVATION Trench No. TP60	Logged By: NM	Date Excavated: 5/25/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 7.5	Alluvium: Medium brown silty SAND with abundant gravels, cobbles, and boulders (30% greater than 12" diameter), well graded, slightly moist, medium dense, several clasts up to 3' diameter.	
7.5 - 9	Mint Canyon Formation: Light gray gravel cobble CONGLOMERATE, well graded, slightly moist, very dense.	
	Total Depth - 9' No groundwater No caving Backfilled	

Graphic Log

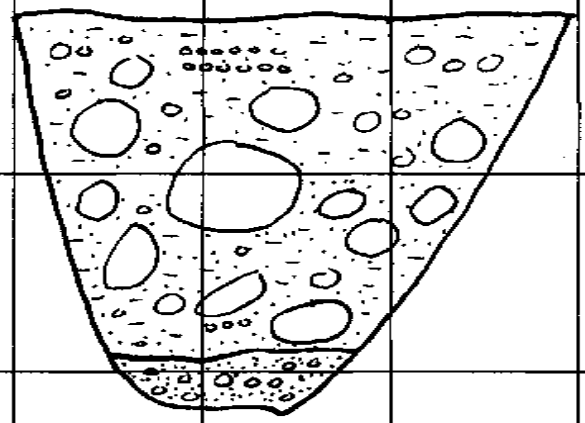


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP60

LOG OF EXCAVATION Trench No. TP61	Logged By: NM	Date Excavated: 5/25/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 8.5	Alluvium: Medium brown silty SAND and fine to coarse grained SAND with abundant gravels, cobbles, and lesser boulders (approximately 35% greater than 12" diameter), subangular to rounded clasts typically 18" to 24" diameter, well graded, moist to very moist at depth, slightly friable, medium dense.	
8.5 - 10	Mint Canyon Formation: Light gray sandy gravel cobble CONGLOMERATE with occasional boulders (typically 12" to 16" diameter), well graded, moist to very moist, very dense.	
	Total Depth - 10' No groundwater No caving Backfilled	

Graphic Log

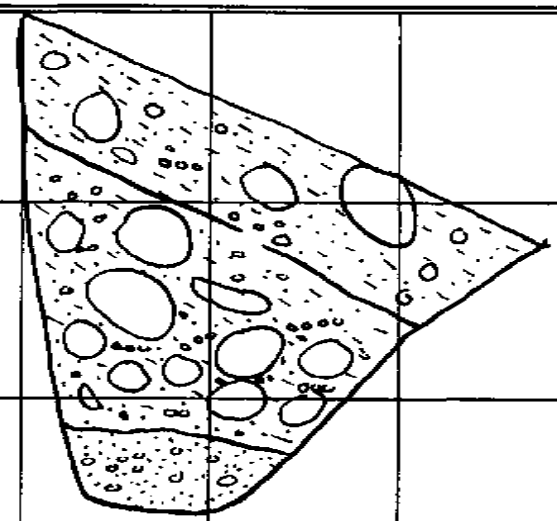


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP61

LOG OF EXCAVATION Trench No. TP62	Logged By: NM	Date Excavated: 5/25/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Topsoil: Dark brown silty clayey SAND with gravels and occasional boulders up to 2' diameter (approximately 10% greater than 12" diameter), porous, abundant roots, slightly moist, medium dense.	
3 - 9	Colluvium: Medium brown clayey SAND with abundant gravels, cobbles, and boulders (approximately 35% greater than 12" diameter, up to 3' diameter), subrounded to rounded clasts typically 12" to 18" diameter, well graded, moist, medium dense.	
9 - 11.5	Mint Canyon Formation: Light gray brown sandy gravel cobble CONGLOMERATE, moist, very dense.	
	Total Depth - 11.5' No groundwater No caving Backfilled	

Graphic Log

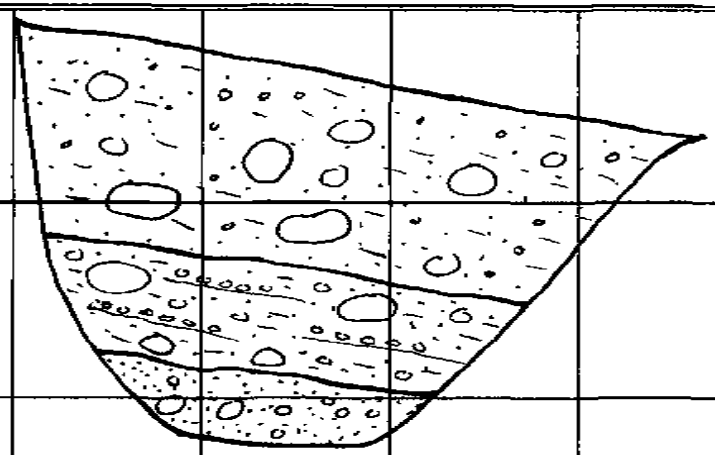


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP62

LOG OF EXCAVATION Trench No. TP63	Logged By: NM	Date Excavated: 5/25/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 5	Colluvium: Medium brown clayey SAND with gravels and lesser cobbles and boulders (approximately 15% greater than 12" diameter), angular to rounded clasts typically 6" to 12" diameter, poorly sorted, moist, medium dense.	
5 - 8	Light gray brown fine to coarse grained SAND with coarse gravel, occasional boulders up to 18" diameter (approximately 20% greater than 12" diameter), occasional crude laminations, well graded, very moist, seepage at base of unit.	
8 - 10	Mint Canyon Formation: Light gray brown sandy cobble CONGLOMERATE (sandstone matrix supported), massive, very moist, very dense.	
	Total Depth - 10' Seep at 8' (bottom of colluvium) No caving Backfilled	

Graphic Log

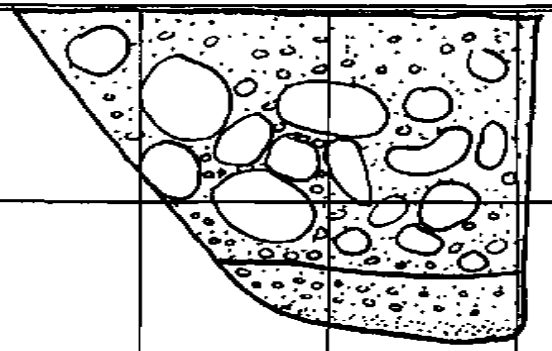


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP63

LOG OF EXCAVATION Trench No. TP64	Logged By: NM	Date Excavated: 5/25/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 6.5	Alluvium: Medium brown silty clayey SAND with abundant gravels, cobbles, and boulders (approximately 50% greater than 12" diameter), boulders are typically 2' to 2.5' diameter (closely spaced), well graded, very moist to wet at base (seepage in bottom ±6" to 12"), loose to medium dense, bottom 2' is coarse grained.	
6.5 - 8	Mint Canyon Formation: Light gray brown fine to coarse grained sandy gravel CONGLOMERATE to fine grained SANDSTONE, very moist, very dense.	
	Total Depth - 8' Seep at 6.5' (bottom of alluvium) No caving Backfilled	

Graphic Log

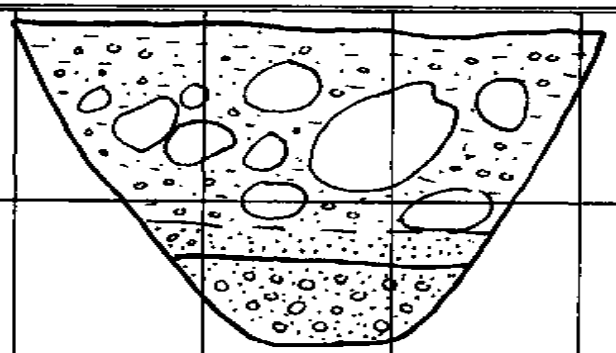


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP64

LOG OF EXCAVATION Trench No. TP65	Logged By: NM	Date Excavated: 5/25/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 6	Alluvium: Medium brown silty clayey SAND with abundant gravels, cobbles, and boulders (occasionally up to 3.5' diameter, approximately 55% greater than 12" diameter), bottom 12" is coarse grained SAND with seepage at base.	
6 - 8	Mint Canyon Formation: Light gray brown sandy gravel cobble CONGLOMERATE, very moist, very dense.	
	Total Depth - 8' Seep at 6' (bottom of alluvium) No caving Backfilled	

Graphic Log

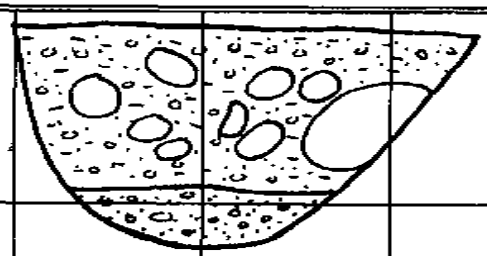


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP65

LOG OF EXCAVATION Trench No. TP66	Logged By: NM	Date Excavated: 5/25/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4	Alluvium: Medium brown silty SAND with abundant gravels, cobbles, and boulders (approximately 20% greater than 12" diameter), occasional clasts up to 3' diameter, well graded, loose to medium dense, wet in bottom 12", continuous slow seepage at base (bottom 12" is coarse grained).	
4 - 5.5	Mint Canyon Formation: Light gray brown sandy gravel cobble CONGLOMERATE, very moist, very dense.	
	Total Depth - 5.5' Seep at 4' (bottom of alluvium) No caving Backfilled	

Graphic Log

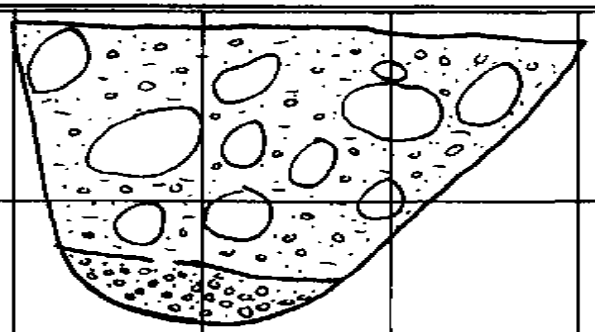


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP66

LOG OF EXCAVATION Trench No. TP67	Logged By: NM	Date Excavated: 5/26/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 6	Alluvium: Medium brown silty SAND with abundant gravels, cobbles, and boulders (approximately 35% greater than 12" diameter), subrounded to rounded clasts up to 3' diameter, well graded, moist to very moist at base, medium dense, minor seepage at base (bedrock contact).	
6 - 7.5	Mint Canyon Formation: Light gray coarse grained gravel CONGLOMERATE, very moist, very dense.	
	Total Depth - 7.5' Seep at 6' (bottom of alluvium) No caving Backfilled	

Graphic Log

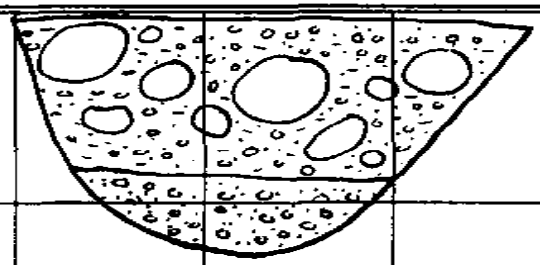


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP67

LOG OF EXCAVATION Trench No. TP68	Logged By: NM	Date Excavated: 5/26/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4	Alluvium: Medium brown silty SAND with abundant gravels, cobbles, and boulders (approximately 35% greater than 12" diameter), subangular to rounded clasts typically 1-2" diameter up to 3', well graded, moist, medium dense.	
4 - 6	Mint Canyon Formation: Light gray sandy gravel cobble CONGLOMERATE (sandstone matrix supported), moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

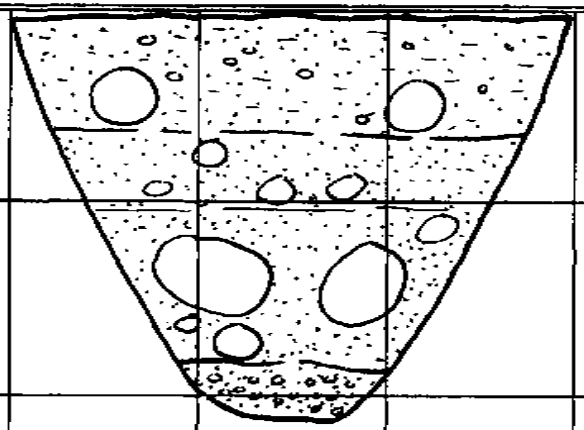


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP68

LOG OF EXCAVATION Trench No. TP69	Logged By: NM	Date Excavated: 5/26/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Topsoil: Medium brown silty SAND with gravels and occasional cobbles and boulders (approximately 15% greater than 12" diameter), slightly moist, medium dense.	
3 - 9	Alluvium: Medium brown coarse grained gravelly SAND with abundant cobbles and boulders (approximately 25% greater than 12" diameter), well graded, subangular to rounded clasts typically 6" to 18" diameter (up to 3'), moist to wet at 8', medium dense.	
9 - 10.5	Mint Canyon Formation: Light gray gravel cobble CONGLOMERATE with sandstone supported matrix, very moist, very dense.	
	Total Depth - 10.5' Seep at 9' (bottom of alluvium) No caving Backfilled	

Graphic Log

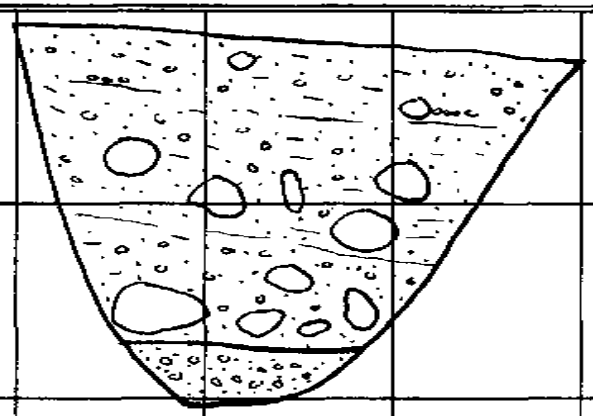


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP69

LOG OF EXCAVATION Trench No. TP70	Logged By: NM	Date Excavated: 5/26/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 8	Alluvium: Medium brown silty clayey fine to coarse grained gravelly SAND with cobbles and lesser boulders (approximately 15% greater than 12" diameter), well graded, at 6' becoming very moist to wet, medium dense.	
8 - 9.5	Mint Canyon Formation: Light gray gravel cobble CONGLOMERATE with occasional boulders (approximately 12" diameter), moist, very dense.	
	Total Depth - 9.5' Wet from 6'-8' No caving Backfilled	

Graphic Log

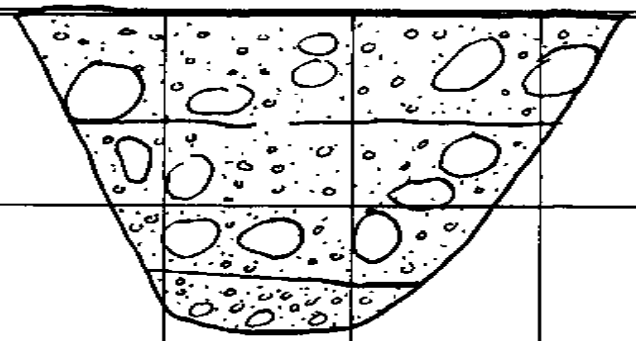


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP70

LOG OF EXCAVATION Trench No. TP71	Logged By: NM	Date Excavated: 5/26/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Light grayish brown sandy GRAVEL with abundant cobbles and boulders up to 3' diameter, typically 6" to 18" (approximately 25% greater than 12" diameter), medium dense to loose, slightly moist.	
3- 6.5	Medium brown clayey coarse grained gravelly SAND with abundant cobbles and boulders (approximately 35% greater than 12" diameter), clasts typically 8" to 18" diameter up to 3' (observed 5 at this size), well graded, very moist to wet at base (slow seepage at base).	
6.5 - 8	Mint Canyon Formation: Light gray sandy gravel cobble CONGLOMERATE, fine to medium sandstone matrix, very moist, very dense.	
	Total Depth - 8' Seep at 6.5' (bottom of alluvium) No caving Backfilled	

Graphic Log

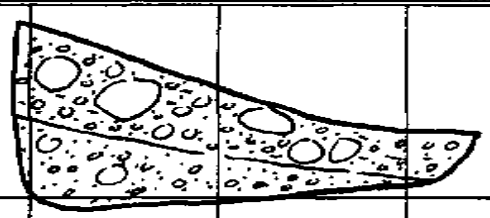


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP71

LOG OF EXCAVATION Trench No. TP72	Logged By: NM	Date Excavated: 5/26/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown silty fine grained SAND with abundant gravels, cobbles and lesser boulders (approximately 10% greater than 12" diameter) up to 24", matrix supported, well graded, wet, medium dense, continuous seepage at base.	
3 - 4	Mint Canyon Formation: Light gray to greenish gray sandy gravel cobble CONGLOMERATE, very moist, very dense.	
	Total Depth - 4' Seep at 3' (bottom of alluvium) No caving Backfilled	

Graphic Log

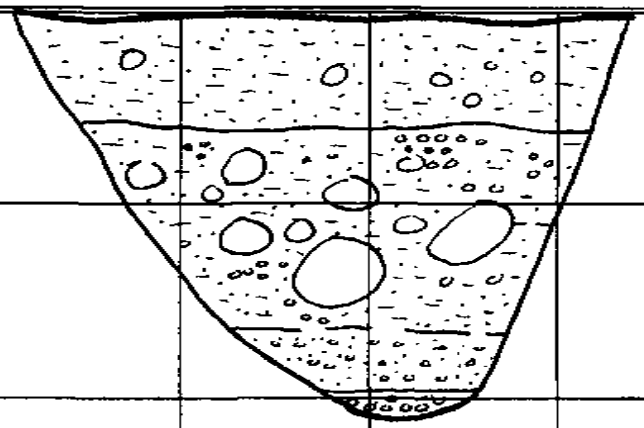


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP72

LOG OF EXCAVATION Trench No. TP73	Logged By: NM	Date Excavated: 5/26/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Topsoil: Dark brown silty fine grained SAND with occasional gravels and cobbles, porous, abundant roots, moist, medium dense.	
3 - 8	Alluvium: Medium brown silty fine to coarse grained SAND with abundant gravels, cobbles, and boulders (approximately 35% greater than 12" diameter), subangular to rounded clasts up to 3' diameter, poorly sorted, slightly friable, moist, medium dense.	
8 - 10	Medium brown coarse grained SAND with gravels and cobbles (low amount of fines), well graded, friable, wet, dense, minor seepage at base.	
10 - 11	Mint Canyon Formation: Light greenish gray to light gray sandy gravel CONGLOMERATE, very moist, very dense.	
	Total Depth - 11' Seep at 10' (bottom of alluvium) No caving Backfilled	

Graphic Log

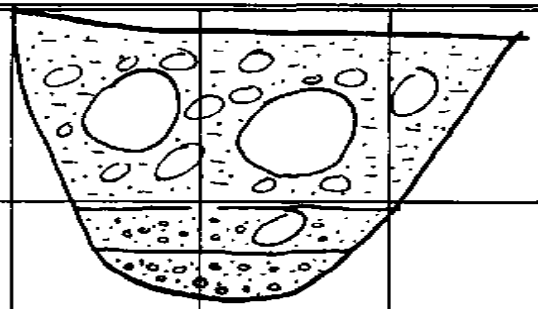


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP73

LOG OF EXCAVATION Trench No. TP74	Logged By: NM	Date Excavated: 5/26/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4.5	Alluvium: Medium brown silty fine to coarse grained SAND with abundant gravels, cobbles, and boulders approximately 40% greater 12" diameter), several large rounded boulders up to 3.5' diameter, well graded, moist, medium dense to dense.	
4.5 - 5.5	Medium brown coarse grained gravelly SAND with occasional cobbles and boulders approximately 12" diameter, friable, water seeping at base, wet, dense.	
5.5 - 6.5	Mint Canyon Formation: Light greenish gray sandy gravel cobble CONGLOMERATE, very moist to wet, very dense, orange oxidation stains.	
	Total Depth - 6.5' Seep at 5.5' (bottom of alluvium) No caving Backfilled	

Graphic Log

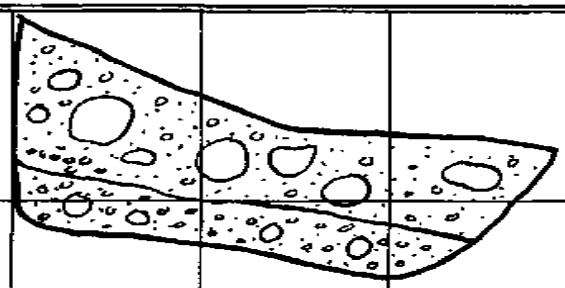


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP74

LOG OF EXCAVATION Trench No. TP75	Logged By: NM	Date Excavated: 5/26/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3.5	Alluvium: Medium brown silty fine to coarse grained SAND with abundant gravels, cobbles, and lesser boulders (approximately 20% greater than 12" diameter), well graded, very moist to wet at base, bottom 12" is silty coarse grained gravelly SAND, seepage at base, clasts typically 1' diameter and as coarse as 2' diameter.	
3.5 - 5	Mint Canyon Formation: Light gray sandy gravel cobble CONGLOMERATE, very moist to wet, very dense.	
	Total Depth - 5' Seep at 3.5' (bottom of alluvium) No caving Backfilled	

Graphic Log

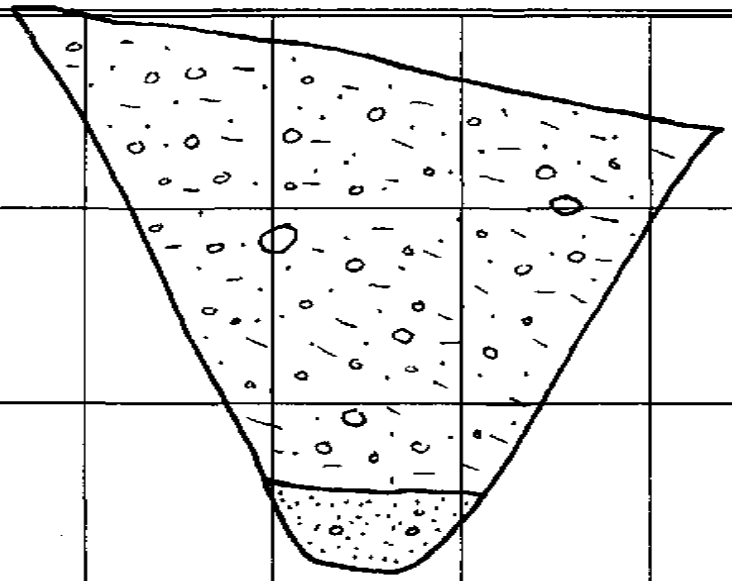


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP75

LOG OF EXCAVATION Trench No. TP76	Logged By: NM	Date Excavated: 5/26/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 11	Colluvium: Light medium brown fine to medium grained silty SAND with gravels and cobbles (approximately 20%), moderately graded, massive, rootlets down to 8', moist, medium dense (no boulders observed).	
11 - 13	Mint Canyon Formation: Light greenish gray fine grained SANDSTONE with occasional cobbles and gravels, poorly graded, moist, very dense.	
	Total Depth - 13' No groundwater No caving Backfilled	

Graphic Log

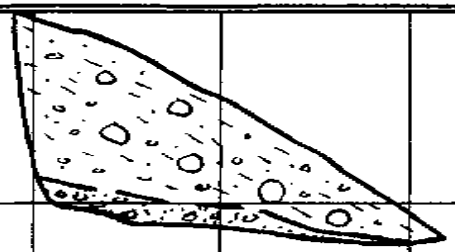


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP76

LOG OF EXCAVATION Trench No. TP77	Logged By: NM	Date Excavated: 5/26/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark brown sandy CLAY, rootlets, occasional gravels, porous, slightly moist, medium stiff.	
1 - 4	Colluvium: Medium brown silty fine to medium grained SAND with gravels and cobbles up to 12" diameter (approximately 25% is coarse grained cobble), massive, slightly moist, medium dense.	
4 - 5.5	Mint Canyon Formation: Light greenish gray fine to medium grained SANDSTONE with occasional gravels, cobbles, moderately graded, moist, very dense.	
	Total Depth - 5.5' No groundwater No caving Backfilled	

Graphic Log

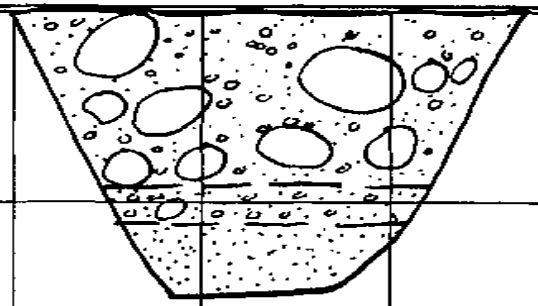


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP77

LOG OF EXCAVATION Trench No. TP78	Logged By: NM	Date Excavated: 5/26/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4.5	Alluvium: Medium brown silty SAND with abundant subangular to rounded gravels, cobbles and boulders (approximately 50% greater than 12" diameter), up to 3' diameter, boulders typically 1-2' diameter, well graded, moist, medium dense.	
4.5 - 5.5	Medium brown clayey coarse grained gravelly SAND with cobbles and lesser boulders up to 1' diameter, clasts are angular to rounded, low % of fines, well graded, very moist, dense.	
5.5 - 7	Mint Canyon Formation: Light greenish gray fine to very fine grained SANDSTONE, poorly graded, massive, moist, very dense.	
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

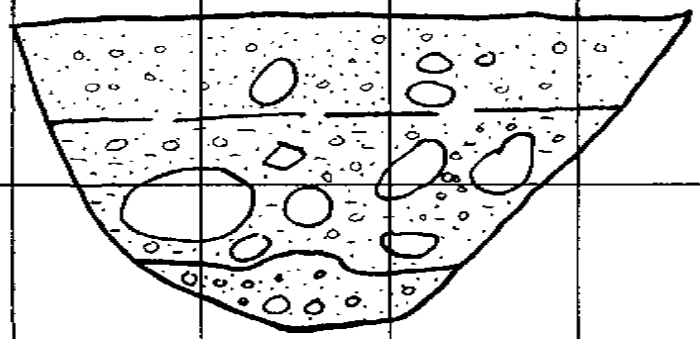


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP78

LOG OF EXCAVATION Trench No. TP79	Logged By: NM	Date Excavated: 6/1/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Alluvium: Light brown fine to coarse grained gravelly SAND with abundant cobbles and boulders (approximately 5% greater than 1' diameter), well graded, clasts are typically 3" to 1' diameter, friable, moist, medium dense.	
2.5 - 6	Medium brown silty fine to medium grained gravelly SAND with abundant cobbles and boulders (approx. 15% greater than 1' diameter) up to approximately 3' diameter, clasts are typically 6" to 1' diameter and are subrounded to rounded (mostly granitic), well graded, moist, medium dense.	
6 - 8	Mint Canyon Formation: Light greenish gray conglomeratic SANDSTONE with occasional cobbles, well graded, massive, moist, very dense.	
	Total Depth - 8' No groundwater No caving Backfilled	

Graphic Log

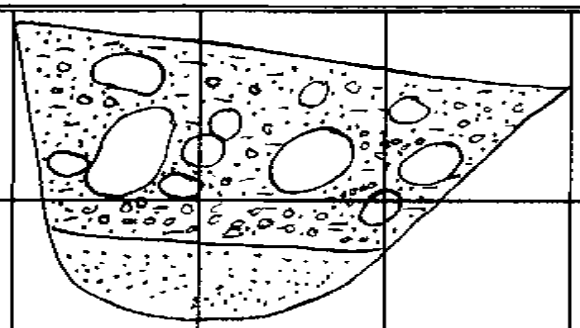


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP79

LOG OF EXCAVATION Trench No. TP80	Logged By: NM	Date Excavated: 6/1/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 5	Alluvium: Medium brown silty fine to coarse grained gravelly SAND with abundant subangular to rounded cobbles and boulders (approximately 15% greater than 1' diameter), occasional pockets of clean gravelly SAND, well graded, clasts typically a few inches to 1' diameter and up to 2.5' diameter, friable, moist, medium dense.	
5 - 7	Mint Canyon Formation: Grayish green to greenish gray fine to medium grained SANDSTONE with occasional white calcium carbonate stringers, poorly graded, occasional blocky planar randomly oriented fractures, moist to very moist, very dense.	
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

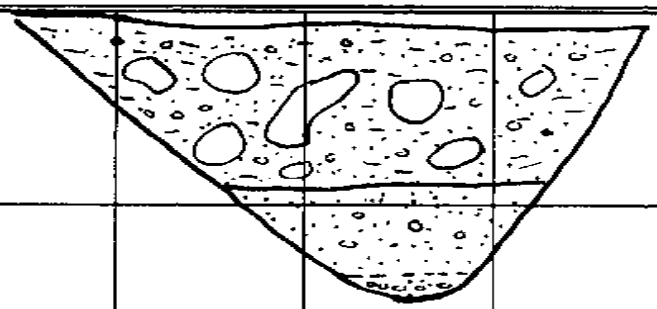


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP80

LOG OF EXCAVATION Trench No. TP81	Logged By: NM	Date Excavated: 6/1/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4	Colluvium: Medium brown silty fine grained SAND with subangular to rounded gravels, cobbles and boulders (approximately 10% greater than 1' diameter), clasts typically 1-2' diameter, well graded, moist, medium dense.	
4 - 7.5	Mint Canyon Formation: Light greenish gray fine to medium grained SANDSTONE with dispersed gravels and cobbles, moderately graded, faint gradational contact at 7' to sandy CONGLOMERATE, calcium carbonate stringers, moist, very dense.	
	Total Depth - 7.5' No groundwater No caving Backfilled	

Graphic Log

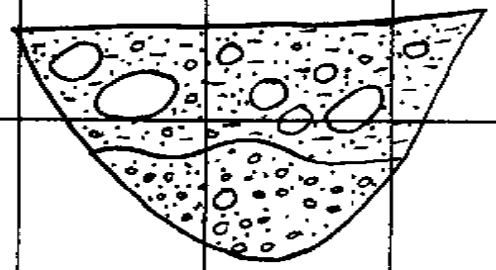


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP81

LOG OF EXCAVATION Trench No. TP82	Logged By: NM	Date Excavated: 6/1/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown silty fine to coarse grained SAND with gravels, cobbles, and boulders (approximately 10% greater than 1' diameter), clasts up to 2' diameter, well graded, very moist to wet with depth, continuous seepage at base, medium dense.	
3 - 6	Mint Canyon Formation: Light gray sandy gravel CONGLOMERATE with lesser cobbles and boulders (one or two up to approximately 14" diameter), very moist to wet, very dense.	
	Total Depth - 6' Seep at 3' (bottom of alluvium) No caving Backfilled	

Graphic Log

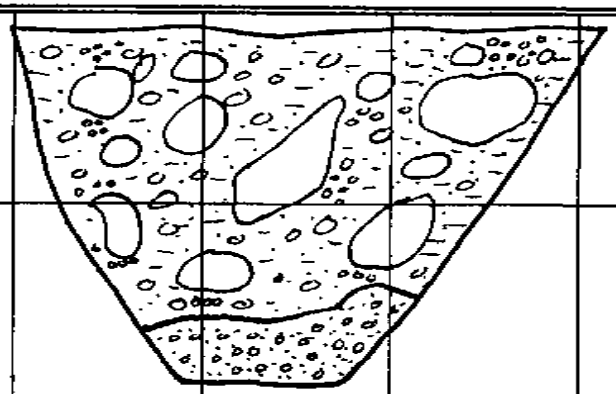


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP82

LOG OF EXCAVATION Trench No. TP83	Logged By: NM	Date Excavated: 6/1/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 7	Alluvium: Medium to light brown silty fine to coarse grained gravelly SAND with abundant subangular to rounded cobbles and boulders (20% greater than 1' diameter), well graded, slightly friable, moist to very moist with depth, medium dense.	
7 - 9	Mint Canyon Formation: Light green gray sandy gravel CONGLOMERATE, very moist, very dense, sandstone matrix supported.	
	Total Depth - 9' No groundwater No caving Backfilled	

Graphic Log

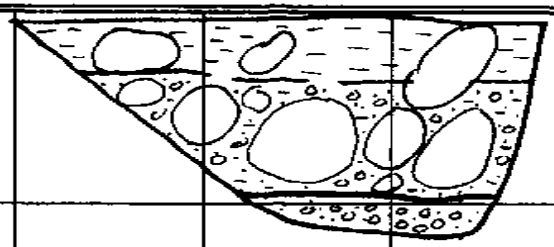


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP83

LOG OF EXCAVATION Trench No. TP84	Logged By: NM	Date Excavated: 6/1/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Topsoil: Dark brown clayey sandy SILT with dispersed gravels, cobbles and boulders (2 clasts up to 2' diameter), abundant rootlets, porous, slightly moist, medium stiff (approx. 35% greater than 1' diameter).	
1.5 - 4	Alluvium: Medium brown silty fine to medium grained SAND and gravelly SAND with abundant cobbles and boulders (approximately 35% greater than 1' diameter, 3 boulders as coarse as approximately 3' diameter), well graded, slightly friable, moist, medium dense.	
4 - 5.5	Mint Canyon Formation: Light greenish gray gravel cobble CONGLOMERATE with fine to medium grained sandstone matrix, well graded, slightly moist, very dense.	
	Total Depth - 5.5' No groundwater No caving Backfilled	

Graphic Log

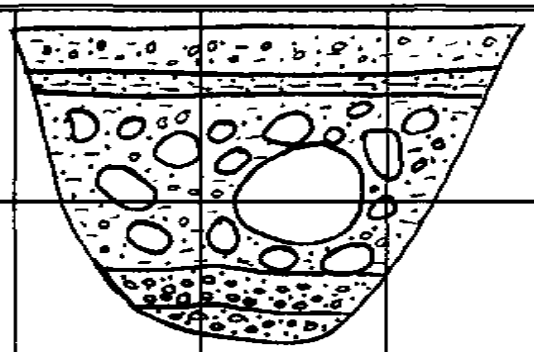


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP84

LOG OF EXCAVATION Trench No. TP85	Logged By: NM	Date Excavated: 6/1/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Medium brown silty fine to medium grained SAND with gravels and cobbles, well graded, rootlets, dry, medium dense.	
1 - 1.5	Burn Horizon?: Black silty fine grained SAND to sandy SILT with coarse sand and gravels, organic rich, abundant rootlets, porous, dry, medium dense to medium stiff.	
1.5 - 6	Alluvium: Medium brown silty fine to coarse grained gravelly SAND to sandy GRAVEL with abundant cobbles and boulders (approximately 20% greater than 1' diameter), well graded, angular to rounded clasts typically a few inches to approximately 1' diameter, slightly friable, slightly moist, medium dense.	
6 - 7	Light brown coarse grained sandy GRAVEL, well graded, friable, slightly moist, dense.	
7 - 8	Mint Canyon Formation: Light greenish gray sandy CONGLOMERATE, sandstone matrix supported, slightly moist, very dense.	
	Total Depth - 8' No groundwater No caving Backfilled	

Graphic Log

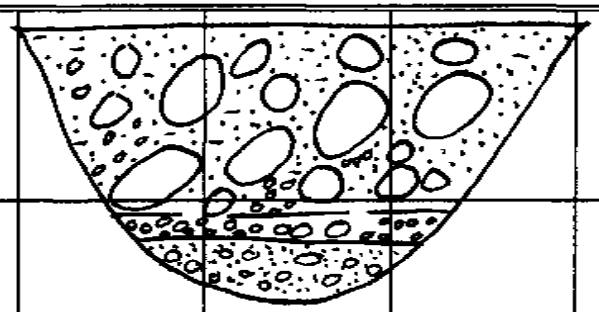


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP85

LOG OF EXCAVATION Trench No. TP86	Logged By: NM	Date Excavated: 6/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 5	Alluvium: Medium brown silty sandy GRAVEL with abundant cobbles and boulders (approximately 30% greater than 1' diameter), subangular to rounded granitic clasts typically a few inches to approx. 1' diameter up to approx. 2' diameter, predominantly cobbles and boulders (clast supported), well graded, moist to very moist with depth, medium dense.	
5 - 5.5	Medium brown coarse grained sandy GRAVEL with occasional cobbles, well graded, low % of fines, wet, continuous seepage at base.	
5.5 - 7	Mint Canyon Formation: Light greenish gray coarse grained sandy gravel CONGLOMERATE, very moist to wet, very dense, difficult to excavate.	
	Total Depth - 7' Seep at 5.5' (bottom of alluvium) No caving Backfilled	

Graphic Log

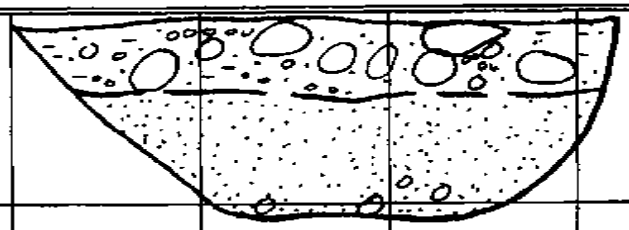


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP86

LOG OF EXCAVATION Trench No. TP87	Logged By: NM	Date Excavated: 6/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Alluvium: Medium brown silty fine to coarse grained SAND with gravels, cobbles, and boulders (approx. 15% greater than 1' diameter), subangular to rounded clasts typically a few inches to 1' diameter up to approx. 1.5' diameter, well graded, slightly moist to very moist at base, medium dense.	
2 - 5	Mint Canyon Formation: Light grayish green fine to medium grained SANDSTONE, poorly graded, massive, very moist, very dense, sparse cobbles in bottom 6".	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

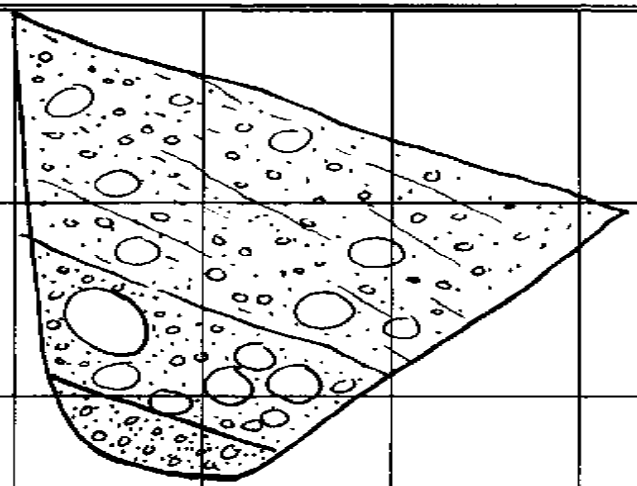


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP87

LOG OF EXCAVATION Trench No. TP88	Logged By: NM	Date Excavated: 6/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 6	Colluvium: Medium brown silty fine to medium grained SAND with scattered coarse sand, gravels, and lesser cobbles, matrix supported, crudely bedded, dipping gently toward canyon, moist, medium dense, porous, abundant rootlets.	
6 - 9	Alluvium: Medium brown silty fine to coarse grained gravelly SAND with abundant cobbles and boulders (approx. 10% greater than 1' diameter), subangular to rounded clasts typically a few inches to 1' diameter up to approx. 1.5' diameter, occasional pockets of friable medium to coarse sand, well graded, moist, medium dense.	
9 - 10.5	Mint Canyon Formation: Light greenish gray gravel to cobble CONGLOMERATE, massive, moist, very dense.	
	Total Depth - 10.5' No groundwater No caving Backfilled	

Graphic Log

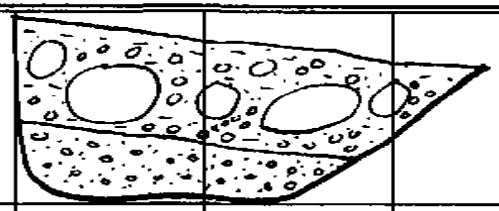


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP88

LOG OF EXCAVATION Trench No. TP89	Logged By: NM	Date Excavated: 6/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Alluvium: Medium brown silty fine to coarse grained SAND with subangular to rounded gravels, cobbles and boulders (approx. 30% greater than 1' diameter), clasts up to 2' diameter, typically a few inches to 1' diameter, well graded, moist, medium dense.	
2.5 - 4	Mint Canyon Formation: Light greenish gray conglomeratic SANDSTONE, clasts predominantly gravel to cobble size, moist, dense.	
	Total Depth - 4' No groundwater No caving Backfilled	

Graphic Log

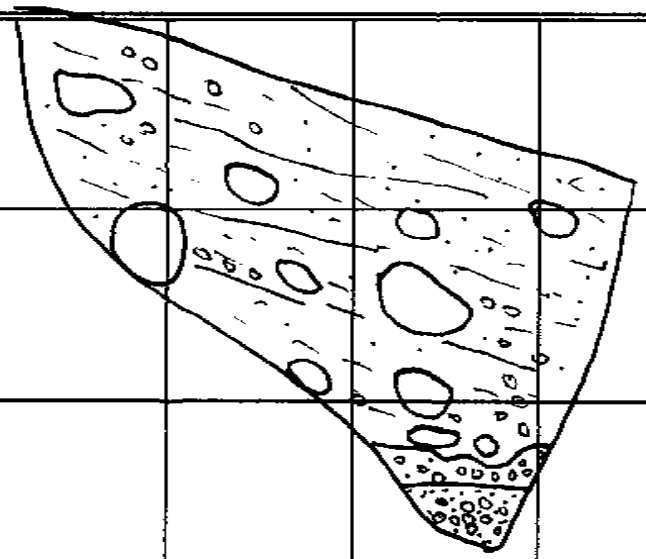


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP89

LOG OF EXCAVATION Trench No. TP90	Logged By: NM	Date Excavated: 6/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 8	Alluvium: Medium brown clayey silty fine to coarse grained gravelly SAND with dispersed cobbles and boulders (approx. 10% greater than 1' diameter), clasts up to 2' diameter but typically a few inches to 12" diameter, occasional crude bedding, increasing moisture with depth, medium dense.	
8 - 9	Gradational irregular contact to medium brown gravelly SAND, well graded with occasional cobbles to boulders up to 14" diameter (approximately 5% greater than 1' diameter), very moist, dense.	
9 - 10.5	Mint Canyon Formation: Light green gray sandy CONGLOMERATE, moist, very dense.	
	Total Depth - 10.5' No groundwater No caving Backfilled	

Graphic Log

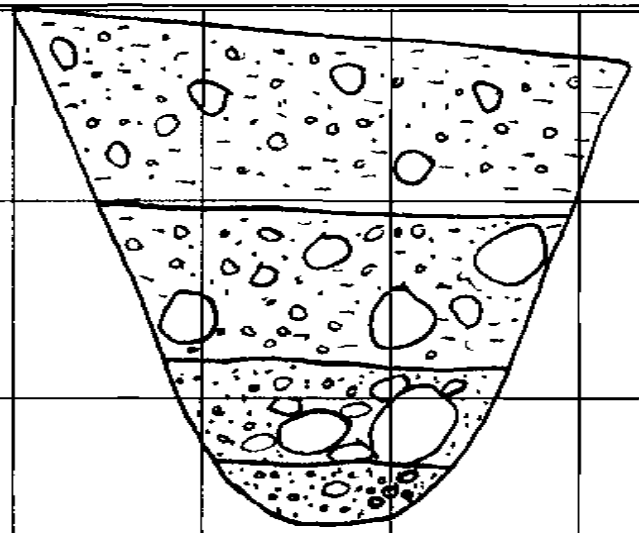


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP90

LOG OF EXCAVATION Trench No. TP92	Logged By: NM	Date Excavated: 6/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4.5	Colluvium: Medium brown silty sandy CLAY to clayey SAND with gravels and lesser cobbles, porous, abundant rootlets, moist, medium dense.	
4.5 - 8.5	Alluvium: Medium brown silty fine to coarse grained gravelly SAND to sandy GRAVEL with abundant gravels and cobbles and lesser boulders (approximately 10% greater than 1'), boulders as coarse as approximately 2' diameter, well graded, moist, medium dense.	
8.5 - 11	Medium to light brown fine to coarse grained gravelly SAND with cobbles and boulders (approximately 15% greater than 1' diameter), well graded, low % of fines, moist to very moist, dense, boulders up to 2.5' diameter.	
11 - 12.5	Mint Canyon Formation: Light greenish gray sandy gravel CONGLOMERATE, moist, very dense.	
	Total Depth - 12.5' No groundwater No caving Backfilled	

Graphic Log

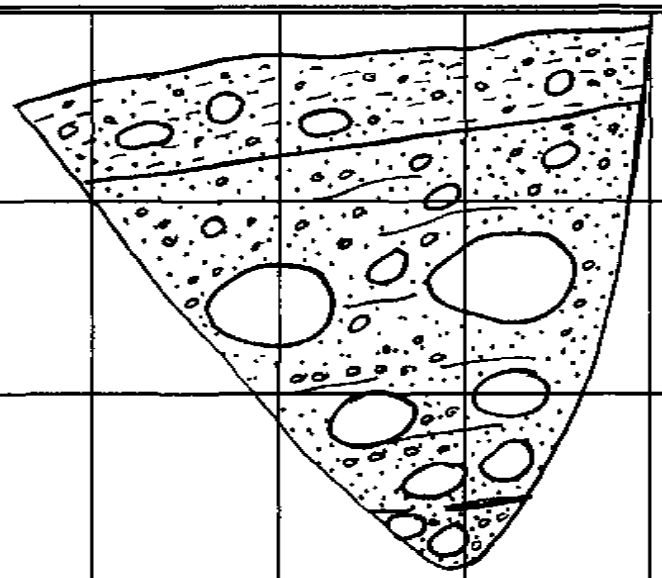


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP92

LOG OF EXCAVATION Trench No. TP93	Logged By: NM	Date Excavated: 6/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Colluvium: Medium brown clayey silty SAND with gravels and lesser cobbles and boulders (less than 15% is boulders), pinhole porosity, medium dense, moist.	
2.5 - 12	Alluvium: Light grayish brown fine to coarse grained gravelly SAND with abundant cobbles and occasional boulders (approx. 5% greater than 1' diameter), angular to rounded clasts (mostly subrounded), with very faint imbrication dipping gently (1°-3°) downslope, massive, slightly friable, rootlets, moist, medium dense to dense with depth.	
12 - 13.5	Faint contact to light brown fine to coarse grained gravelly SAND with cobbles and boulders (30% greater than 1' diameter), subangular to rounded clasts typically 6" to 14" up to 2.5' diameter, some boulders supported by fine to medium sand matrix, friable, slight caving, moist, dense, 14' maximum depth for backhoe, boulder on bottom won't break free enough to reach 13.5'	
	Total Depth - 13.5' No groundwater No caving Backfilled	

Graphic Log

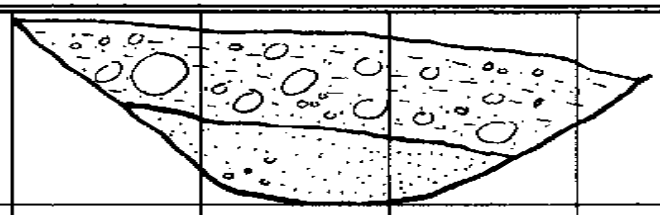


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP93

LOG OF EXCAVATION Trench No. TP94	Logged By: NM	Date Excavated: 6/5/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Alluvium: Medium brown clayey silty SAND with dispersed gravels and cobbles, occasional boulders up to approx. 1.5' diameter (approx. 35% greater than 1' diameter), well graded, porous, rootlets, moist, medium dense.	
2.5 - 4	Mint Canyon Formation?: Light brown fine to medium grained SANDSTONE with occasional gravels and cobbles, moderately graded, moist, very dense,oxidation stains.	
	Total Depth - 4' No groundwater No caving Backfilled	

Graphic Log

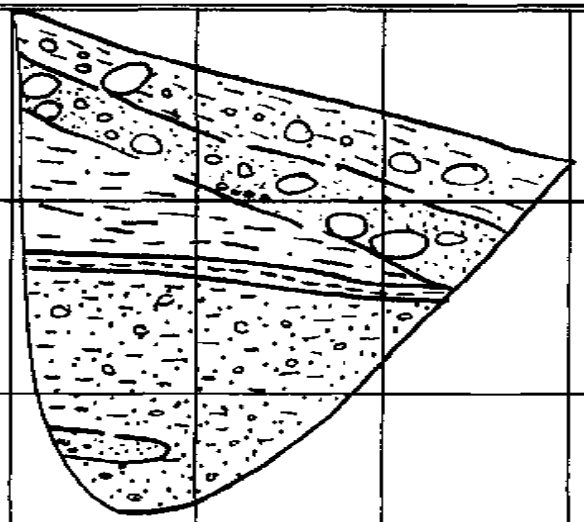


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP94

LOG OF EXCAVATION Trench No. TP95	Logged By: NM	Date Excavated: 6/5/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Alluvium: Medium brown silty SAND with gravels and cobbles, less than 25% is coarse grained, rootlets, moist, medium dense.	
1.5 - 3	Light grayish brown sandy GRAVEL to gravelly SAND with cobbles and lesser boulders (approximately 15% greater than 1' diameter) well graded, subrounded to rounded clasts typically a few inches to 10" diameter, moist, medium dense.	
3 - 5'3"	Landslide Debris: Red brown silty CLAY to CLAY with occasional coarse sand grains, very moist, medium stiff.	
5'3" - 5.5'	Slide Plane?: Medium brown CLAY (high plasticity), abundant randomly oriented, polished shear surfaces, very moist, medium stiff	
5.5 - 12	Mint Canyon Formation?: Mottled gray brown, orange brown and brown sandy CLAYSTONE to clayey SANDSTONE with abundant coarse sand grains and lesser gravels and cobbles, well graded, massive, very moist, very dense, occasional discontinuous pockets of orange brown fine to coarse grained SAND with occasional gravels and cobbles.	
	Total Depth - 12' No groundwater No caving Backfilled	

Graphic Log

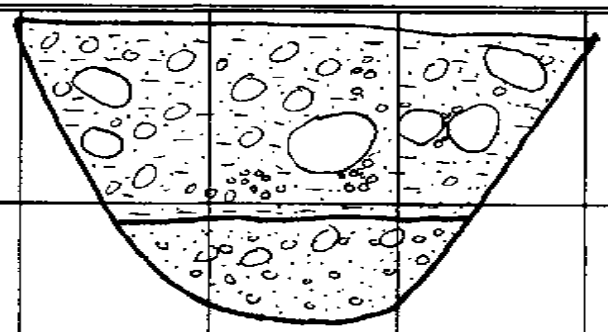


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP95

LOG OF EXCAVATION Trench No. TP96	Logged By: NM	Date Excavated: 6/5/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 5	Alluvium: Medium brown silty fine to coarse grained SAND with gravels, cobbles and boulders (approx. 10% greater than 1' diameter), subangular to rounded clasts typically a few inches to 1' diameter (predominantly cobbles and gravels), well graded, moist, medium dense.	
5 - 7.5	Mint Canyon Formation?: Light greenish gray gravel cobble CONGLOMERATE, moist, very dense, sandstone matrix supported.	
	Total Depth - 7.5' No groundwater No caving Backfilled	

Graphic Log

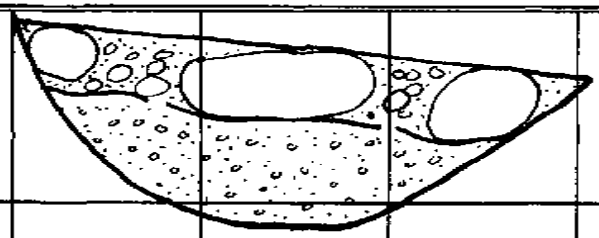


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP96

LOG OF EXCAVATION Trench No. TP97	Logged By: NM	Date Excavated: 6/5/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Alluvium; Medium brown silty fine to coarse grained gravelly SAND with abundant cobbles and boulders (approx. 70% greater than 1' diameter), clasts are subangular to rounded and typically 6" to 2.5' diameter with a few boulders up to 3 or 4' diameter (one clast 4' by 2.5'), well graded, moist, medium dense.	
2 - 4.5	Mint Canyon Formation?: Light greenish gray medium to coarse grained gravel CONGLOMERATE (sandstone matrix supported), moist, very dense, massive.	
	Total Depth - 4.5' No groundwater No caving Backfilled	

Graphic Log

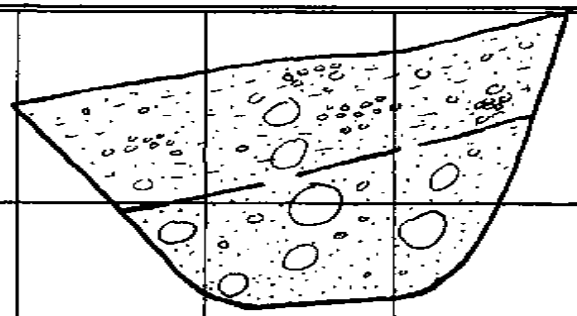


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP97

LOG OF EXCAVATION Trench No. TP98	Logged By: NM	Date Excavated: 6/5/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown clayey silty fine to coarse grained SAND with dispersed gravels and lesser cobbles (approx. 15%), well graded, moist, medium dense.	
3 - 6	Saugus Formation?: Light brown to tan fine to coarse grained SANDSTONE with gravels and lesser cobbles (occasional severely weathered granitic clast approx. 1' diameter), moderately graded, moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

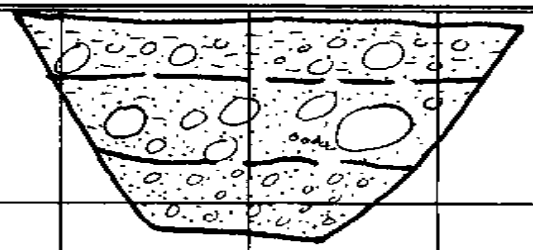


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP98

LOG OF EXCAVATION Trench No. TP99	Logged By: NM	Date Excavated: 6/5/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 -1.5	Alluvium: Medium brown silty SAND to sandy SILT with gravels, cobbles and sparse boulders (approx. 5% greater than 1' diameter) up to 1.5' diameter, moist, medium dense to medium stiff.	
1.5 - 3.5	Medium brown medium to coarse grained gravelly SAND with cobbles and occasional boulders (approx. 5% greater than 1' diameter), slightly friable, well graded, medium dense.	
3.5 - 5.5	Mint Canyon Formation?: Light greenish gray gravel cobble CONGLOMERATE, moist, very dense.	
	Total Depth - 5.5' No groundwater No caving Backfilled	

Graphic Log

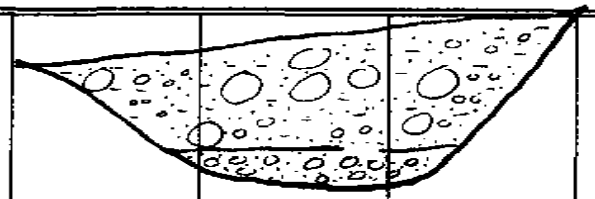


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP99

LOG OF EXCAVATION Trench No. TP100	Logged By: NM	Date Excavated: 6/6/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown silty SAND to sandy SILT with gravels, cobble, and lesser boulders (approx. 10% is boulder and 5% is greater than 1' diameter), clasts are subangular to rounded and typically a few inches to 1' diameter, well graded, moist, medium dense to medium stiff.	
3 - 4	Saugus Formation: Light orangish brown medium to coarse grained sandy CONGLOMERATE, slightly moist, very dense, difficult to excavate.	
	Total Depth - 4' No groundwater No caving Backfilled	

Graphic Log

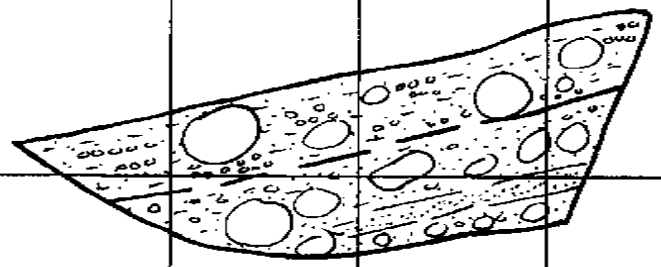


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP100

LOG OF EXCAVATION Trench No. TP101	Logged By: NM	Date Excavated: 6/6/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Alluvium: Medium brown silty clayey medium to coarse grained SAND with gravels, cobbles and lesser boulders (approx. 5% greater than 1' diameter), clasts are typically a few inches to 10" diameter up to 1.5', moist, medium dense, porous.	
2 - 5	Saugus Formation: Light brown sandy CONGLOMERATE with 1' thick poorly graded discontinuous fine grained SANDSTONE interbed. Conglomerate is fine to medium grained sandstone matrix supported, moist, very dense, clasts are granitic and sedimentary (sandy claystone ripups or highly weathered volcanics).	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

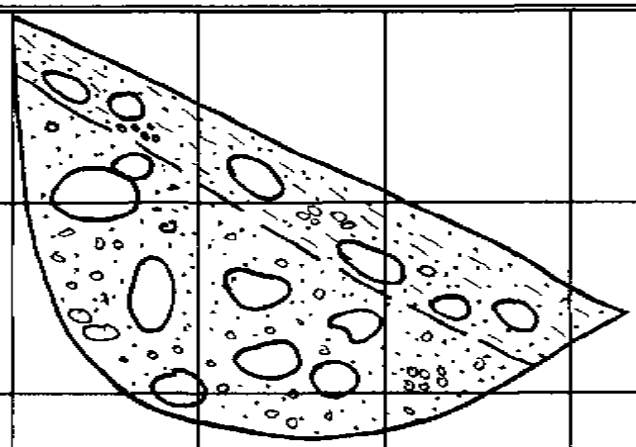


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP101

LOG OF EXCAVATION Trench No. TP102	Logged By: NM	Date Excavated: 6/6/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Landslide Deposit: Medium brown sandy CLAY with gravels, cobbles and occasional boulders up to 14" diameter, well graded, moist, medium stiff.	
2 - 8.5	Saugus Formation?: Light brown to light grayish brown gravel cobble CONGLOMERATE (medium grained sandstone matrix approximately 15% to 20%), granitic and lesser sedimentary clasts (bluish gray coarse grained sandy claystone), slightly moist, very dense, upper 1' is weathered/oxidized, approximately 5% are boulders up to 16" diameter.	
	Total Depth - 8.5' No groundwater No caving Backfilled	

Graphic Log

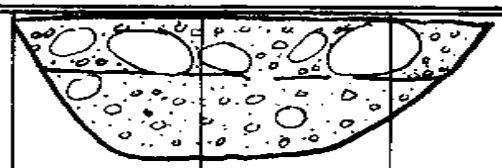


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP102

LOG OF EXCAVATION Trench No. TP103	Logged By: NM	Date Excavated: 6/6/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Alluvium: Light to medium brown fine to coarse grained SAND with gravels, cobbles and boulders (approximately 20% greater than 1' diameter up to 2'), approximately 30% is fine grained, loose, dry.	
1.5 - 3	Saugus Formation?: Light brown gravel cobble CONGLOMERATE, moist, very dense, difficult to excavate at 3'.	
	Total Depth - 3' No groundwater No caving Backfilled	

Graphic Log

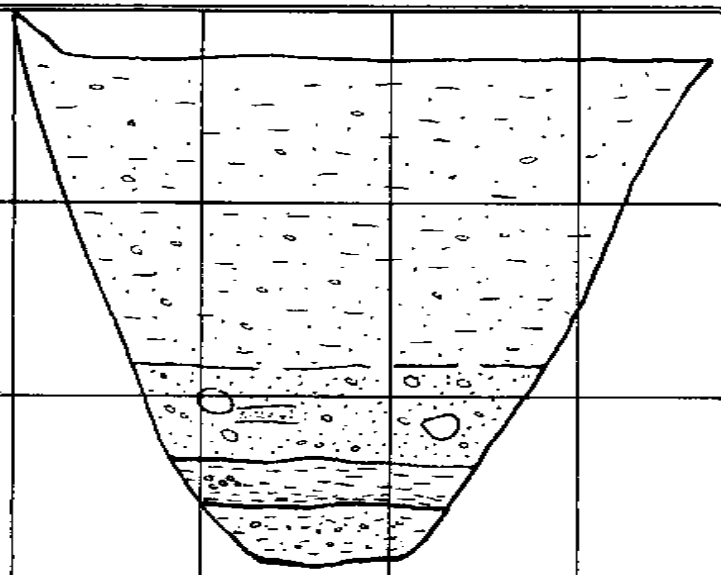


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP103

LOG OF EXCAVATION Trench No. TP104	Logged By: NM	Date Excavated: 6/6/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 8	Landslide Debris: Medium brown sandy CLAY to clayey SAND with scattered coarse sand and gravels, moist to very moist at 8', massive, medium dense to medium stiff.	
8 - 10.5	Irregular contact to light yellow brown fine to coarse grained SANDSTONE with gravels and cobbles, well graded, very moist to wet at base, 1' thick discontinuous orange brown interbed of silty SAND at 9-10', medium dense.	
10.5 - 11'8"	Slide Plane?: Medium brown CLAYSTONE (high plasticity) with abundant polished shears and mullion surfaces (discontinuous 6" thick interbed of fine grained silty sandstone at 11'), several gravels in claystone at base.	
11'8" - 13	Saugus Formation?: Medium brown sandy CLAYSTONE with coarse sand grains and lesser small gravels, massive, no shearing, increasingly more coarse sand with depth, moist very stiff to hard, small seepage in back corner of pit.	
	Total Depth - 13' Seep at 13' No caving Backfilled	

Graphic Log

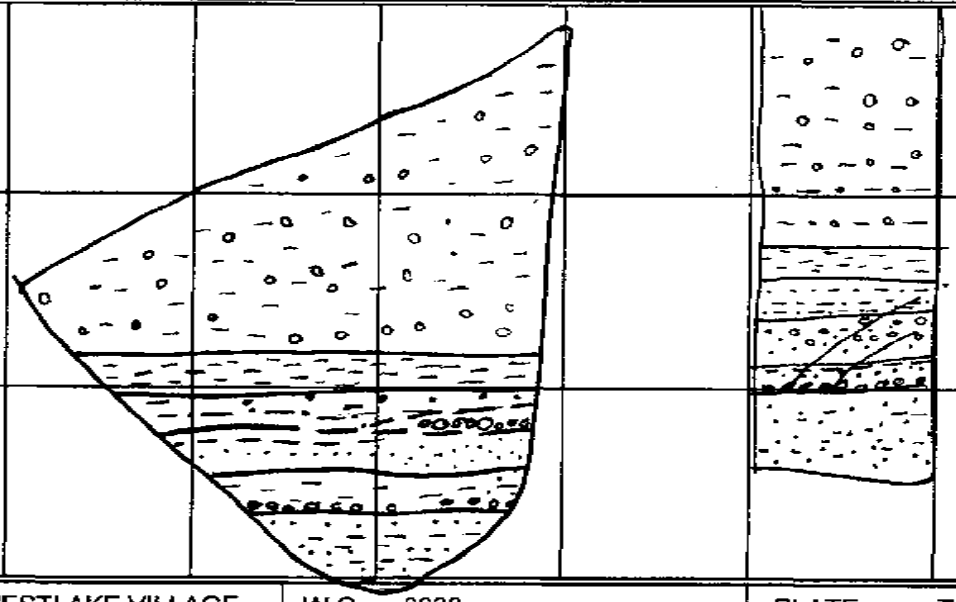


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP104

LOG OF EXCAVATION Trench No. TP105	Logged By: NM	Date Excavated: 6/6/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 6	Landslide Debris: Medium orangish brown silty clayey fine to medium grained SAND with coarse sand and small gravels, occasional cobbles, well graded, massive, pinhole porosity, rootlets, slightly moist, medium dense.	
6 - 7	Irregular contact to medium brown CLAYSTONE with abundant polished shears/calcium carbonate specks, manganese stains, occasional small gravels and coarse sand grains, moist, medium stiff to stiff.	
7 - 7.5	Light brown clayey SILTSTONE to SILTSTONE, massive, moist, very stiff.	
7.5 - 8	Discontinuous light grayish brown fine to coarse SANDSTONE with gravels, moderately to well graded, slightly moist, very dense.	
8 - 8'3"	Light brown SILTSTONE, massive, moist, very stiff.	
@8'3"	2-3 mm thick claystone shear, over light brown silty very fine SANDSTONE, poorly graded, moist, massive, very dense.	
@8'9"	1/4" thick CLAYSTONE shear, irregular sharp contact.	
8'9.25" - 10	Medium brown sandy CLAYSTONE with dispersed coarse sand grains and very sparse small gravels, massive, moist, very stiff.	
10 - 12	Grades to light medium brown silty very fine grained SANDSTONE, massive, moist, very dense. Total Depth - 12', No groundwater, No caving, Backfilled	

Graphic Log

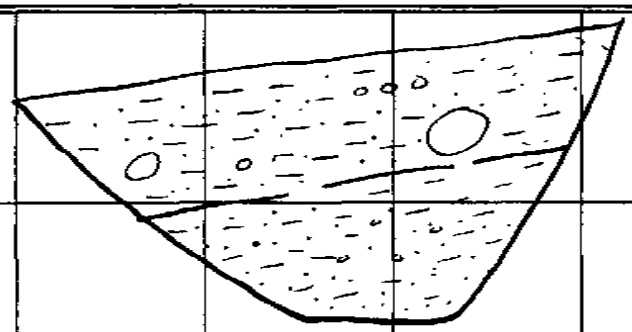


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP105

LOG OF EXCAVATION Trench No. TP106	Logged By: NM	Date Excavated: 6/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown silty clayey fine to coarse grained SAND to sandy CLAY with occasional gravels and very sparse cobbles and boulders up to 1' diameter, porous, rootlets, moist, medium stiff.	
3 - 7	Saugus Formation?: Reddish brown sandy MUDSTONE with coarse sand grains, moderately graded, massive, moist, seepage observed in small tight fractures at approximately 6'.	
	Total Depth - 7' Seep at 6' No caving Backfilled	

Graphic Log

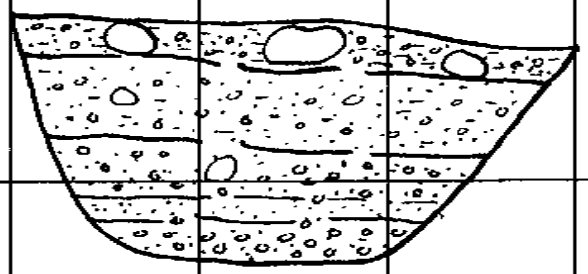


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP106

LOG OF EXCAVATION Trench No. TP107	Logged By: NM	Date Excavated: 6/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Alluvium: Dark brown sandy silty CLAY with occasional gravels and boulders (2-3 approx. 1' diameter), porous, moist, medium stiff.	
1 - 3	Severely Weathered Saugus Formation: Medium brown gravel cobble CONGLOMERATE, clayey sand matrix supported, moist, medium dense to dense.	
3 - 6	Saugus Formation: Light brown gravel cobble CONGLOMERATE with a 1' thick interbed of fine grained SANDSTONE from 4-5'. Contacts are gradational, moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

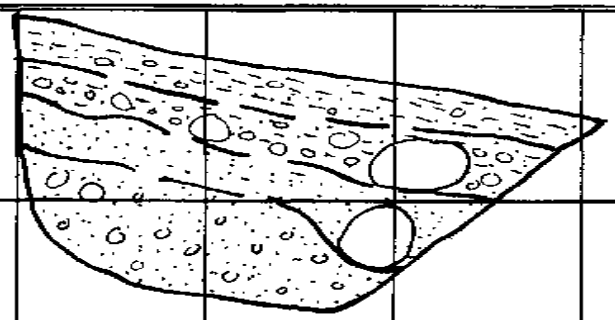


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP107

LOG OF EXCAVATION Trench No. TP108	Logged By: NM	Date Excavated: 6/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark brown sandy CLAY with dispersed gravels, cobbles, and occasional boulders, porous, slightly moist, medium stiff.	
1 - 2	Alluvium: Medium brown sandy CLAY with gravels, cobbles and occasional boulders (1 clast near surface is approx. 2' maximum diameter), typically 1-1.5' diameter, well graded, moist, rootlets, medium dense (approximately 3% greater than 1' diameter).	
2 - 3	Saugus Formation?: Light brown to light reddish brown very fine to silty very fine grained SANDSTONE, wavy irregular contact above and below, upper few inches is weathered, poorly graded, moist, very dense.	
3 - 6	Light yellowish brown sandy CONGLOMERATE with several clasts up to approx. 1' diameter, fine to medium grained sandstone supported matrix, moist.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

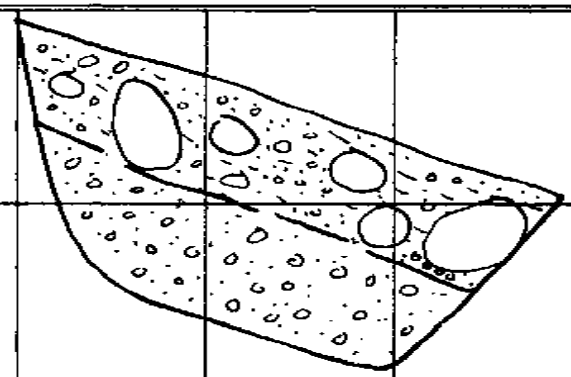


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP108

LOG OF EXCAVATION Trench No. TP109	Logged By: NM	Date Excavated: 6/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown sandy CLAY to clayey SAND with abundant gravels, cobbles and boulders (approximately 20% greater than 1' diameter), several boulders up to approx. 2' diameter, slightly moist, medium dense.	
3 - 6	Saugus Formation?: Light brown sandy gravel cobble CONGLOMERATE, sandstone matrix supported, slightly moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

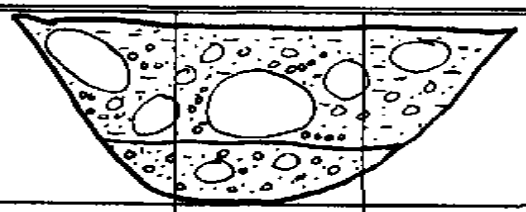


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP109

LOG OF EXCAVATION Trench No. TP110	Logged By: NM	Date Excavated: 6/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown silty fine to coarse grained gravelly SAND with abundant cobbles and boulders (approximately 25% greater than 1' diameter), well graded, subangular to subrounded clasts typically 4-6" to approximately 1.5', moist, medium dense.	
3 - 4.5	Saugus Formation?: Light brown sandy gravel cobble CONGLOMERATE, fine to medium grained sandstone matrix supported, moist, very dense.	
	Total Depth - 4.5' No groundwater No caving Backfilled	

Graphic Log

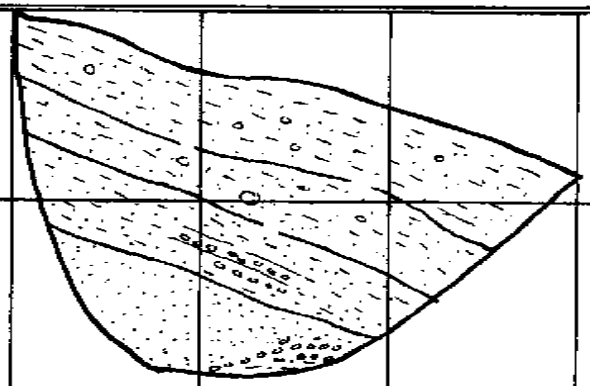


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP110

LOG OF EXCAVATION Trench No. TP111	Logged By: NM	Date Excavated: 6/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Colluvium: Dark brown sandy CLAY with occasional gravels, rootlets, porous, slightly moist, medium stiff.	
2 - 3	Gradational contact to reddish brown clayey SAND with occasional gravels and cobbles, massive, pinhole porosity, slightly moist, medium dense.	
3 - 5	Saugus Formation: Light reddish brown very fine grained silty SANDSTONE with occasional discontinuous coarse grained interbeds approximately 6" thick, poorly graded, moist, very dense.	
5 - 7.5	Gradational contact with light reddish brown fine grained SANDSTONE, poorly graded, massive, moist, very dense, scoured contact with discontinuous siltstone.	
	Total Depth - 7.5' No groundwater No caving Backfilled	

Graphic Log

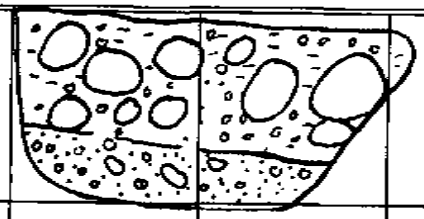


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP111

LOG OF EXCAVATION Trench No. TP112	Logged By: NM	Date Excavated: 6/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown clayey fine to coarse grained gravelly SAND with abundant cobbles and boulders (approximately 35% greater than 1' diameter), clasts typically 6" to 18" diameter (as coarse as 2.5" diameter), well graded, moist, medium dense.	
3 - 5	Saugus Formation?: Light brown gravel cobble CONGLOMERATE with medium grained sandstone supported matrix, moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

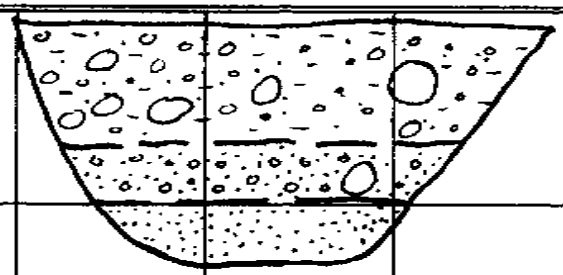


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP112

LOG OF EXCAVATION Trench No. TP113	Logged By: NM	Date Excavated: 6/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown sandy CLAY to clayey SAND with abundant gravels, cobbles and lesser boulders (approx. 10%) up to 1' diameter, well graded, rootlets, moist, medium dense.	
3 - 4.5	Saugus Formation: Light brown sandy CONGLOMERATE (matrix supported), occasional boulders approximately 1' diameter, moist, very dense.	
4.5 - 6	Irregular contact to light brown fine to very fine grained SANDSTONE, poorly graded, moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

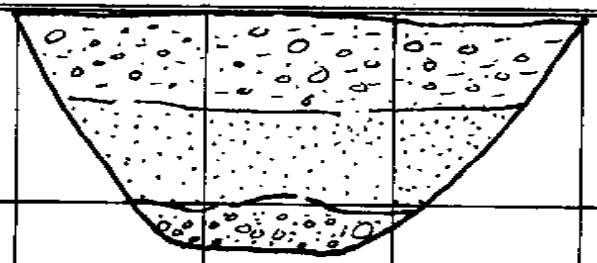


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP113

LOG OF EXCAVATION Trench No. TP114	Logged By: NM	Date Excavated: 6/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Alluvium: Medium brown silty fine to coarse grained SAND with gravels and cobbles, slightly friable, rootlets, well graded, slightly moist, very dense.	
2.5 - 5	Mint Canyon Formation?: Mottled light greenish gray and reddish brown fine grained SANDSTONE with occasional coarse sand grains, poorly graded, massive, moist, very dense.	
5 - 6	Light greenish gray sandy CONGLOMERATE, irregular undulating contact, sandstone matrix supported, massive, moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

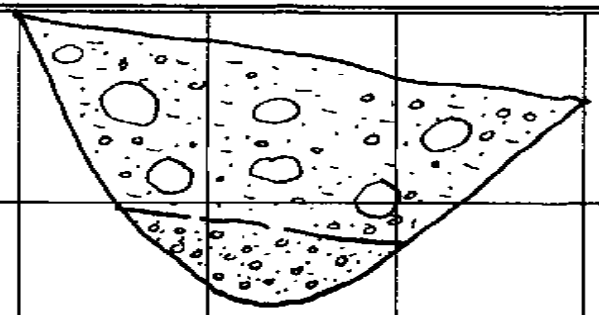


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP114

LOG OF EXCAVATION Trench No. TP115	Logged By: NM	Date Excavated: 6/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4.5	Alluvium: Medium brown clayey silty SAND with gravel, cobbles and boulders (approximately 10% greater than 1' diameter), subrounded clasts typically a few inches to approximately 1' diameter, moist, medium dense.	
4.5 - 6.5	Mint Canyon Formation?: Light greenish gray sandy gravel cobble CONGLOMERATE, moist, very dense (sandstone matrix supported).	
	Total Depth - 6.5' No groundwater No caving Backfilled	

Graphic Log

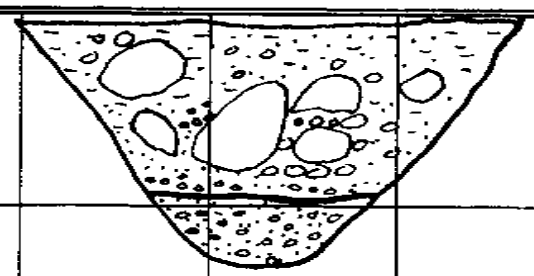


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP115

LOG OF EXCAVATION Trench No. TP116	Logged By: NM	Date Excavated: 6/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4.5	Alluvium: Medium brown silty fine to coarse grained gravelly SAND with cobbles and lesser boulders (approximately 15%), several clasts up to approximately 2' diameter (fractures when hit with bucket) but typically 1-3" diameter, well graded, slightly friable in bottom 1' (less fines), moist, medium dense.	
4.5 - 6	Mint Canyon Formation?: Light gray gravel cobble CONGLOMERATE, moist, very dense, massive.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

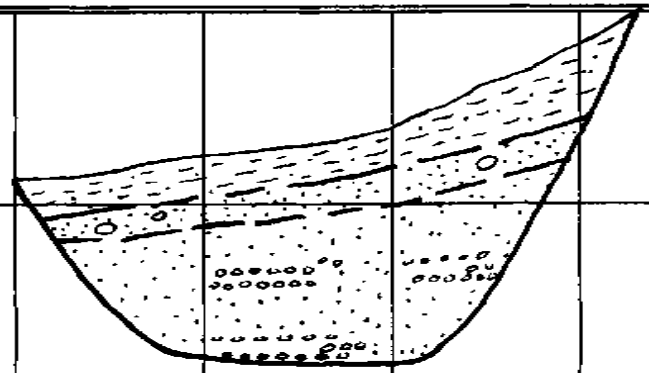


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP116

LOG OF EXCAVATION Trench No. TP117	Logged By: NM	Date Excavated: 6/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Alluvium: Dark brown sandy CLAY, porous, rootlets, moist.	
1 - 2	Severely Weathered Saugus Formation: Gradational contact to medium brown and reddish brown clayey SANDSTONE with occasional cobbles, porous, moist, medium dense.	
2 - 6	Saugus Formation: Mottled reddish brown and light gray fine grained SANDSTONE with crude discontinuous conglomeratic sandstone interbeds approx. 1' thick, moist to very moist at depth, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

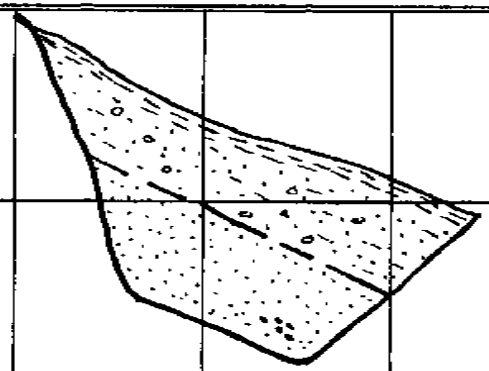


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP117

LOG OF EXCAVATION Trench No. TP118	Logged By: NM	Date Excavated: 6/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark brown sandy CLAY with occasional gravels, porous, moist, rootlets, medium stiff.	
1 - 2.5	Colluvium: Medium brown clayey SAND with occasional gravels and cobbles, porous, moist, medium dense.	
2.5 - 5.5	Saugus Formation: Light reddish brown fine grained SANDSTONE with occasional scattered gravels and cobbles, poorly graded, massive, moist, very dense.	
	Total Depth - 5.5' No groundwater No caving Backfilled	

Graphic Log

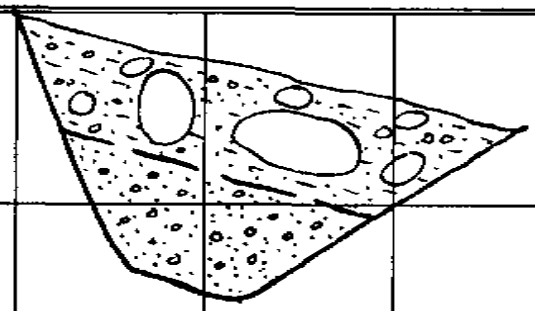


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP118

LOG OF EXCAVATION Trench No. TP119	Logged By: NM	Date Excavated: 6/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown clayey silty fine to coarse grained SAND with gravels, cobbles and boulders (approximately 15% greater than 1' diameter), angular to rounded clasts typically a few inches to 8" diameter with 4 or 5 clasts up to approximately 1.5-2' diameter, moist, medium dense.	
3 - 6	Saugus Formation: Light brown and light greenish gray sandy CONGLOMERATE (1-2 clasts are approximately 1' diameter and highly fractured), moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

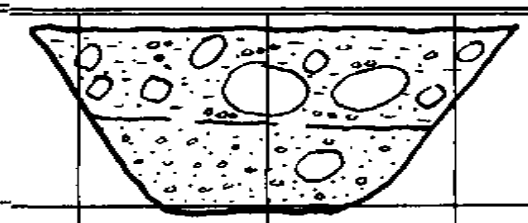


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP119

LOG OF EXCAVATION Trench No. TP120	Logged By: NM	Date Excavated: 6/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Alluvium: Medium brown clayey silty SAND with abundant gravels, cobbles and lesser boulders (approx. 10-15% greater than 1' diameter) up to 2' diameter, well graded, moist, medium dense.	
2.5 - 4.5	Saugus Formation: Light brown sandy CONGLOMERATE with occasional boulders approximately 1' diameter, moist, very dense.	
	Total Depth - 4.5' No groundwater No caving Backfilled	

Graphic Log

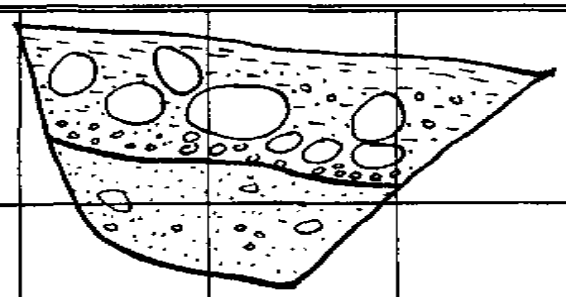


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP120

LOG OF EXCAVATION Trench No. TP121	Logged By: NM	Date Excavated: 6/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown silty clayey SAND with abundant gravels, cobbles and boulders (approximately 25% greater than 1' diameter), well graded, moist, medium dense, coarse sand at approximately 2-3'.	
3 - 6	Saugus Formation: Light yellow brown medium to coarse grained SANDSTONE with scattered gravels and lesser cobbles, moderately graded, very moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

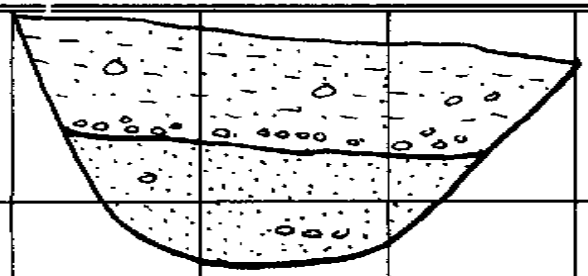


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP121

LOG OF EXCAVATION Trench No. TP122	Logged By: NM	Date Excavated: 6/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Colluvium: Dark brown sandy CLAY with scattered gravels and cobbles (approximately 5% are gravel to cobble clasts), rootlets, porous, moist, medium stiff.	
3 - 6	Saugus Formation: Sharp contact with light brown fine grained SANDSTONE with occasional scattered gravels and lesser cobbles, massive, poorly graded, moist, very dense, color change to light reddish brown at 5.5'.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

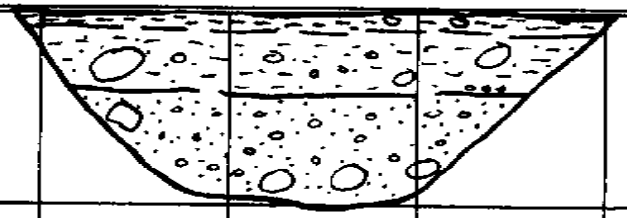


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP122

LOG OF EXCAVATION Trench No. TP123	Logged By: NM	Date Excavated: 6/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil; Dark brown sandy CLAY with scattered gravels, moist, rootlets, medium stiff.	
1 - 2.5	Colluvium: Medium brown sandy CLAY to clayey SAND with gravels and occasional cobbles to boulders up to approximately 14" diameter, moist, medium stiff to medium dense.	
2.5 - 5	Saugus Formation: Light brown and light reddish brown sandy CONGLOMERATE, fine to coarse grained sandstone supported matrix, moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

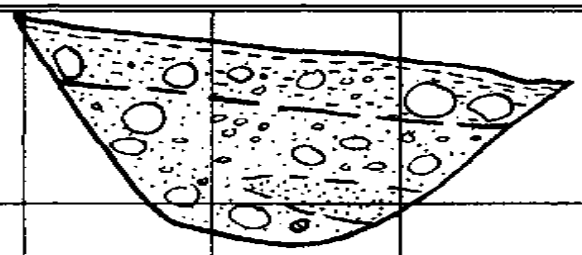


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP123

LOG OF EXCAVATION Trench No. TP124	Logged By: NM	Date Excavated: 6/9/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 0.5	Topsoil: Dark brown sandy CLAY with gravels and cobbles, rootlets, porous, moist, medium stiff.	
0.5 - 1.5	Alluvium: Medium brown sandy CLAY with abundant gravels, cobbles and lesser boulders (approximately 5%), angular to rounded granitic clasts up to approx. 1' diameter, well graded, moist, medium dense.	
1.5 - 5	Saugus Formation: Gradational contact to mottled light reddish brown and light greenish gray gravel cobble CONGLOMERATE with a discontinuous 1' thick interbed of light gray silty fine grained SANDSTONE at 3-4', moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

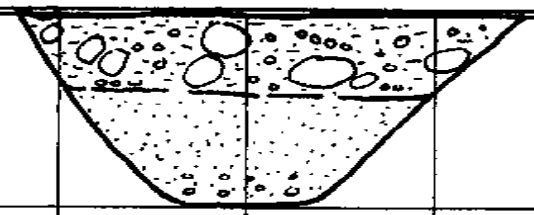


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP124

LOG OF EXCAVATION Trench No. TP125	Logged By: NM	Date Excavated: 6/9/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Alluvium: Medium brown to medium orangish brown clayey SAND with abundant gravels, cobbles and lesser boulders (approximately 10%), angular to subrounded clasts up to 18" diameter (approximately 10% greater than 12" diameter), abundant rootlets, moist, medium dense, clear contact with unit below.	
2 - 4	Saugus Formation: Yellow brown fine grained SANDSTONE, poorly graded, moist, massive, very dense.	
4 - 5	Grading to fine grained SANDSTONE with gravels (approximately 35%), moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

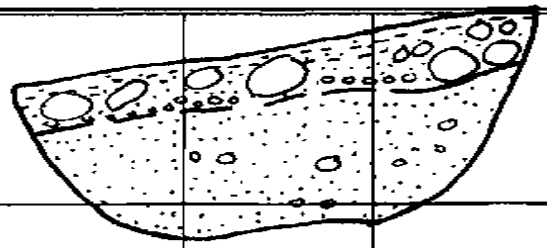


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP125

LOG OF EXCAVATION Trench No. TP126	Logged By: NM	Date Excavated: 6/9/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Alluvium: Medium brown to reddish brown(with depth)sandy CLAY to clayey SAND with abundant gravels, cobbles, and lesser boulders (approximately 15% greater than 1' diameter), 1 or 2 boulders up to 1.5' diameter, porous, moist, medium dense.	
2 - 5	Saugus Formation: Yellow brown fine and fine to coarse grained SANDSTONE with scattered gravels and cobbles, massive, moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

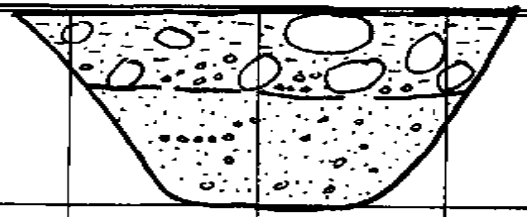


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP126

LOG OF EXCAVATION Trench No. TP127	Logged By: NM	Date Excavated: 6/9/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Alluvium: Medium brown silty clayey SAND with abundant gravels, cobbles, and lesser boulders up to approximately 1' diameter, well graded, moist, medium dense.	
2 - 5	Saugus Formation: Sharp contact to yellowish brown fine to coarse grained conglomeratic SANDSTONE (approximately 50% is sandstone), moist, very dense, massive.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

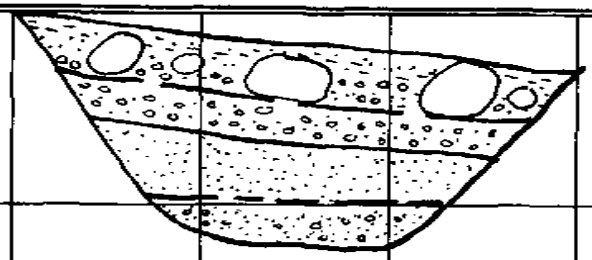


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP127

LOG OF EXCAVATION Trench No. TP128	Logged By: NM	Date Excavated: 6/9/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Alluvium: Medium brown clayey SAND with abundant gravels, cobbles and boulders (2-3 boulders up to 2' diameter), becoming more sandy with depth, well graded, moist, medium dense.	
1.5 - 2.5	Saugus Formation: Orangish brown coarse grained CONGLOMERATE, moist, very dense, clasts commonly gravel and cobble, slightly undulating crude contact with unit below.	
2.5 - 4	Light yellow brown fine grained SANDSTONE, poorly graded, moist, massive, very dense, faint crude contact with unit below.	
4 - 5	Light yellow brown conglomeratic SANDSTONE (approximately 50% fines), moderately graded, moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

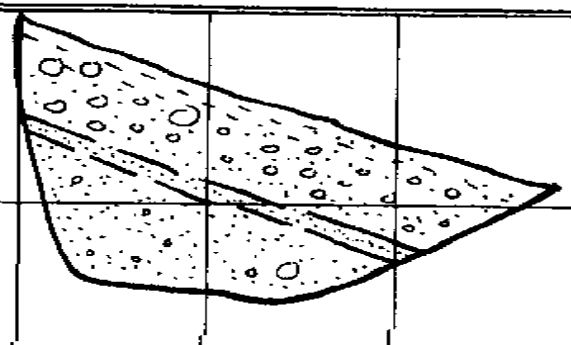


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP128

LOG OF EXCAVATION Trench No. TP129	Logged By: NM	Date Excavated: 6/9/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Colluvium: Medium brown sandy CLAY with abundant subrounded to rounded gravels and cobbles, slightly moist, rootlets, medium dense.	
2.5 - 3	Weathered Saugus Formation: Gradational contact to orangish brown medium to coarse grained SANDSTONE, moderately graded, slightly moist, dense.	
3 - 6	Saugus Formation: Light yellow brown medium to coarse grained SANDSTONE with scattered gravels (approximately 15%), moderately graded, massive, moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

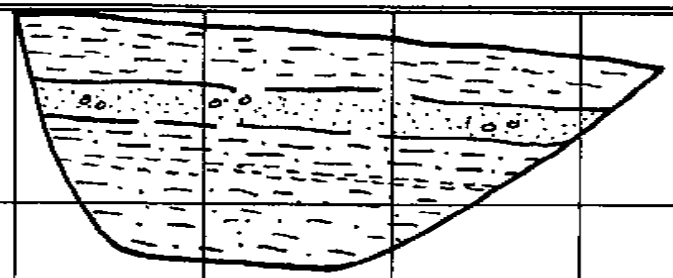


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP129

LOG OF EXCAVATION Trench No. TP130	Logged By: NM	Date Excavated: 6/9/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Topsoil/Dump Fill: Dark brown sandy clayey SILT with abundant pieces of small trash (bottles, tin, plastic), dry, loose.	
1.5 - 2.5	Weathered Saugus Formation: Light brown silty fine to coarse grained SANDSTONE with gravels, moderately graded, slightly friable, moist, medium dense.	
2.5 - 3'4"	Saugus Formation; Medium brown SILTSTONE to clayey SILTSTONE, massive, moist, hard.	
3'4" - 3'5"	Medium brown CLAYSTONE with pervasive internal shears, not highly polished, moist, very stiff.	
3'5" - 6	Light medium brown MUDSTONE with abundant white round specs (1-2mm), massive, moist, hard.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

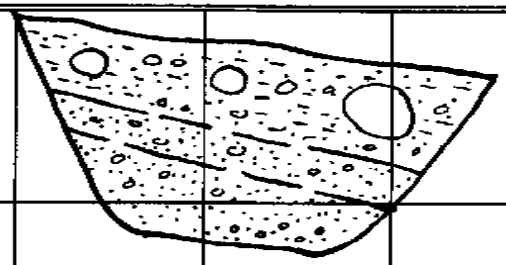


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP130

LOG OF EXCAVATION Trench No. TP131	Logged By: NM	Date Excavated: 6/9/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Dump Fill/Colluvium: Medium brown clayey silty SAND with gravels, cobbles, and occasional boulders up to approximately 1' diameter, abundant trash (glass, tin, metal pipe), porous, moist, medium dense.	
2 - 3	Severely Weathered Saugus Formation: Orange brown medium to coarse grained SANDSTONE with gravels and cobbles, moderately graded, slightly moist, dense.	
3 - 5	Saugus Formation: Light brown fine to coarse grained SANDSTONE with scattered gravels (approximately 25%), massive, moderately graded, moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

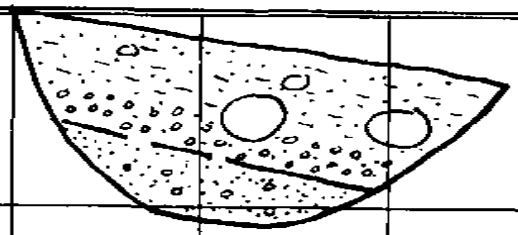


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP131

LOG OF EXCAVATION Trench No. TP132	Logged By: NM	Date Excavated: 6/9/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Dump Fil/Colluvium: Medium brown clayey silty SAND with gravels, cobbles and boulders (approximately 10%), with 2-3 clasts up to approximately 1.5' diameter, abundant transh (mostly metal cans/boxes) in upper 2.5', dry, loose.	
3 - 4.5	Saugus Formation: Light yellow brown medium to coarse grained SANDSTONE with scattered gravels (approximately 30%), moderately graded, massive, moist, very dense.	
	Total Depth - 4.5' No groundwater No caving Backfilled	

Graphic Log

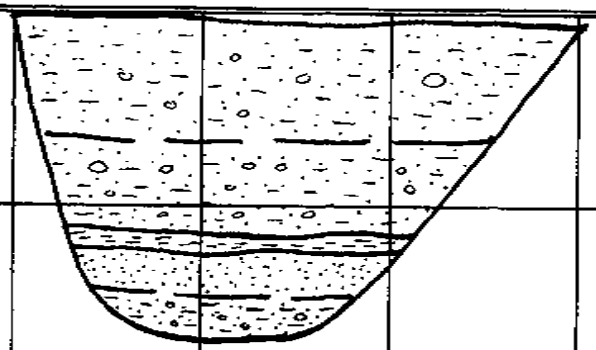


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP132

LOG OF EXCAVATION Trench No. TP133	Logged By: NM	Date Excavated: 6/9/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Topsoil: Medium brown clayey silty SAND with occasional gravels, slightly moist, porous, medium dense, occasional old metal pipe.	
3 - 5.5	Colluvium: Light medium brown silty fine to medium grained SAND and clayey SAND with occasional gravels, slightly moist, medium dense.	
5.5 - 6'3"	Saugus Formation: Medium brown clayey SILTSTONE to silty CLAYSTONE with occasional claystone fragments, massive, moist, very stiff.	
6'3" - 7'3"	Light grayish brown fine to medium grained SANDSTONE, moderately graded, slightly moist, very dense.	
7'3" - 8	Medium brown clayey fine grained SANDSTONE with coarse sand grains, slightly moist, very dense.	
	Total Depth - 8' No groundwater No caving Backfilled	

Graphic Log

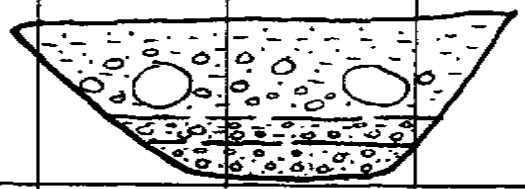


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP133

LOG OF EXCAVATION Trench No. TP134	Logged By: NM	Date Excavated: 6/12/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Alluvium: Medium brown sandy CLAY with gravels, cobbles and occasional boulders (approximately 2-3% greater than 1' diameter), subangular to rounded clasts typically a few inches to 8" diameter, well graded, dry to slightly moist with depth, medium dense, rootlets coarser grained with depth.	
2.5 - 3	Severely Weathered Saugus Formation: Gradational contact to orange brown CONGLOMERATE with sandy clay matrix, occasional rootlets, moist, dense.	
3 - 4	Saugus Formation: Mottled light reddish brown and light greenish gray CONGLOMERATE with fine to medium grained sandstone matrix (approximately 15%), moist, very dense.	
	Total Depth - 4' No groundwater No caving Backfilled	

Graphic Log

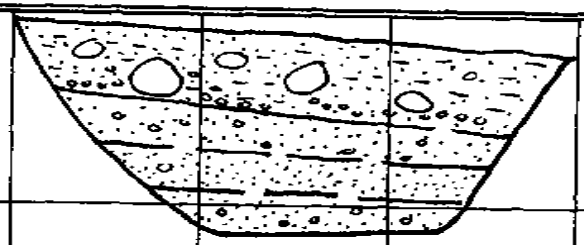


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP134

LOG OF EXCAVATION Trench No. TP135	Logged By: NM	Date Excavated: 6/12/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Alluvium: Medium brown sandy CLAY with subangular to subrounded gravels, cobbles, and occasional boulders up to approximately 1' diameter, clasts typically 3" diameter, well graded, dry to moist with depth, medium dense, rootlets, porous.	
2 - 3	Saugus Formation: Light orangish brown medium to coarse grained SANDSTONE with gravels (10-15%), moderately graded with crude faint flat lying contacts, moist, very dense.	
3 - 4	Light yellow brown medium to coarse grained SANDSTONE with very sparse gravels (less than 10%), moderately graded, moist, very dense.	
4 - 5	Crude faint contact to light yellow brown medium to coarse grained gravelly SANDSTONE, moderately graded, moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

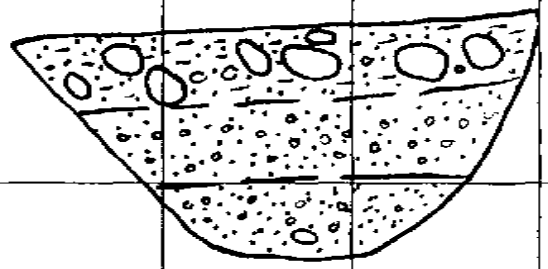


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP135

LOG OF EXCAVATION Trench No. TP136	Logged By: NM	Date Excavated: 6/12/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Alluvium: Medium brown sandy CLAY with gravels, cobbles, and boulders (approximately 15% greater than 1' diameter), subangular to subrounded clasts up to 2' diameter, rootlets, well graded, slightly moist, medium dense.	
2 - 4	Saugus Formation: Light yellow brown gravelly SANDSTONE with occasional oxidation stains, moderately graded, moist, very dense.	
4 - 6	Light yellow brown medium to coarse grained SANDSTONE with sparse gravels and cobbles, moderately graded, massive, moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

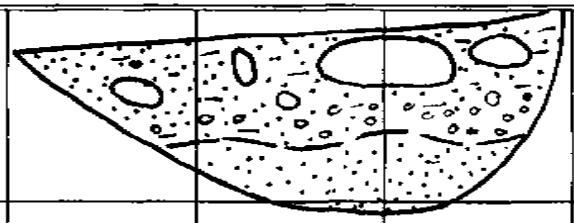


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP136

LOG OF EXCAVATION Trench No. TP137	Logged By: JN	Date Excavated: 6/12/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Alluvium: Medium brown sandy CLAY with subangular to subrounded gravels, cobbles and boulders, rootlets, well graded, slightly moist, medium dense (several large boulders approximately 3' diameter), gradational undulatory contact.	
2.5 - 4.5	Mint Canyon Formation: Light greenish gray fine grained SANDSTONE, slight orange brown oxidation, poorly graded, massive, very dense, moist.	
	Total Depth - 4.5' No groundwater No caving Backfilled	

Graphic Log

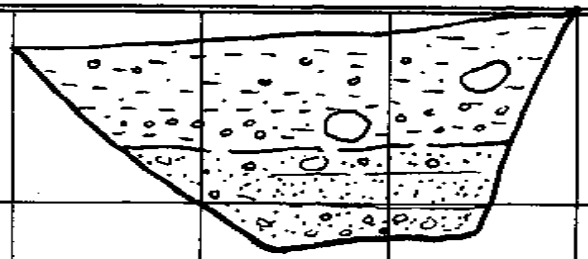


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP137

LOG OF EXCAVATION Trench No. TP138	Logged By: NM	Date Excavated: 6/12/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Colluvium: Dark brown sandy silty CLAY with scattered gravels and cobbles (occasional boulders up to approximately 1' diameter), well graded, porous, rootlets, dry to moist at depth, medium dense, trash in upper 1' (metal scraps).	
3 - 5.5	Saugus Formation: Mottled light greenish gray and light reddish brown gravel cobble CONGLOMERATE with a discontinuous 1' thick interbed of light reddish brown fine grained SANDSTONE (from 3.5-4.5'), moist, very dense.	
	Total Depth - 5.5' No groundwater No caving Backfilled	

Graphic Log

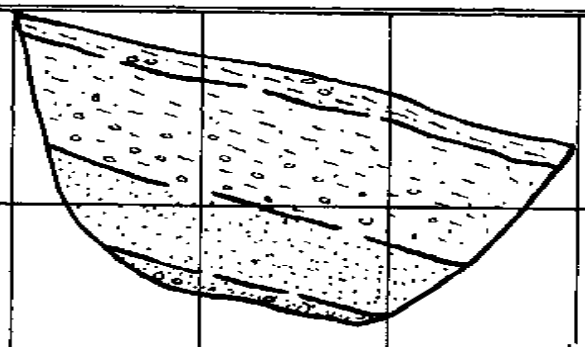


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP138

LOG OF EXCAVATION Trench No. TP139	Logged By: NM	Date Excavated: 6/12/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark brown clayey SILT with occasional gravels and cobbles, porous, rootlets, medium dense.	
1 - 4	Alluvium: Medium brown sandy CLAY with abundant fine gravels and lesser coarse gravels and cobbles, well graded, massive, moist, medium stiff.	
4 - 5.5	Saugus Formation: Medium orange brown to light reddish brown fine to medium grained SANDSTONE, moderately graded, massive, moist, very dense, small calcium carbonate specs.	
5.5 - 6	Gradational contact to light greenish gray fine grained SANDSTONE with angular to subrounded gravel and cobbles at 5.5', poorly to moderately graded, moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

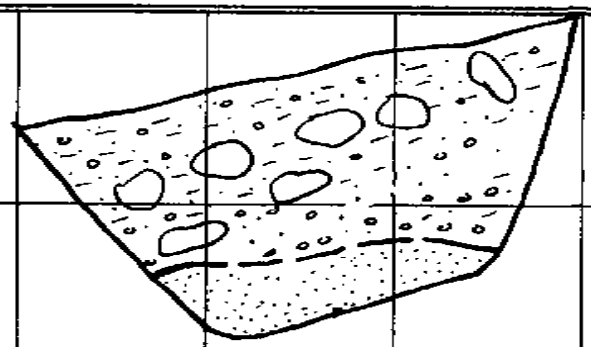


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP139

LOG OF EXCAVATION Trench No. TP140	Logged By: NM	Date Excavated: 6/12/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3.5	Alluvium: Medium brown sandy CLAY to clayey SAND with abundant subangular to rounded gravel, cobble, and boulders (approximately 25% greater than 1' diameter), abundant rootlets, pinhole porosity, grading to coarse grained SAND at 2.5', well graded.	
3.5 - 6	Saugus Formation: Tan to light brown fine to medium grained SANDSTONE, massive, moist, very dense, occasional gravels.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

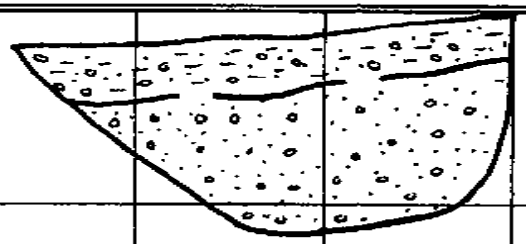


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP140

LOG OF EXCAVATION Trench No. TP141	Logged By: NM	Date Excavated: 6/13/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Colluvium: Medium brown silty SAND with gravels, porous, well graded, roots, medium dense.	
1.5 - 5	Saugus Formation: Light orangish brown fine to coarse grained SANDSTONE with abundant gravels and cobbles, clasts are typically 3" to 10" diameter, massive, moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

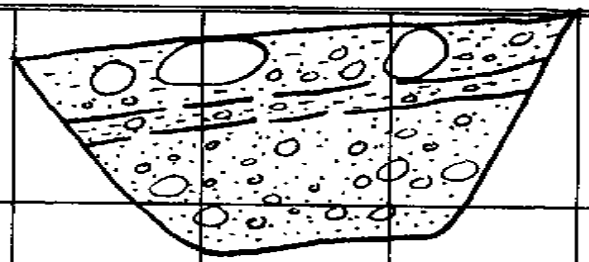


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP141

LOG OF EXCAVATION Trench No. TP142	Logged By: NM	Date Excavated: 6/13/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Colluvium: Medium brown clayey fine to coarse grained SAND with abundant gravels and cobbles (several boulders up to approximately 1-2' diameter at surface), well graded, medium dense, dry.	
1.5 - 2	Severely Weathered Saugus Formation: Orange brown coarse grained sandy gravel cobble CONGLOMERATE with clay in matrix, moist, dense.	
2 - 5.5	Saugus Formation: Light brown to light orange brown sandy gravel cobble CONGLOMERATE (sandstone matrix supported), massive, moist, very dense.	
	Total Depth - 5.5' No groundwater No caving Backfilled	

Graphic Log

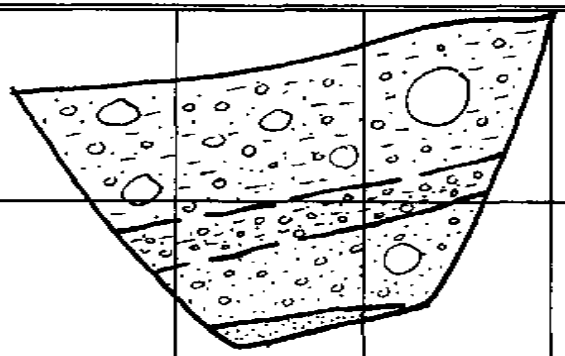


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP142

LOG OF EXCAVATION Trench No. TP143	Logged By: NM	Date Excavated: 6/13/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3.5	Colluvium: Medium brown sandy CLAY with scattered gravels and cobbles, occasional boulders up to 1' diameter, porous, moist, roots, medium stiff.	
3.5 - 4.5	Weathered Saugus Formation: Gradational contact to medium brown sandy gravel cobble CONGLOMERATE with sandy clay matrix, rootlets, slightly moist, medium dense.	
4.5 - 6.5	Saugus Formation; Light brown sandy gravel cobble CONGLOMERATE, massive, moist, very dense.	
6.5 - 7	Irregular scoured contact to light brown very fine grained SANDSTONE, poorly graded, moist, massive, very dense.	
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

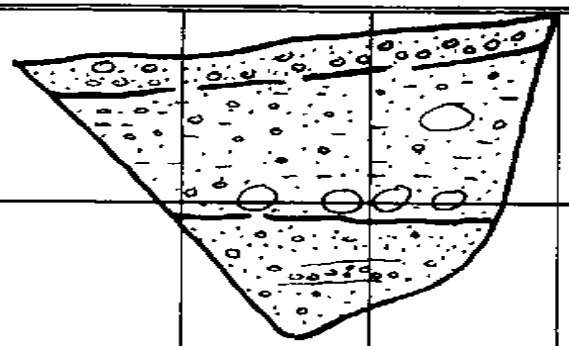


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP143

LOG OF EXCAVATION Trench No. TP144	Logged By: NM	Date Excavated: 6/13/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Medium brown clayey SAND to sandy CLAY with abundant gravels and cobbles, well graded, roots, slightly moist, medium dense to medium stiff.	
1 - 4.5	Colluvium: Medium brown sandy CLAY with scattered gravels and cobbles (higher % of clasts from 3.5-4.5' depth), occasional rootlets, moist, stiff.	
4.5 - 7	Saugus Formation: Light brown medium to coarse grained gravelly SANDSTONE with a 1' thick discontinuous interbed of gravel CONGLOMERATE from 5-6', moist, very dense.	
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

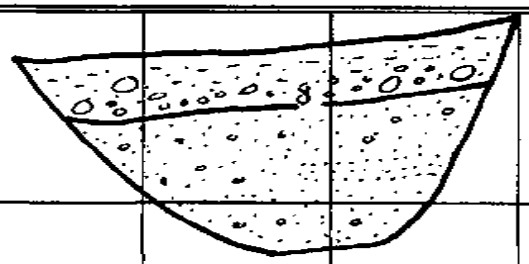


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP144

LOG OF EXCAVATION Trench No. TP145	Logged By: NM	Date Excavated: 6/13/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Colluvium: Medium brown silty clayey SAND with gravels and cobbles (mostly in bottom 6"), well graded, porous, rootlets, slightly moist to moist with depth, medium dense.	
1.5 - 5	Saugus Formation: Light yellow brown sandy gravel CONGLOMERATE to conglomeratic fine to medium grained SANDSTONE, moderately to well graded, moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

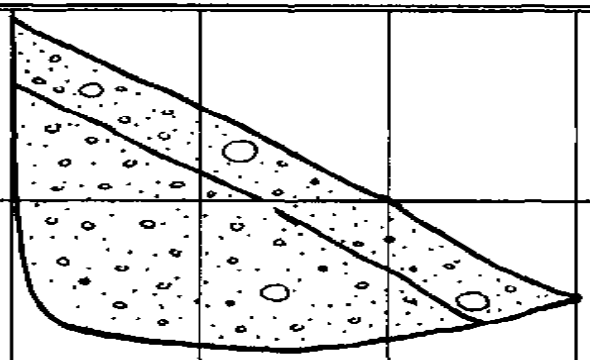


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP145

LOG OF EXCAVATION Trench No. TP146	Logged By: NM	Date Excavated: 6/13/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Colluvium: Medium brown fine to coarse grained SAND with gravel to sandy GRAVEL (mostly fine gravels), rootlets, slightly moist, medium dense.	
1.5 - 7	Landslide Deposit (remnant Saugus Formation): Light yellow brown coarse grained fine gravel CONGLOMERATE, massive, moist, very dense.	
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

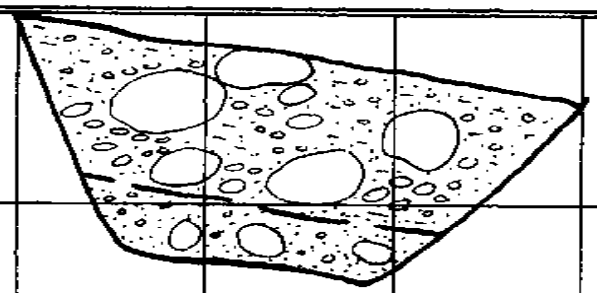


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP146

LOG OF EXCAVATION Trench No. TP147	Logged By: NM	Date Excavated: 6/13/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4	Alluvium: Medium brown silty clayey fine to coarse grained SAND with abundant gravels, cobbles, and boulders (a few 3-4' subrounded boulders at surface), approximately 15% greater than 1' diameter, well graded, less fine content with depth, dry to moist at 3.5', medium dense.	
4 - 5.5	Saugus Formation?: Light greenish gray and light brown CONGLOMERATE with fine to coarse grained sandstone supported matrix, moist, very dense, one 1.5' diameter clast.	
	Total Depth - 5.5' No groundwater No caving Backfilled	

Graphic Log

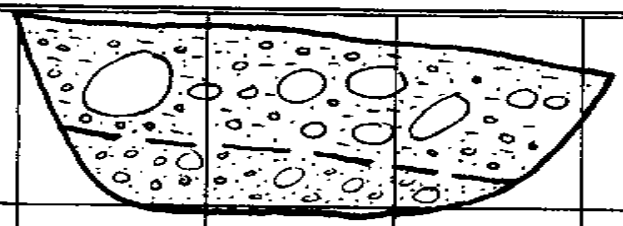


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP147

LOG OF EXCAVATION Trench No. TP148	Logged By: NM	Date Excavated: 6/13/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown silty fine to coarse grained SAND with abundant gravels, cobbles and lesser boulders (approximately 10%) approximately 15% of boulders are between 1' to 2' diameter, moist, medium dense.	
3 - 4.5	Saugus Formation?: Light orangish brown sandy gravel cobble CONGLOMERATE, moist, very dense.	
	Total Depth - 4.5' No groundwater No caving Backfilled	

Graphic Log

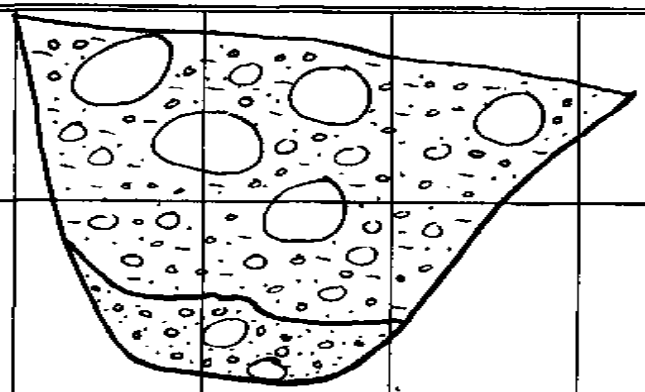


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP148

LOG OF EXCAVATION Trench No. TP149	Logged By: NM	Date Excavated: 6/13/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 7	Colluvium: Medium brown silty fine to medium grained SAND with gravels and cobbles, moist to wet with seepage at approximately 7', abundant boulders on surface up to approx. 2' diameter, medium dense, steeply incised at contact.	
7 - 8.5	Saugus Formation?: Light yellow brown sandy CONGLOMERATE with occasional boulders (one clast in bottom of trench approximately 2' diameter), very moist, very dense.	
	Total Depth - 8.5' Seep at 7' No caving Backfilled	

Graphic Log

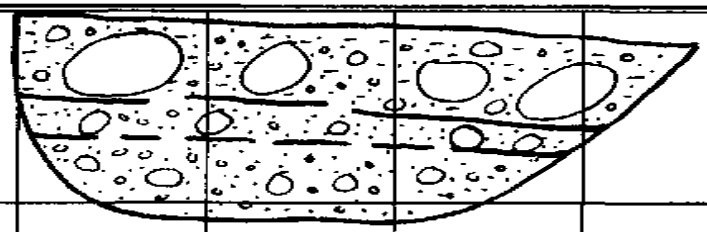


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP149

LOG OF EXCAVATION Trench No. TP150	Logged By: NM	Date Excavated: 6/13/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Alluvium: Medium to dark brown silty clayey SAND with abundant gravels and cobbles with lesser boulders (approx. 15%), subangular to rounded clasts typically a few inches diameter with 3 or 4 clasts up to 2' diameter, roots, porous, slightly moist, medium dense.	
2 - 3	Saugus Formation?: Orange brown fine to medium grained sandy gravel CONGLOMERATE, massive, slightly moist, roots, dense, highly weathered.	
3 - 5	Light yellow brown fine to medium grained sandy gravel CONGLOMERATE, massive, moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

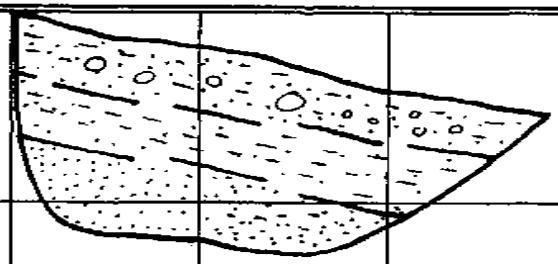


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP150

LOG OF EXCAVATION Trench No. TP151	Logged By: NM	Date Excavated: 6/14/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Alluvium: Medium to dark brown sandy CLAY with scattered gravels and cobbles (approximately 15%), rootlets, moist, porous, medium stiff.	
1.5 - 3	Saugus Formation: Light grayish brown sandy silty CLAY, moist, massive, medium stiff, occasional rootlets, highly weathered to 3'.	
3 - 5	Light brown and light reddish brown fine grained and silty fine grained SANDSTONE, poorly graded, massive, moist, very dense.	
	Total Depth - 5' No groundwate No caving Backfilled	

Graphic Log

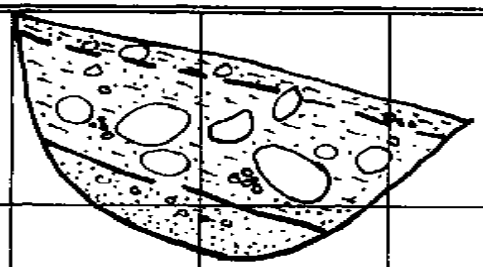


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP151

LOG OF EXCAVATION Trench No. TP152	Logged By: NM	Date Excavated: 6/14/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark brown clayey SAND with gravels, cobbles, and lesser boulders (approximately 15% greater than 1' diameter), typically 1-1.5' diameter, rootlets, porous, slightly moist, medium dense.	
1 - 3	Alluvium: Medium brown sandy CLAY with gravels, cobbles and lesser boulders (approximately 15% greater than 1' diameter, typically 1-1.5' diameter), sandy CLAY at 2', massive moist, medium stiff to stiff.	
3 - 5	Saugus Formation: Light brown fine to coarse grained SANDSTONE with scattered small gravels, moderately graded, massive. Gradational contact with medium to coarse grained SANDSTONE at 4', moist, very dense, calcium carbonate stains.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

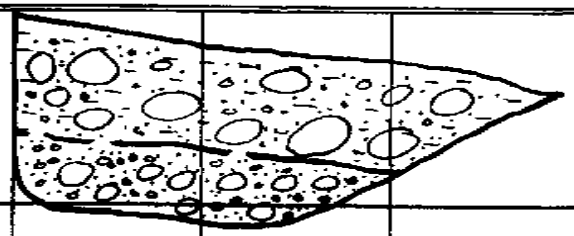


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP152

LOG OF EXCAVATION Trench No. TP153	Logged By: NM	Date Excavated: 6/14/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown fine to coarse grained clayey SAND with abundant angular to subrounded gravels, cobbles and lesser boulders (approximately 15%) up to 1.5' diameter, well graded, porous, rootlets, moist, medium dense.	
3 - 5	Saugus Formation: Light brown and light orangish brown sandy CONGLOMERATE, abundant cobbles, massive, moist, very dense, sandstone supported matrix.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

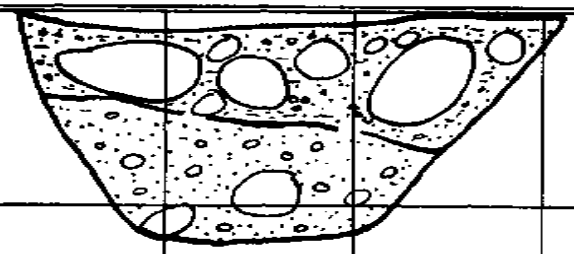


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP153

LOG OF EXCAVATION Trench No. TP154	Logged By: NM	Date Excavated: 6/14/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Alluvium: Medium brown clayey fine to coarse grained SAND with abundant gravels, cobbles and boulders (approximately 25% greater than 1' diameter), several boulders up to 3' diameter, coarsening with depth, well graded, slightly moist, medium dense.	
2.5 - 5	Saugus Formation: Light brown sandy CONGLOMERATE fine to coarse grained sandstone supported matrix, occasional boulders up to 1.5' diameter, moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

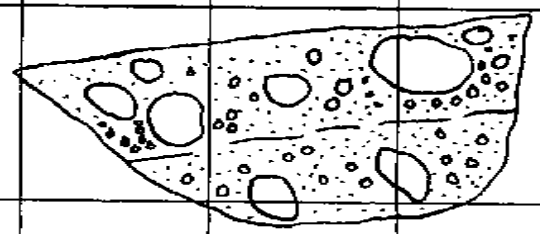


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP154

LOG OF EXCAVATION Trench No. TP155	Logged By: NM	Date Excavated: 6/14/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Alluvium: Medium brown silty fine to coarse grained SAND with abundant gravels, cobbles and boulders (approximately 25% greater than 1' diameter up to approximately 2.5' diameter), moist, medium dense, rootlets.	
2.5 - 5	Saugus Formation: Light orangish to light brown fine to coarse grained sandy CONGLOMERATE with several 1.5' diameter clasts of granite/tonalite, moist to very moist with depth, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

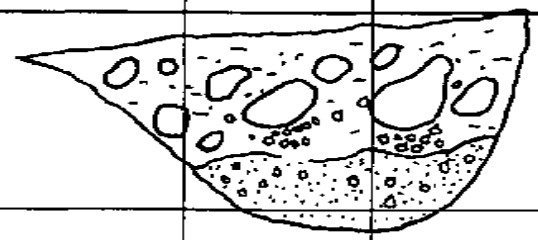


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP155

LOG OF EXCAVATION Trench No. TP156	Logged By: NM	Date Excavated: 6/14/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown clayey silty fine to coarse grained SAND with abundant angular to subrounded gravels, cobbles and lesser boulders (approximately 10% greater than 1' diameter up to 2' diameter), pockets of medium to coarse grained SAND at 2', well graded, rootlets, moist, medium dense.	
3 - 5	Saugus Formation: Irregular undulating contact to light brown gravel cobble CONGLOMERATE (approximately 40% fine to coarse grained sandstone supported matrix), massive, moist to very moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

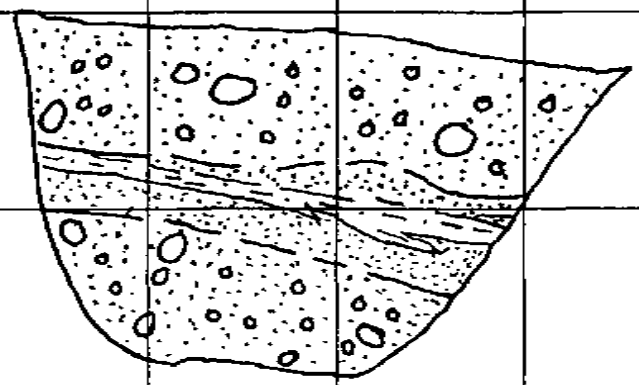


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP156

LOG OF EXCAVATION Trench No. TP157	Logged By: NM	Date Excavated: 6/14/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3.5	Colluvium: Medium brown sandy CLAY with gravels and cobbles, occasional boulders approximately 1' diameter, moist, stiff, rootlets.	
3.5 - 4'2"	Saugus Formation: Gradational contact with light brown silty very fine grained SANDSTONE, moderately graded, massive, slightly moist, very dense.	
4'2" - 4'10"	Light medium brown SILTSTONE ranging from 3" to 8" thick, base is interfingered with sandstone below, semi planar contacts with a discontinuous paper thin silty claystone bed at base, moist, very stiff.	
4'10" - 5'4"	Light reddish brown silty fine to medium grained SANDSTONE, moderately graded, massive with semi planar contact at base.	
5'4" - 8.5	Light brown to light greenish brown fine to coarse grained SANDSTONE with gravels and cobbles (conglomeratic sandstone).	
	Total Depth - 8.5' No groundwater No caving Backfilled	

Graphic Log

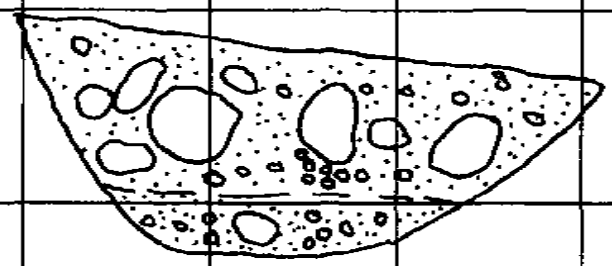


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP157

LOG OF EXCAVATION Trench No. TP158	Logged By: NM	Date Excavated: 6/14/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4	Alluvium: Medium brown clayey fine to coarse grained SAND with abundant gravels, cobbles and boulders (approximately 35% greater than 1' diameter), boulder clasts typically 1-2' diameter, well graded with discontinuous pockets up to 1' thick of coarse sand, moist to very moist at base, medium dense.	
4 - 6	Saugus Formation: Light brown sandy CONGLOMERATE, very moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

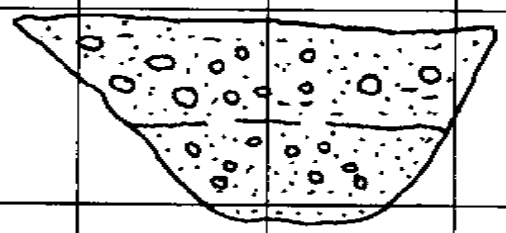


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP158

LOG OF EXCAVATION Trench No. TP159	Logged By: NM	Date Excavated: 6/14/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Alluvium: Medium brown silty SAND with gravels and cobbles up to 1' diameter, porous, well graded, rootlets, moist, medium dense.	
2.5 - 5	Saugus Formation: Light brown fine to coarse grained SANDSTONE with gravels (conglomeratic sandstone), moderately to well graded, massive, moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

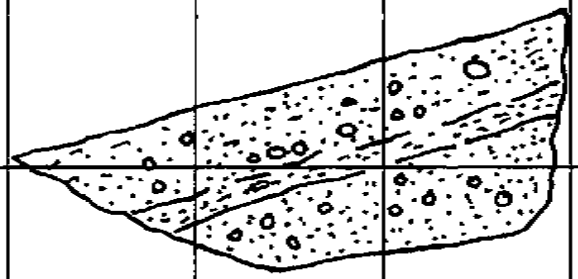


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP159

LOG OF EXCAVATION Trench No. TP160	Logged By: NM	Date Excavated: 6/14/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Colluvium: Medium to dark brown fine to coarse grained sandy CLAY to clayey SAND with gravels and occasional cobbles, porous, rootlets, slightly moist, medium stiff.	
2 - 2.5	Weathered Saugus Formation: Red brown fine to coarse grained sandy CLAY, moist, stiff.	
2.5 - 5	Saugus Formation: Light yellowish brown fine to coarse grained SANDSTONE with scattered gravels (approximately 10%), moderately graded, massive, moist, very dense	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

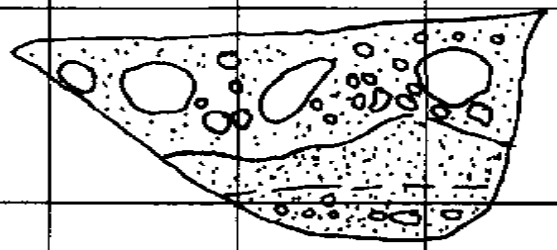


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP160

LOG OF EXCAVATION Trench No. TP161	Logged By: NM	Date Excavated: 6/15/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown clayey fine to coarse grained SAND with gravels, cobbles and boulders (approximately 25% greater than 1' diameter), boulders typically 1.5-2' diameter, mostly granitic, well graded, rootlets, moist, medium dense.	
3 - 5.5	Saugus Formation: Irregular undulating contact with light brown fine grained SANDSTONE, poorly graded with a gradational flat lying contact at approximately 4', with light yellowish brown fine to coarse grained SANDSTONE with gravels and cobbles (approximately 20%), moderately graded, moist, very dense.	
	Total Depth - 5.5' No groundwater No caving Backfilled	

Graphic Log

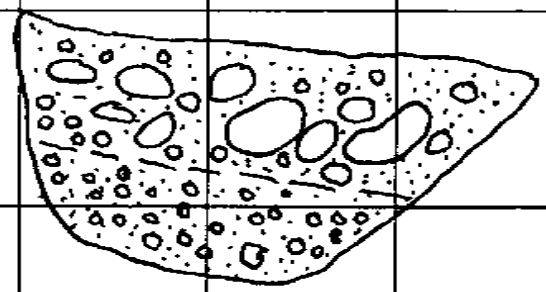


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP161

LOG OF EXCAVATION Trench No. TP162	Logged By: NM	Date Excavated: 6/15/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown clayey silty SAND with gravels, cobbles and boulders (approximately 25% greater than 1' diameter), boulders typically 1-2' diameter, well graded, rootlets, dry at surface to moist with depth, medium dense.	
3 - 6	Saugus Formation: Gradational contact witho orangish brown and light reddish brown fine to coarse grained sandy CONGLOMERATE (abundant gravels and cobbles), massive, moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log



scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP162

LOG OF EXCAVATION Trench No. TP163	Logged By: NM	Date Excavated: 6/15/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Alluvium: Medium brown clayey silty SAND with gravels, cobbles and lesser boulders (approximately 5%) up to 1.5' diameter, well graded, rootlets, slightly moist, medium dense.	
3 - 6	Saugus Formation: Gradational contact with light reddish brown silty fine grained SANDSTONE with coarse sand grains, moderately graded, massive, moist, very dense, calcium carbonate stains in upper 2'.	
	Total Depth - 6' No groundwater No caving Backfilled	

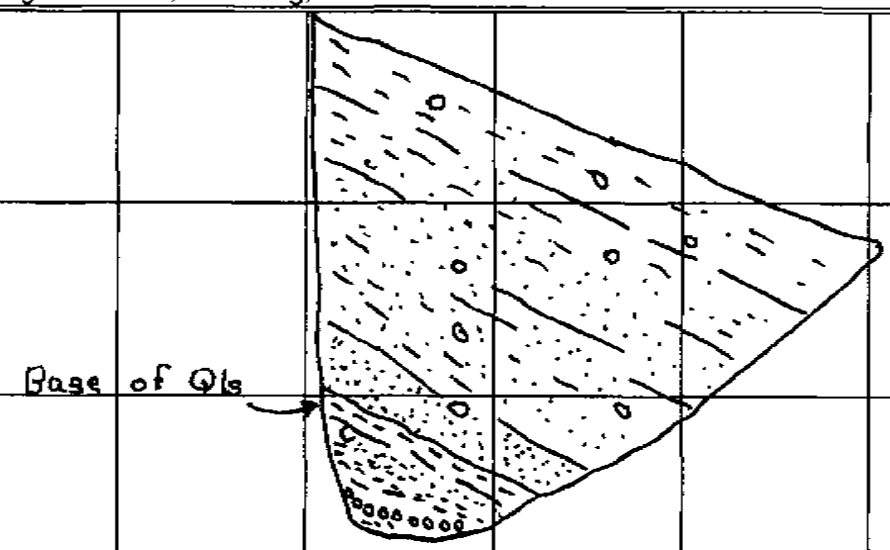
Graphic Log

scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP163

LOG OF EXCAVATION Trench No. TP164	Logged By: NM	Date Excavated: 6/15/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2'	Topsoil: Medium brown sandy CLAY with occasional gravels, porous, rootlets.	
2 - 9	Landslide Debris: Crudely interbedded light medium brown silty fine to coarse grained SAND and medium brown sandy CLAY, occasional graevls, discontinuous wavy contact, abundant rootlets, pinhole porosity.	
9 - 9'8"	Medium brown sandy CLAYSTONE, grading to silty CLAYSTONE in bottom 2-3 inches (possible base of slide but with no clearly defined bounding surface), slightly polished when picked fresh, moist, massive, stiff.	
9'8" - 10'4"	Saugus Formation?: Contact not planar but clear to light brown silty fine grained SANDSTONE, massive, moist, very dense.	
10'4" - 10'7"	Grading to medium brown silty CLAY, massive, moist, very stiff.	
10'7" - 11'7"	Grading to light brown sandy SILTSTONE, massive, moist, very stiff.	
11'7" - 12.5	Light grayish brown fine to coarse grained SANDSTONE with abundant fine gravels, well graded, massive, calcium carbonate stains, moist, very dense to hard. Total Depth - 12.5', No groundwater, No caving, Backfilled	

Graphic Log

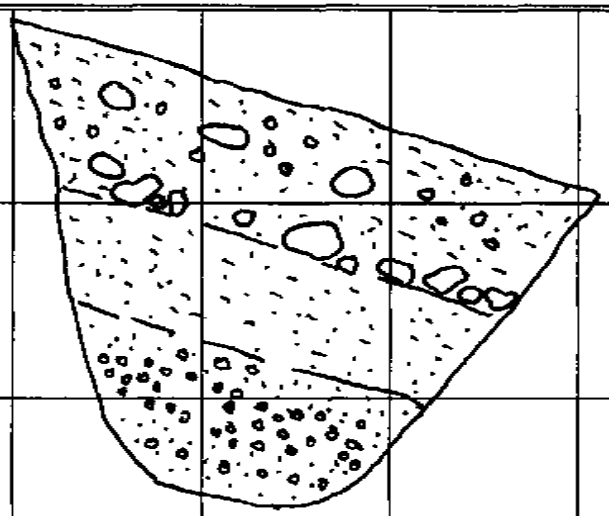


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP164

LOG OF EXCAVATION Trench No. TP165	Logged By: NM	Date Excavated: 6/16/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4.5	Landslide Debris?: Medium brown silty sandy CLAY with scattered gravels and cobbles, several boulders at base up to 14" diameter, well graded, moist, medium stiff.	
4.5 - 7	Gradational contact with medium brown silty very fine grained SANDSTONE, massive, moist, very dense.	
7 - 13	Saugus Formation?: Gradational contact to medium brown to light reddish brown silty fine grained SANDSTONE with coarse sand and fine gravel, 8-10' has higher concentration of small gravels (approximately 40%), massive with occasional vague flat lying gradational contacts, moist, very dense.	
	Total Depth - 13' No groundwater No caving Backfilled	

Graphic Log

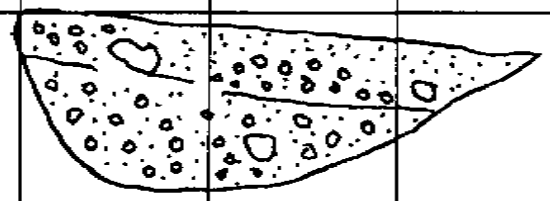


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP165

LOG OF EXCAVATION Trench No. TP166	Logged By: NM	Date Excavated: 6/16/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Alluvium: Medium brown fine to coarse grained gravelly SAND with scattered cobbles and very sparse boulders up to 1.5' diameter (one at surface approximately 2' diameter), well graded, loose to medium dense, dry, rootlets.	
1.5 - 4	Saugus Formation: Light brown sandy CONGLOMERATE with fine to coarse grained sandstone supported matrix, massive, moist, very dense.	
	Total Depth - 4' No groundwater No caving Backfilled	

Graphic Log

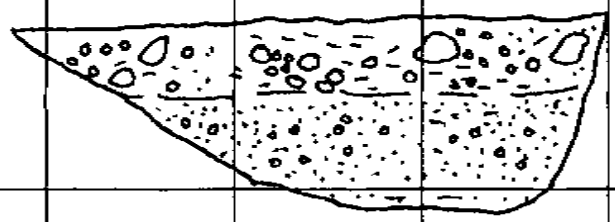


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP166

LOG OF EXCAVATION Trench No. TP167	Logged By: NM	Date Excavated: 6/16/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Alluvium: Medium brown silty fine to coarse grained SAND with gravels, cobbles, and sparse boulders (approximately 1' diameter), well graded, porous, rootlets, dry to moist with depth, medium dense.	
2 - 5	Saugus Formation: Gradational contact with medium brown silty fine grained SANDSTONE with coarse sand and fine gravel massive, moist, very dense.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

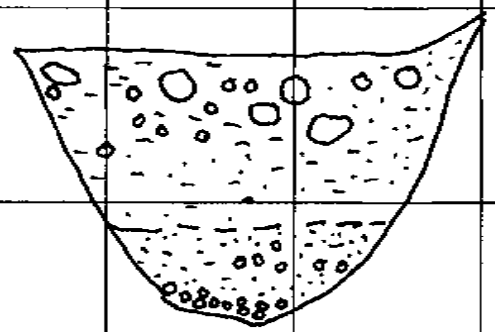


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP167

LOG OF EXCAVATION Trench No. TP168	Logged By: NM	Date Excavated: 6/16/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 4.5	Alluvium: Medium brown sandy CLAY with scattered angular to subrounded gravels, cobbles and lesser boulders (in upper 18") up to 1.5' diameter, rootlets, moist, medium stiff to stiff with deph.	
4.5 - 7	Saugus Formation: Light medium brown silty fie to medium grained SANDSTONE with occasional coarse sand and fine gravel at 6', grades to silty fine to medium grained SANDSTONE with abundant coarse sand and small gravels, massive, moist, very dense.	
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

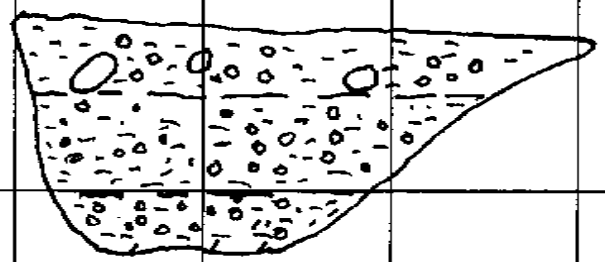


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP168

LOG OF EXCAVATION Trench No. TP169	Logged By: NM	Date Excavated: 6/16/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Alluvium: Medium brown silty clayey SAND with gravels, cobbles and occasional boulders, approximately 1' diameter, well graded, slightly moist, medium dense, rootlets.	
2 - 4.5	Saugus Formation: Gradational contact with light reddish brown silty fine to medium grained SANDSTONE with scattered coarse sand and sparse fine gravels, calcium carbonate stains, rootlets, massive, moist, dense, highly weathered to 4.5'.	
4.5 - 6	Grading to light reddish brown to medium brown fine to medium grained SANDSTONE with scattered coarse sand and fine subangular to rounded fine gravels, massive, moist, very dense.	
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

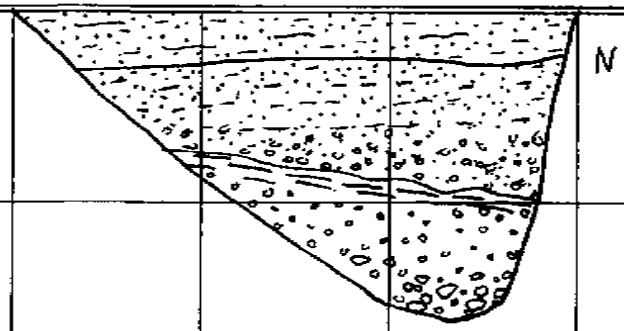


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP169

LOG OF EXCAVATION Trench No. TP170	Logged By: RMP	Date Excavated: 8/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Topsoil: Dark brown fine to medium grained sandy clayey SILT, graded, stiff, moist, rootlets.	
1.5 - 3	Saugus Formation: Yellowish brown sandy SILTSTONE, poorly graded, very stiff, moist, weakly indurated.	
3 - 5	Grades to subangular to subrounded fine grained gravel CONGLOMERATE with weakly cemented silty fine to coarse sand matrix, well graded, dense, moist.	@5' B N86W/28NE
5 - 5.5	Dark brown CLAYSTONE, poorly graded, very stiff, moist, sheared, variable thickness (1-6" thick) but continuous, wavy upper contact.	
5.5 - 8	Grades to subangular to subrounded yellow brown fine grained gravel CONGLOMERATE, well graded, dense, moist, trace cobbles.	
	Total Depth - 8' No groundwater No caving Backfilled	

Graphic Log

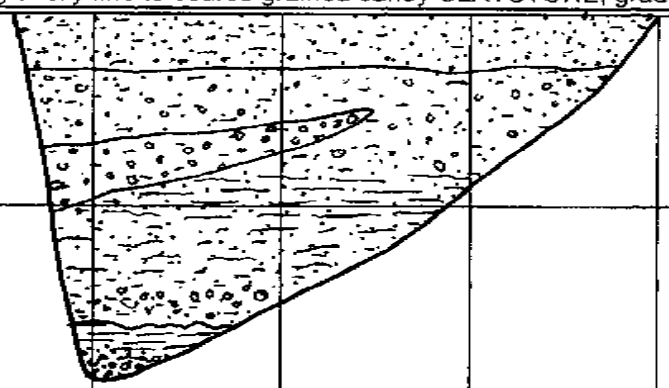


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP170

LOG OF EXCAVATION Trench No. TP171	Logged By: RMP	Date Excavated: 8/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Topsoil: Brown silty fine to coarse grained SAND, graded, dense, dry to moist, with depth, rootlets.	
1.5 - 3.5	Saugus Formation: Yellowish brown fine grained gravelly silty fine to coarse grained SANDSTONE, graded, dense, moist, weakly cemented.	
3.5 - 4.5	1' thick channeled sand in east wall, yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, dense, moist.	
4.5 - 5.5	Brown silty CLAYSTONE with fine to coarse sand, graded, hard, moist.	
5.5 - 5.7	Grades to yellowish brown subangular to subrounded fine to coarse grained gravel CONGLOMERATE with weakly cemented silty fine to coarse sand matrix, well graded.	
5.7 - 7	Brown fine to coarse grained sandy silty CLAYSTONE, graded, hard, moist.	
7 - 8	Grades to yellowish brown subangular to subrounded fine to coarse grained gravel CONGLOMERATE with weakly cemented silty fine to coarse sand matrix, well graded.	
8 - 9.5	1.5' thick dark yellowish brown CLAYSTONE, hard, moist, sheared, waxy.	Total Depth - 9.5' No groundwater No caving
@9.5'	Grades to fine grained gravelly fine to coarse grained sandy CLAYSTONE, graded, hard, moist, weakly indurated.	Backfilled

Graphic Log

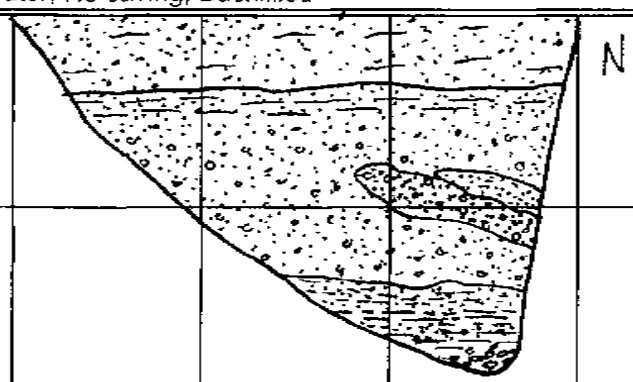


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP171

LOG OF EXCAVATION Trench No. TP172	Logged By: RMP	Date Excavated: 8/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Topsoil: Dark brown clayey fine to coarse grained SANDSTONE, graded, dense, moist, rootlets, pervasive white carbonate veinlets in lower 6".	
2 - 3.5	Saugus Formation: 4" thick dark yellowish brown fine to medium grained sandy CLAYSTONE, very stiff, moist.	
3.5 - 5.5	Grades to yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with weakly cemented to slightly friable clayey fine to coarse sand matrix, well graded, dense, moist.	
5.5 - 6.5	Reddish brown fine grained gravelly clayey fine to medium grained SANDSTONE, graded, dense, moist, weakly indurated, discontinuous.	
6.5 - 7.5	Discontinuous channeled sand in head wall and part of west wall, yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, dense.	
7.5 - 8	6" thick yellowish brown fine to medium grained sandy SILTSTONE, poorly graded, very stiff, moist.	
8 - 8'8"	2" thick dark yellowish brown silty CLAYSTONE, grades to 6" thick silty fine grained SANDSTONE interbed.	
8'8" - 9.5	CLAYSTONE grades to fine grained gravel CONGLOMERATE at 9'.	
	Total Depth - 9.5', No groundwater, No caving, Backfilled	

Graphic Log

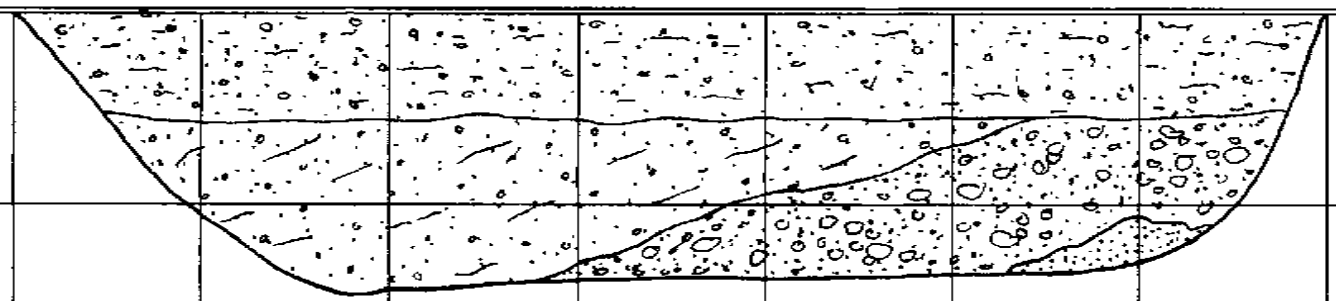


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP172

LOG OF EXCAVATION Trench No. TP173	Logged By: RMP	Date Excavated: 8/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Topsoil: Dark brown fine to coarse grained SAND with clay, silt, and gravel, well graded, dense, dry to moist with depth, subangular to subrounded clasts, rootlets.	
3 - 4	Saugus Formation: Yellowish brown clayey fine to coarse grained SAND with fine gravel, graded, very dense, moist, weakly indurated, clasts are subangular to subrounded.	
4 - 5.5	Grades to yellowish brown subangular to subrounded fine grained gravel-cobble CONGLOMERATE with slightly friable to weakly cemented silty fine to coarse sand matrix, well graded, very dense, moist.	
5.5 - 7	Sharp scoured contact with yellowish brown silty fine to medium grained SANDSTONE, poorly graded, very dense, moist, weakly to moderately indurated, grades to coarse sand at 6', mottled appearance.	BN26W/27SW
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log



scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP173

LOG OF EXCAVATION Trench No. TP174	Logged By: RMP	Date Excavated: 8/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark brown clayey silty fine to coarse grained SAND, graded, dense, dry to moist with depth, rootlets.	
1 - 1.5	Saugus Formation: Yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with fine to coarse sand matrix, matrix, well graded, dense, moist, pervasive fractures, rootlets	
1.5 - 2	Yellowish brown fine grained sandy SILTSTONE, poorly graded, very stiff, moist, rootlets, pervasive fractures.	
2 - 2.5	1" thick fine grained gravel layer.	BN46W/10SW
2.5 - 4.5	Grades to yellowish brown subangular fine grained gravelly fine to coarse grained SANDSTONE with silt, graded, very dense, moist, weakly indurated, upper 6" pervasively fractured.	
4.5 - 6	Grades to yellowish brown subangular to subrounded gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, very dense, moist.	
	Total Depth - 6' (refusal on cobble) No groundwater No caving Backfilled	

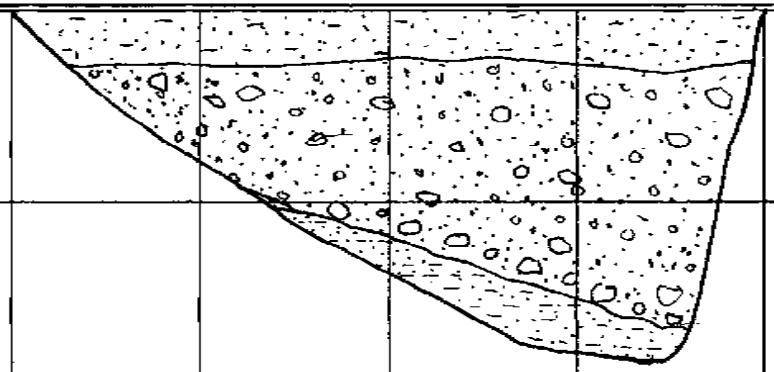
Graphic Log

scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP174

LOG OF EXCAVATION Trench No. TP175	Logged By: RMP	Date Excavated: 8/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Topsoil: Dark brown to yellowish brown fine grained gravelly silty fine to coarse grained SAND, graded, medium dense, moist.	.
1.5 - 8	Terrace Deposits: Pale yellowish brown subangular to subrounded cobble GRAVEL with slightly friable fine to coarse sand matrix, well graded, very dense, moist, weathered to 8.5', rootlets to 7'.	
8 - 9	Saugus Formation: Sharp, wavy, and slightly scoured contact with yellowish brown fine grained sandy SILTSTONE, poorly graded, very dense, moist.	@8.5' Approx. CN2E/36SE
	Total Depth - 9' No groundwater No caving Backfilled	

Graphic Log

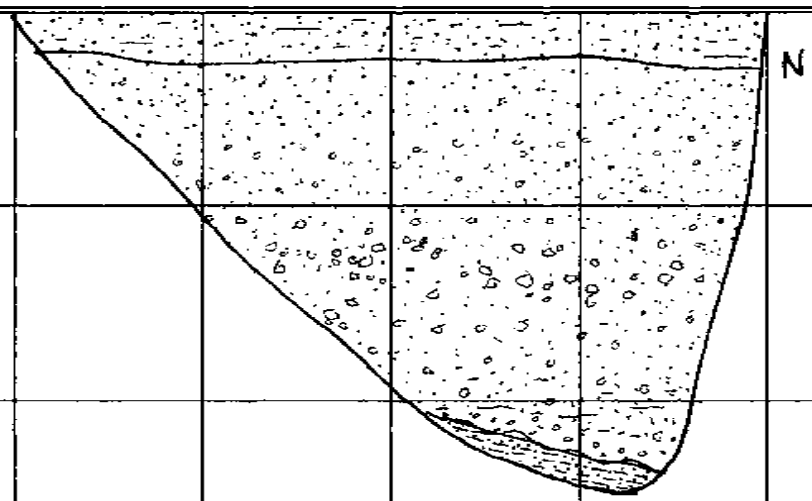


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP175

LOG OF EXCAVATION Trench No. TP176	Logged By: RMP	Date Excavated: 8/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark brown clayey silty fine to coarse grained SAND, graded, dense, dry to moist with depth, rootlets.	
1 - 2	Saugus Formation: Dark brown clayey silty fine to coarse grained SANDSTONE, graded, very dense, moist.	
2 - 3	Yellowish brown silty fine to medium grained SANDSTONE, poorly graded, very dense, moist.	
3 - 4.5	Pale brown fine grained gravelly silty fine to medium grained SANDSTONE, graded, dense, moist, pervasively fractured, pervasive white carbonate veins, rootlets.	
4.5 - 6	Grades to pale brown silty fine to coarse grained SANDSTONE, poorly graded to graded, very dense, moist, carbonate veins, no fractures.	
6 - 9	Grades to yellowish brown subangular to subrounded fine to coarse grained gravel CONGLOMERATE with silty fine to coarse sand matrix, well graded, very dense, moist.	
9 - 10.5	Yellowish brown fine grained gravelly fine to coarse grained SANDSTONE with silt and clay, graded, very dense, very moist.	
10.5 - 11	Grades to fine grained gravel CONGLOMERATE.	Total Depth - 12' No groundwater
11 - 12	Sharp, wavy, slightly scoured contact with dark yellowish brown fine to coarse grained sandy SILTSTONE, poorly graded, hard, moist.	No caving Backfilled

Graphic Log

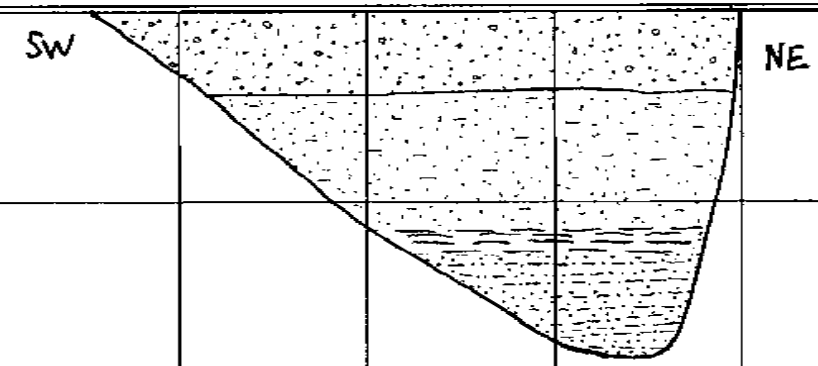


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP176

LOG OF EXCAVATION Trench No. TP177	Logged By: RMP	Date Excavated: 8/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Topsoil: Brown silty fine to medium grained SAND with gravel, poorly graded, medium dense, moist.	
2 - 3.5	Saugus Formation: Dark yellowish brown silty fine to coarse grained SANDSTONE with gravel, graded, dense, moist, weakly indurated, blocky appearance, pervasive fracturing.	
3.5 - 6.5	Pervasive, dry, white carbonate veins for 1.5'	
6.5 - 6'10"	4" thick dark yellowish brown CLAYSTONE, pervasively sheared, waxy, highly plastic, no dominant shear plane, although shears are roughly parallel to bedding.	BN15E/9NW
6'10" - 9	Dark yellowish brown fine to medium grained sandy SILTSTONE, poorly graded, hard, moist.	
	Total Depth - 9' No groundwater No caving Backfilled	

Graphic Log

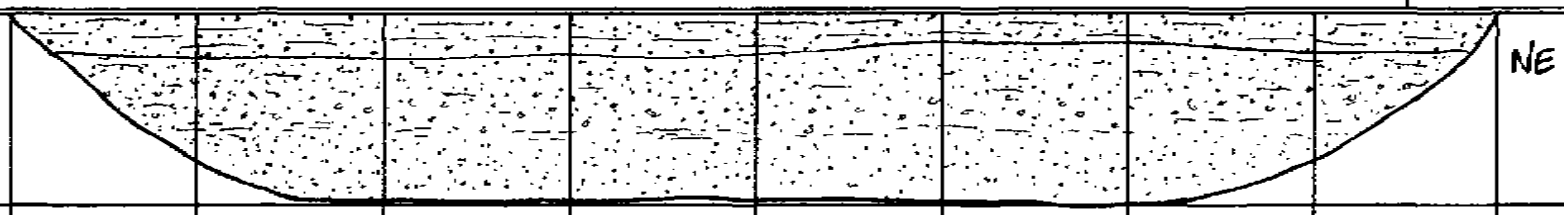


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP177

LOG OF EXCAVATION Trench No. TP178	Logged By: RMP	Date Excavated: 8/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Brown very clayey fine to coarse grained SAND, graded, dense, moist.	
1 - 2	Saugus Formation: Yellowish brown clayey silty fine to coarse grained SANDSTONE, graded, dense to very dense, moist, weakly indurated, dry, white carbonate veins throughout, rootlets.	
2 - 2.5	Fine grained gravels in SANDSTONE.	
2.5 - 3	Mottled appearance (brown, olive green, yellowish brown) in SANDSTONE, olive green colored material is finer grained (fine to medium grained sandy clayey SILTSTONE).	
3 - 5	Grades to yellow brown fine to medium grained SANDSTONE, hard, moist.	
	Total Depth - 5' No groundwater No caving Backfilled	

Graphic Log

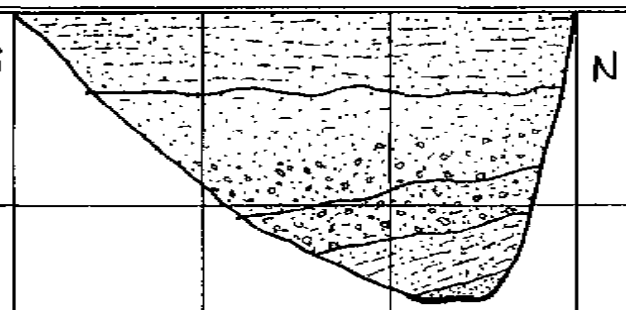


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP178

LOG OF EXCAVATION Trench No. TP179	Logged By: RMP	Date Excavated: 8/2/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Topsoil: Brown to yellowish brown silty fine to medium grained SAND to fine to medium grained sandy SILT, poorly graded, medium dense to stiff, dry.	
2 - 2.5	Saugus Formation: Yellowish brown silty fine to coarse grained SANDSTONE, graded, dense, dry, rootlets, weakly indurated.	
2.5 - 4	Grades to subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, dense, dry, rootlets, pervasively fractures.	
4 - 5.5	Olive green subangular to subrounded fine to coarse grained gravel CONGLOMERATE with weakly cemented silty fine to coarse sand matrix, well graded, very dense, moist.	BN69W/8SW
5.5 - 6	Yellowish brown silty fine grained SANDSTONE to fine grained sandy SILTSTONE, poorly graded, hard, moist, weakly indurated.	
6 - 7	Olive green silty fine to coarse grained SANDSTONE, hard, moist, weakly indurated.	
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

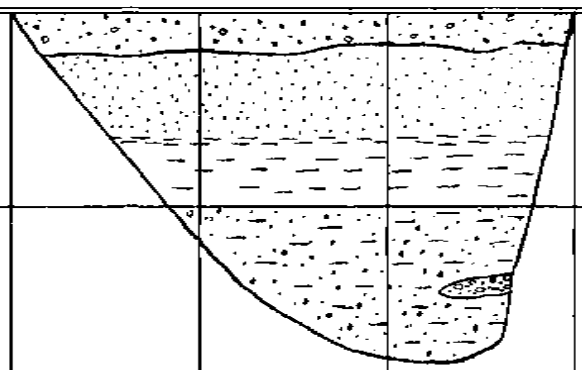


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP179

LOG OF EXCAVATION Trench No. TP180	Logged By: RMP	Date Excavated: 8/4/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Topsoil: Dark brown silty fine to coarse grained SAND with subangular fine gravel, graded, medium dense, moist, weakly cemented, rootlets.	
1.5 - 3.5	Colluvium: Yellowish brown very silty fine grained SAND, poorly graded, medium dense, moist, weakly cemented, pervasive fracturing filled with white carbonate veins, rootlets.	
3.5 - 4	6" thick dark yellowish brown fine to medium grained sandy silty CLAY, poorly graded, very stiff, moist, non-plastic, weakly cemented.	
4 - 7	Saugus Formation; Mottled dark yellowish brown silty fine grained SANDSTONE to fine grained sandy SILTSTONE, poorly graded, very dense to hard, moist, weakly cemented, and olive green clayey silty fine to coarse grained SANDSTONE, graded, very dense, moist, weakly cemented.	@7' CH N45W/14SW
7 - 9	3-4" thick discontinuous channel deposit, olive green fine gravel CONGLOMERATE with silty fine to coarse sand matrix, graded, weakly cemented, subangular to subrounded.	
	Total Depth - 9' No groundwater No caving Backfilled	

Graphic Log

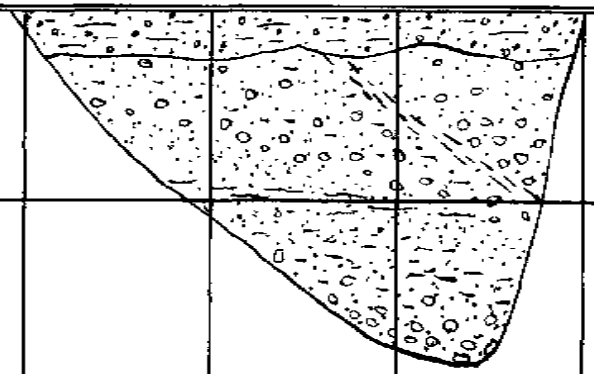


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP180

LOG OF EXCAVATION Trench No. TP181	Logged By: RMP	Date Excavated: 8/4/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Topsoil: Dark brown clayey silty fine to coarse grained SAND with fine gravel, graded, medium dense, moist, weakly cemented, rootlets.	
1.5 - 9	Saugus Formation: Weathered to 4' (rootlets).	
2.5 - 3	Grades to dark yellowish brown coarse gravel CONGLOMERATE with silty fine to medium sand matrix, well graded, dense, moist, subounded to rounded, weakly cemented, pervasive carbonate veinlets.	
3 - 4	Yellowish brown silty fine to coarse grained SANDSTONE with fine gravel, graded, dense, moist, weakly cemented.	
4 - 5	Color change to pale brown, lose silt, gravels coarsen to cobbles.	
5 - 5'3"	Wavy slightly scoured contact with 3" thick dark yellowish brown CLAYSTONE, poorly graded, very stiff, moist, slightly plastic.	@5' B N75E/37NW
5'3" - 8	Grades to yellowish brown clayey silty fine to coarse grained SANDSTONE, graded, moist, weakly cemented.	
8 - 9	Grades to pale brown cobble CONGLOMERATE with silty fine to coarse sand matrix, well graded, dense, moist, slightly friable, subrounded.	@8.5' B N61E/25NW
	Total Depth - 9' No groundwater, No caving, Backfilled	

Graphic Log

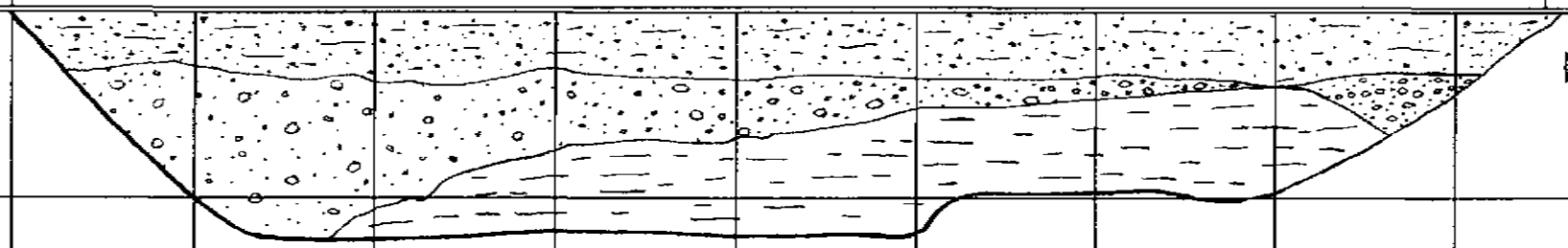


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP181

LOG OF EXCAVATION Trench No. TP182	Logged By: RMP	Date Excavated: 8/4/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Topsoil: Dark brown clayey silty fine to coarse grained SAND with fine gravel, graded, medium dense, moist, weakly cemented, rootlets.	
2 - 6	Saugus Formation: Weathered to 6' (rootlets, carbonate veins), pale brown gravel to cobble CONGLOMERATE with silty fine to coarse sand matrix, well graded, moist, slightly friable, subrounded, overlying highly scoured contact with dark yellowish brown silty CLAYSTONE, poorly graded, very stiff, moist, non-plastic, weakly cemented, pervasive carbonate veins, contact is sharp in northern portion of trench on west wall only, other walls have scoured contact.	@2' C N88W/49NE @2.5' B Approximate N79E/19SE
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

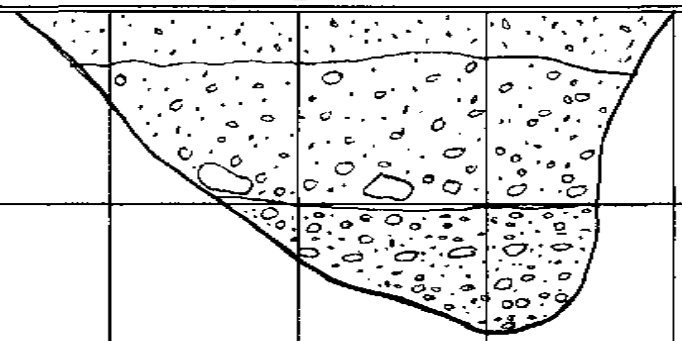


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP182

LOG OF EXCAVATION Trench No. TP183	Logged By: RMP	Date Excavated: 8/4/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Topsoil: Dark brown silty fine to coarse grained SAND with fine gravel, graded, loose, dry, slightly friable, rootlets.	
1.5 - 5	Terrace Deposits: Reddish brown fine to coarse grained gravel CONGLOMERATE with fine to coarse sand matrix, well graded, dense, moist, subangular to subrounded, weakly cemented, grades to cobble CONGLOMERATE at base with trace boulders.	
5 - 7	Saugus Formation: Weathered to 7' (rootlets), yellowish brown cobble CONGLOMERATE with fine to coarse sand matrix, well graded, dense, moist, slightly friable, subrounded to rounded.	@6' B N7W/16SW
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

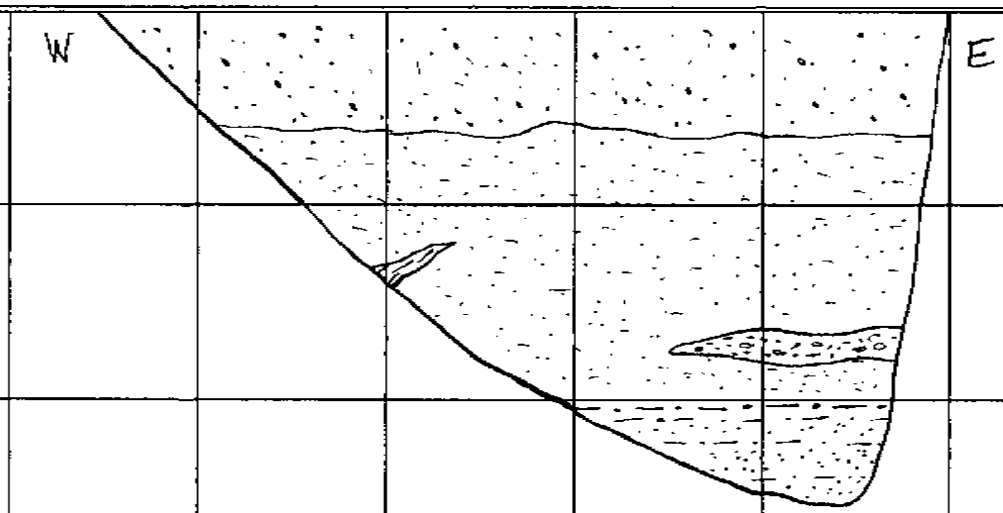


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP183

LOG OF EXCAVATION Trench No. TP184	Logged By: RMP	Date Excavated: 8/4/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Topsoil: Brown silty fine to coarse grained SAND with fine gravel, graded, loose, dry, slightly friable, rootlets.	
3 - 12.5	Weathered Saugus Formation: Yellowish brown clayey silty fine to coarse grained SANDSTONE, graded, medium dense, moist, slightly friable, occasional subangular to subrounded gravels and cobbles, rootlets to 8'.	
7 - 7'3"	1-3" thick discontinuous red clayey SILTSTONE to silty CLAYSTONE, poorly graded, stiff, moist, slightly plastic.	
8 - 8.5	6" thick discontinuous pale brown silty fine to coarse grained SANDSTONE with fine gravel.	
8.5 - 12.5	Silty fine grained SANDSTONE to fine grained sandy SILTSTONE, poorly graded, dense, moist, grades down to yellowish brown clayey silty fine to coarse grained SANDSTONE, graded, medium dense, moist, slightly friable.	
	Total Depth - 12.5' No groundwater No caving Backfilled	

Graphic Log

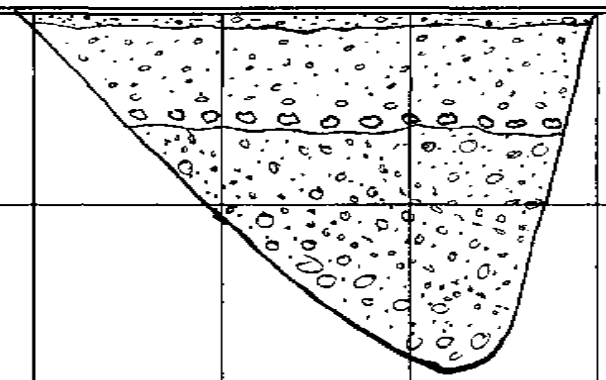


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP184

LOG OF EXCAVATION Trench No. TP185	Logged By: RMP	Date Excavated: 8/4/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 0.5	Topsoil: Dark brown silty fine to coarse grained SAND with fine gravel, graded, loose, dry, slightly friable, rootlets.	
0.5 - 3	Terrace Deposits: Reddish brown fine grained GRAVEL with fine to coarse sand matrix, well graded, dense, moist, weakly cemented, subangular to subrounded, upper foot fractured and blocky, rootlets, grades to cobble GRAVEL at base.	
3 - 9	Saugus Formation: Yellowish brown gravel to cobble CONGLOMERATE with fine to coarse sand matrix, well graded, dense, moist, slightly friable, subangular to subrounded.	@5' B N80W/37NE
	Total Depth - 9' No groundwater No caving Backfilled	

Graphic Log

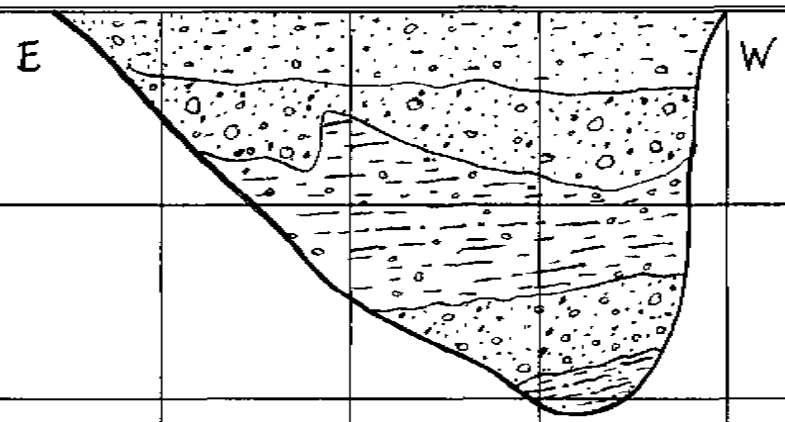


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP185

LOG OF EXCAVATION Trench No. TP186	Logged By: RMP	Date Excavated: 8/4/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Topsoil: Dark brown silty fine to coarse grained SAND with fine gravel, graded, medium dense, dry, rootlets, weakly cemented.	
2 - 4	Colluvium: Yellowish brown fine to coarse grained GRAVEL with fine to coarse sand matrix, well graded, medium dense, moist, slightly friable.	
4 - 7	Highly irregular contact with mottled yellowish brown clayey SILT and dark yellowish brown silty CLAY, poorly graded, stiff, moist, non-plastic, weakly cemented.	
7 - 9	Saugus Formation: Weathered to 9', rootlets to 8', pale brown gravel to cobble CONGLOMERATE with silty fine to coarse sand matrix, well graded, dense, moist, slightly friable, occasional rootlets in upper foot.	@8' B N76W/24NE
9 - 10	Yellowish brown clayey SILTSTONE, poorly graded, very stiff, moist, weakly cemented, massive.	
	Total Depth - 10' No groundwater No caving Backfilled	

Graphic Log

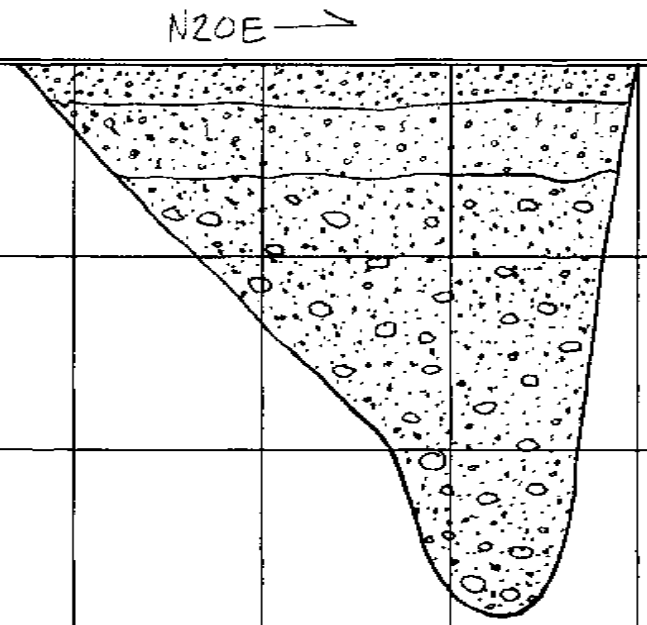


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP186

LOG OF EXCAVATION Trench No. TP187	Logged By: RMP	Date Excavated: 8/4/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark brown silty fine to coarse grained SAND with fine gravel, graded, loose, dry, slightly friable, rootlets.	
1 - 2.5	Saugus Formation: Weathered to 14', rootlets, reddish brown fine grained gravel CONGLOMERATE with silty fine to coarse sand matrix, graded, dense, moist, weakly cemented, clasts are subangular to subrounded.	
2.5 - 14	Yellowish brown subrounded cobble CONGLOMERATE with friable fine to coarse sand matrix, well graded, dense, moist.	@4' Approx. BN79E/14NW
	Total Depth - 14' No groundwater No caving Backfilled	

Graphic Log



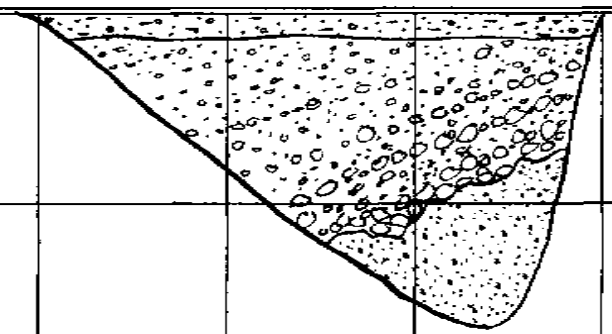
scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP187

LOG OF EXCAVATION Trench No. TP188	Logged By: RMP	Date Excavated: 8/4/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark brown silty fine to coarse grained SAND with fine gravel, graded, loose, dry, friable, rootlets.	
1 - 6	Saugus Formation: Weathered to 6.5' (rootlets), yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable to weakly cemented clayey silty fine to coarse sand matrix, well graded, very dense, moist, rootlets, clasts coarsen to cobbles with depth.	@3.5' B N11W/6SW
6 - 8	Wavy, scoured contact with yellowish brown fine to coarse grained SANDSTONE, poorly graded, very dense, moist, weakly cemented.	
	Total Depth - 8' No groundwater No caving Backfilled	

Graphic Log

N21E →

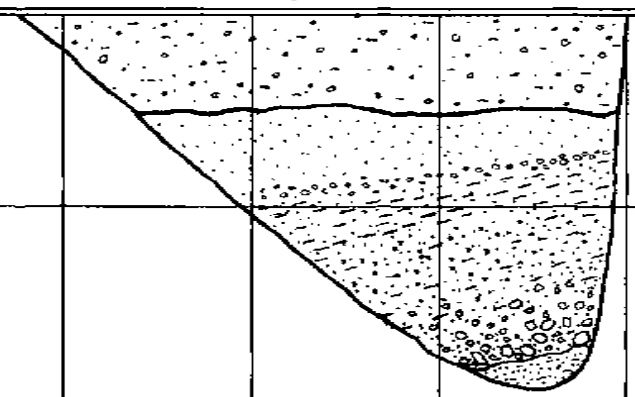


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP188

LOG OF EXCAVATION Trench No. TP189	Logged By: RMP	Date Excavated: 8/4/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Topsoil: Dark brown silty fine to coarse grained SAND with fine gravel, graded, loose, dry, friable, rootlets.	
2.5 - 3.5	Saugus Formation: Weathered to 9' (rootlets to 7.5'), yellowish brown silty fine grained SANDSTONE, poorly graded, dense, moist, weakly indurated, massive.	
3.5 - 4	6" thick subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable to weakly cemented silty fine to coarse sand matrix, well graded, very dense, moist.	
4 - 5.5	Yellowish brown fine grained sandy SILTSTONE, poorly graded, very stiff, moist, weakly indurated, massive.	
5.5 - 8.5	Grades to pale brown silty fine to medium grained SANDSTONE.	@8' B N34W/13SW
8.5 - 9	Grades to subangular to subrounded gravel to cobble CONGLOMERATE with weakly cemented silty fine to coarse sand matrix, well graded, very dense, moist.	
9 - 9.5	Yellowish brown silty fine grained SANDSTONE, poorly graded, very dense, moist, weakly indurated, massive.	
	Total Depth - 9.5' No groundwater No caving Backfilled	

Graphic Log

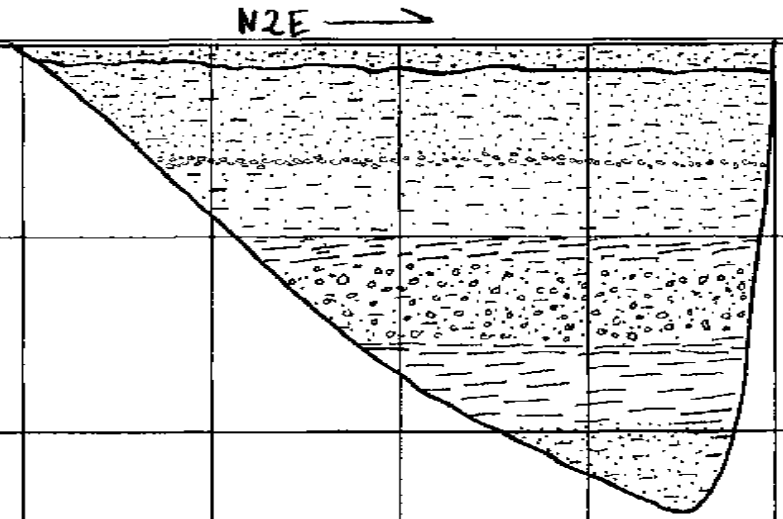


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP189

LOG OF EXCAVATION Trench No. TP190	Logged By: RMP	Date Excavated: 8/4/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark brown silty fine to coarse grained SAND with sparse fine gravel, graded, loose, dry, friable, rootlets.	
1 - 6	Saugus Formation: Weathered to 10' (rootlets to 8.5'), yellowish brown fine grained sandy SILTSTONE, poorly graded, stiff, dry, pervasively fractured and blocky, pervasive carbonate veins.	
3 - 3'3"	Grades to 3" thick subrounded fine grained gravel CONGLOMERATE with friable fine to coarse sand matrix, graded, medium dense, dry.	
6 - 6'3"	3" thick dark yellowish brown silty CLAYSTONE, poorly graded, very stiff, moist, carbonate veinlets, non-plastic, weakly indurated.	
6'3" - 8	Grades to yellowish brown subangular to subrounded fine to coarse grained gravel CONGLOMERATE with weakly cemented silty fine to coarse sand matrix, well graded, dense, moist.	@7' Approx. BN2E/4SE
8 - 10	2' thick dark yellowish brown CLAYSTONE, hard, moist, non-plastic.	
10 - 12	Grades to silty fine grained SANDSTONE with sparse fine gravel, graded, very dense, moist, weakly indurated.	
	Total Depth - 12' No groundwater No caving Backfilled	

Graphic Log

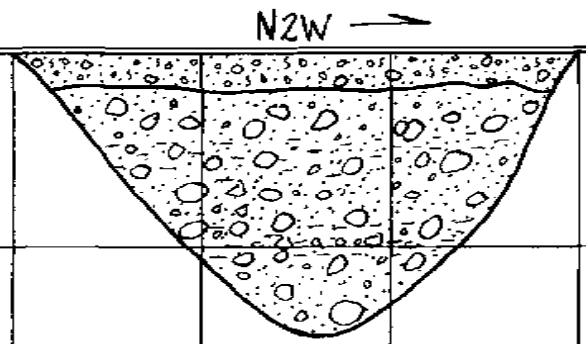


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP190

LOG OF EXCAVATION Trench No. TP191	Logged By: RMP	Date Excavated: 8/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark brown silty fine to coarse grained sandy fine GRAVEL with cobbles, well graded, loose, moist, rootlets.	
1 - 7.5	Mint Canyon Formation: Weathered to 5', rootlets to 2.5', scoured interbeds of reddish brown and olive green subangular to subrounded cobble CONGLOMERATE with trace boulders and weakly cemented silty fine to coarse sand matrix, well graded, hard, moist.	@5' B N28W/21SW
	Total Depth - 7.5' No groundwater No caving Backfilled	

Graphic Log

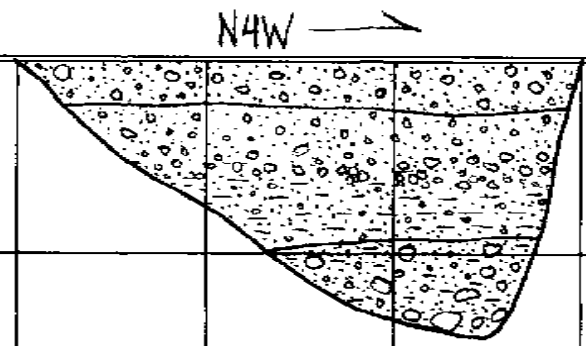


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP191

LOG OF EXCAVATION Trench No. TP192	Logged By: RMP	Date Excavated: 8/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Topsoil: Dark brown silty fine to coarse grained sandy GRAVEL with cobbles, well graded, loose, moist.	
1.5 - 2	Saugus Formation: Weathered to 4' (roots to 3'), reddish brown subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, very dense, moist.	
2 - 3	Grades to gravel to cobble CONGLOMERATE.	
3 - 4.5	Scoured contact to dark brown fine to coarse grained sandy SILTSTONE with trace fine gravel, poorly graded, hard, moist, weakly indurated, massive, blocky.	
4.5 - 7	Dark yellowish brown subangular to subrounded gravel to cobble CONGLOMERATE with weakly cemented fine to coarse sandy silt matrix, well graded, hard, matrix coarsens with depth and becomes slightly friable.	@6' B N40W/8SW
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

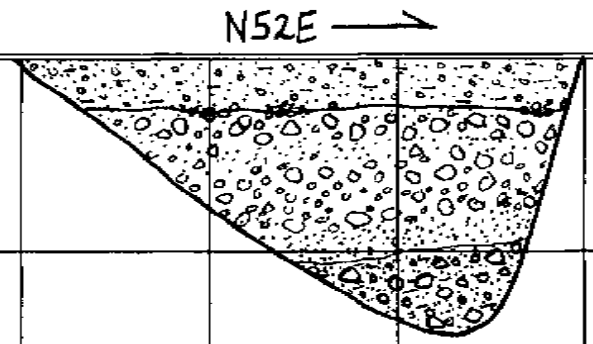


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP192

LOG OF EXCAVATION Trench No. TP193	Logged By: RMP	Date Excavated: 8/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Topsoil: Dark brown fine to coarse grained sandy silty GRAVEL, well graded, loose, dry, weakly cemented, fractured and blocky.	
1.5 - 4.5	Saugus Formation: Weathered to 5' (roots to 4'), yellowish brown subangular to subrounded gravel to cobble CONGLOMERATE with slightly friable fine to coarse sand matrix (trace silt), well graded, very dense, dry.	@4' B N24W/16SW
4.5 - 5.5	Wavy, sharp, slightly scoured contact to mottled brown and olive green trace gravelly silty fine to coarse grained SANDSTONE, poorly graded, very dense, moist, weakly cemented, massive.	
5.5 - 7	Yellow brown subangular to subrounded gravel to cobble CONGLOMERATE with slightly firable fine to coarse sand matrix (trace silt), well graded, hard, moist.	
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

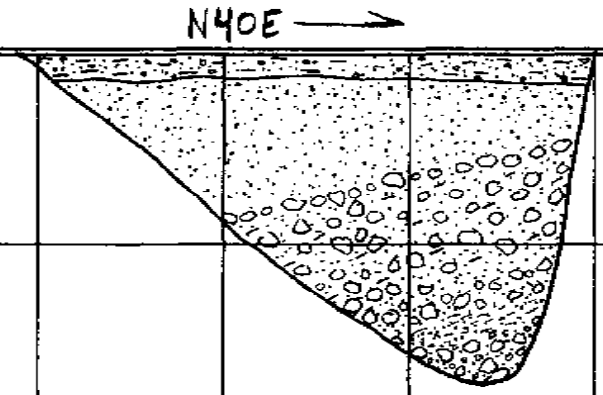


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP193

LOG OF EXCAVATION Trench No. TP194	Logged By: RMP	Date Excavated: 8/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark brown fine to coarse grained sandy SILT with fine gravel, graded, soft, dry, slightly friable.	
1 - 2.5	Saugus Formation: Weathered to 5' (roots to 3'), yellowish brown fine to coarse grained SANDSTONE, poorly graded, very dense, moist, slightly friable.	
2.5 - 7	Grades to yellowish brown subangular to subrounded cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, very dense, moist.	@6' B N44W/20SW
7 - 7.5	Wavy, sharp, scoured contact with 6" thick mottled dark brown and olive green silty fine to medium grained SANDSTONE, poorly graded, hard, moist, weakly indurated.	
7.5 - 8	Grades to yellowish brown subangular to subrounded cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist.	
	Total Depth - 8' No groundwater No caving Backfilled	

Graphic Log

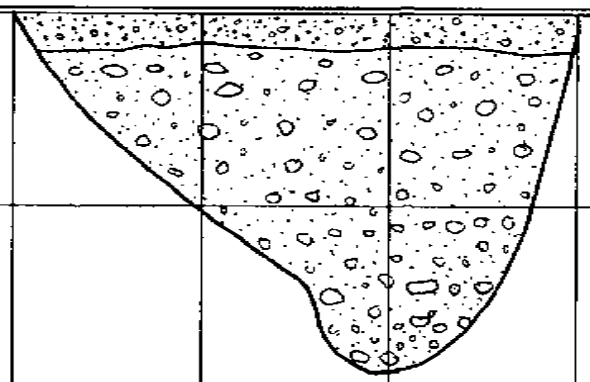


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP194

LOG OF EXCAVATION Trench No. TP195	Logged By: RMP	Date Excavated: 8/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark gray brown silty fine to coarse grained SAND with fine gravel, graded, loose, dry, weakly cemented, rootlets.	
1 - 9	Mint Canyon Formation: Weathered to 8', rootlets to 5', light yellowish brown subangular to subrounded cobble CONGLOMERATE with slightly friable matrix, well graded, very dense, moist.	@5' B N35E/18NW
	Total Depth - 9' No groundwater No caving Backfilled	

Graphic Log



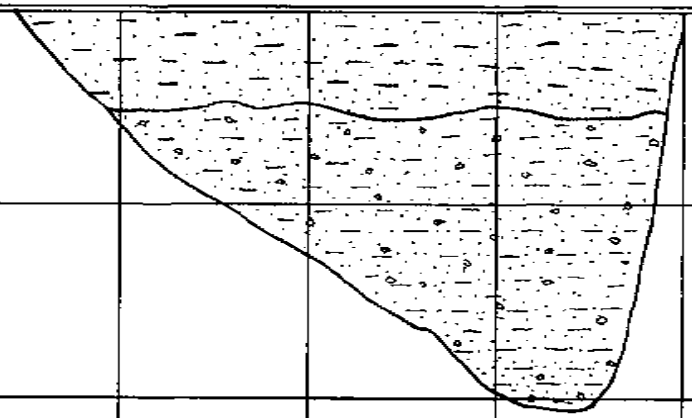
scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP195

LOG OF EXCAVATION Trench No. TP196	Logged By: RMP	Date Excavated: 8/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Topsoil: Dark brown fine to coarse grained sandy SILT, graded, loose to medium dense, moist, slightly friable.	
2.5 - 9	Mint Canyon Formation: Weathered to 9' (roots to 8'), yellowish brown fine grained sandy SILTSTONE, poorly graded, very stiff, moist, weakly indurated, white carbonate veinlets, occasional subangular fine gravel, massive.	
9 - 10	Hard.	
	Total Depth - 10' No groundwater No caving Backfilled	

Graphic Log

N26E →

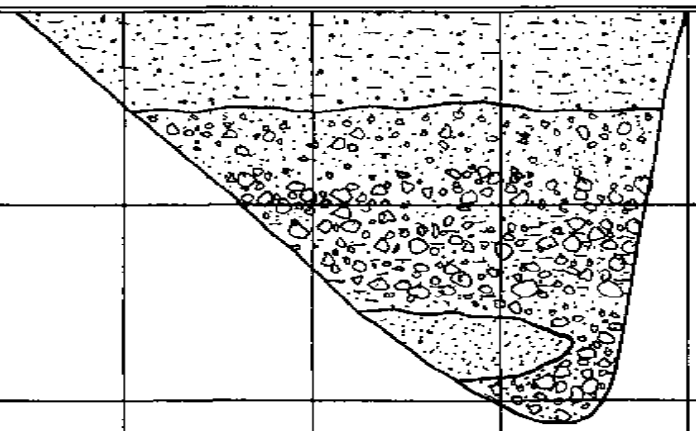


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP196

LOG OF EXCAVATION Trench No. TP197	Logged By: RMP	Date Excavated: 8/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Topsoil: Dark brown fine to coarse grained sandy SILT with fine gravel, graded, stiff, moist, weakly cemented.	
2.5 - 5.5	Mint Canyon Formation: Weathered to 8.5' (roots to 5', carbonate veins), pale yellowish brown subangular to subrounded fine grained gravel CONGLOMERATE with slightly friable with silty fine to coarse sand matrix, well graded, medium dense, moist.	
5.5 - 7.5	Grades to subangular to subrounded gravel to cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, dense, moist.	
7.5 - 9.5	Scoured, irregular contact with discontinuous pale brown silty fine to coarse grained SANDSTONE, poorly graded, hard, moist, slightly friable, massive, white carbonate veins.	@8' Approx. BN57W/19SW
9.5 - 10.5	Grades to subangular to subrounded cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist.	
	Total Depth - 10.5' No groundwater No caving Backfilled	

Graphic Log

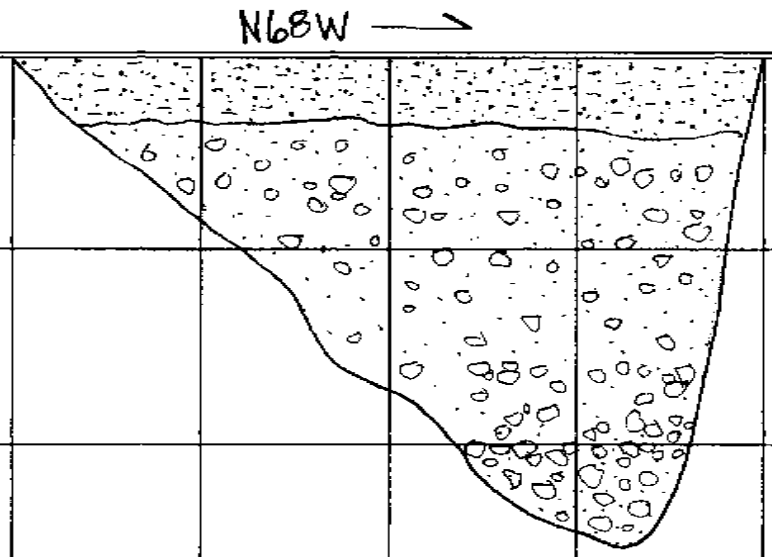


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP197

LOG OF EXCAVATION Trench No. TP198	Logged By: RMP	Date Excavated: 8/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Topsoil: Dark brown fine to coarse grained sandy SILT with fine gravel, graded, soft, moist, rootlets.	
2 - 12	Mint Canyon Formation: Weathered to 8', roots to 4', light yellowish brown subangular to subrounded cobble CONGLOMERATE with slightly friable matrix, well graded, dense, moist, trace boulders.	@7' Approx. BN5W/15SW
@8'	Grades to very dense.	
	Total Depth - 12' No groundwater No caving Backfilled	

Graphic Log

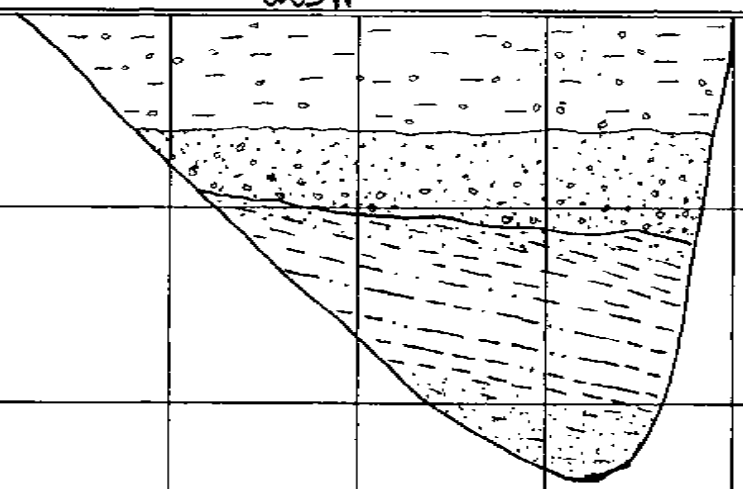


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP198

LOG OF EXCAVATION Trench No. TP199	Logged By: RMP	Date Excavated: 8/7/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Topsoil: Dark brown fine to coarse grained sandy SILT with fine gravel, graded, very stiff, moist, rootlets.	
3 - 5.5	Saugus Formation: Weathered to 9' (roots to 5'), yellowish brown silty fine grained SANDSTONE, poorly graded, dense, moist, weakly indurated, massive.	
5.5 - 6	Grades to yellowish brown fine to coarse grained SANDSTONE with fine gravel, graded, dense, moist, slightly friable.	@5.5' B N81E/13SE
6 - 8	Wavy, scoured contact with yellowish brown fine grained sandy SILTSTONE, poorly graded, very stiff, moist, slightly friable, massive, white carbonate veins.	
8 - 8.5	6" thick dark yellowish brown clayey SILTSTONE, poorly graded, hard, moist, weakly indurated, massive.	
8.5 - 11	Grades to yellowish brown SILTSTONE.	
11 - 11.5	Grades to yellowish brown silty fine grained SANDSTONE, poorly graded, hard, moist, weakly indurated.	
	Total Depth - 11.5' No groundwater No caving Backfilled	

Graphic Log

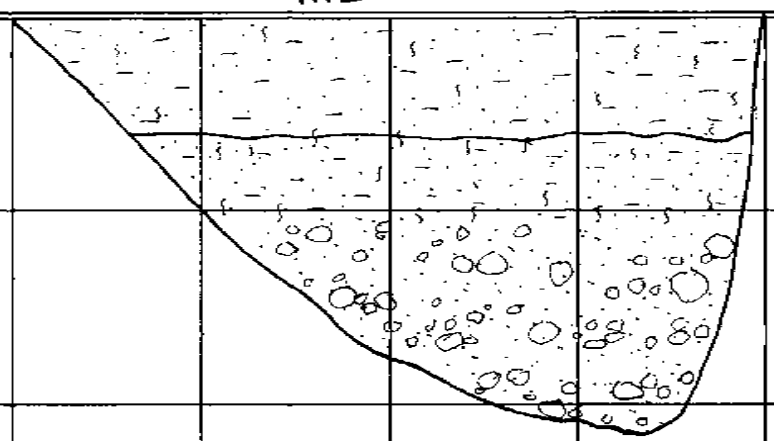


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP199

LOG OF EXCAVATION Trench No. TP200	Logged By: RMP	Date Excavated: 8/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Topsoil: Dark brown clayey fine to coarse grained sandy SILT, graded, very stiff, moist, blocky and pervasively fractured, rootlets.	
3 - 6	Terrace Deposits: Weathered to 6' (rootlets), yellow brown silty fine grained SAND, poorly graded, dense, moist, consolidated, pervasive carbonate veins.	
6 - 11	Grades to yellow brown cobble to boulder GRAVEL with slightly friable fine to coarse sand matrix, well graded, very dense, moist, subrounded to rounded, 10% boulders.	@7' Approx. BN43E/10SE
	Total Depth - 11' No groundwater No caving Backfilled	

Graphic Log

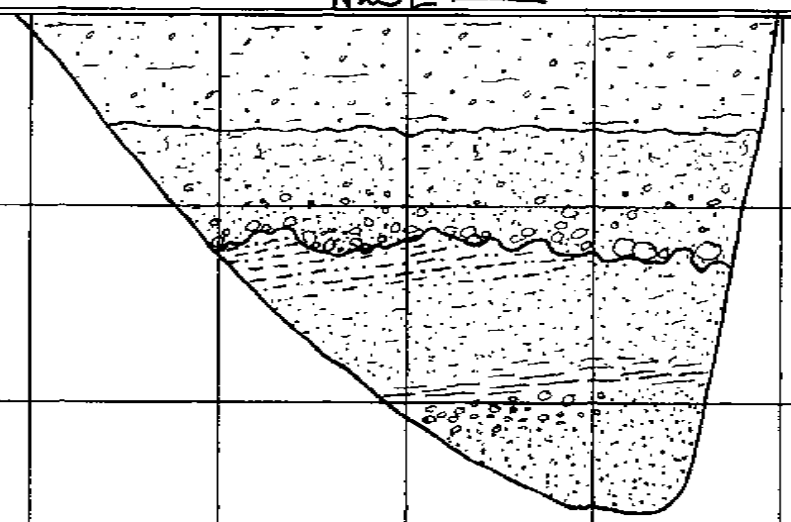


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP200

LOG OF EXCAVATION Trench No. TP201	Logged By: RMP	Date Excavated: 8/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Topsoil: Dark brown clayey silty fine to coarse grained SAND with fine gravel, graded, dense, moist, rootlets.	
3 - 4	Terrace Deposits: Yellowish brown silty fine to coarse grained SAND, poorly graded, very dense, moist, consolidated, roots.	
4 - 6	Grades to yellowish brown subangular to subrounded fine to coarse grained gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, very dense, moist.	
6 - 6.5	Saugus Formation: Weathered to 9.5', irregular scoured contact with yellowish brown fine grained sandy SILTSTONE, poorly graded, very dense, moist, slightly friable.	
6.5 - 9	Grades to silty fine to medium grained SANDSTONE.	
9 - 9.5	Gradational contact with 6" thick dark yellowish brown CLAYSTONE, very stiff, moist, weakly indurated, medium plastic, pervasive internal shearing truncated above and below by sandstone beds, discontinuous (scoured out by conglomerate on east wall), sharp, irregular, sheared contact with material below.	@10' B N6E/19NW
9.5 - 10.5	Channel Deposit: Yellow brown subangular to subrounded gravel CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, very dense, moist.	Total Depth - 12.5' No groundwater No caving Backfilled
10.5 - 12.5	Yellowish brown fine to coarse grained SANDSTONE, poorly graded, very dense, moist, slightly friable, massive.	

Graphic Log

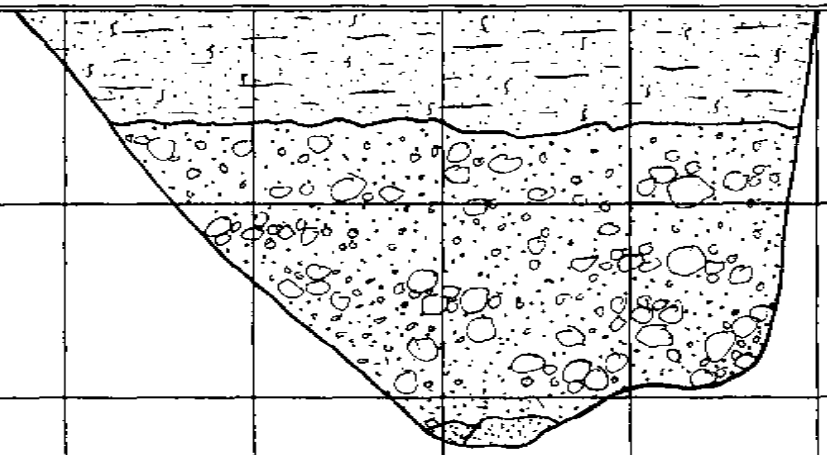


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP201

LOG OF EXCAVATION Trench No. TP202	Logged By: RMP	Date Excavated: 8/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 3	Topsoil: Dark brown fine to coarse grained sandy silty CLAY with fine gravel, graded, very dense, moist, rootlets.	
3 - 11	Terrace Deposits: Pale brown cobble to boulder GRAVEL with slightly friable fine to coarse sand matrix, well graded, very dense, moist.	
11 - 11.5	Saugus Formation: Weathered to 11.5', yellowish brown fine to coarse grained SANDSTONE, poorly graded, very dense, moist, slightly friable.	
	Total Depth - 11.5' No groundwater No caving Backfilled	

Graphic Log

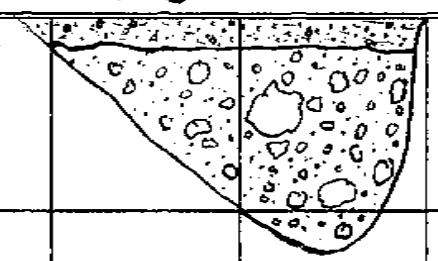


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP202

LOG OF EXCAVATION Trench No. TP203	Logged By: RMP	Date Excavated: 8/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark brown clayey silty fine to coarse grained SAND with fine gravel, graded, very dense, moist.	
1 - 6	Saugus Formation: Weathered to 4.5' (roots to 4'), yellow brown subangular to subrounded gravel to cobble CONGLOMERATE with slightly friable matrix, well graded, very dense, moist, trace boulders (2' diameter in east wall).	@3' Approx. BN85W/14SW
	Total Depth - 6' No groundwater No caving Backfilled	

Graphic Log

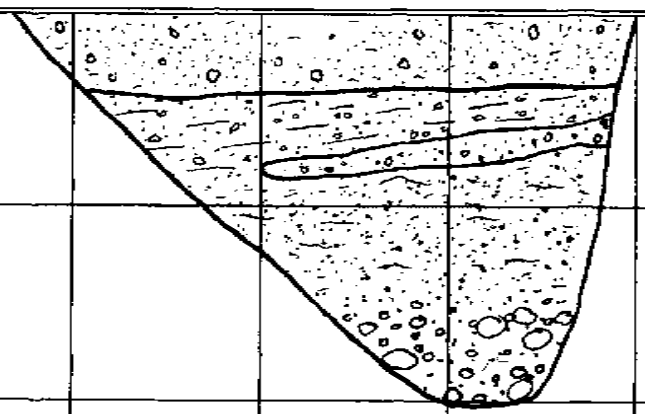


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP203

LOG OF EXCAVATION Trench No. TP204	Logged By: RMP	Date Excavated: 8/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Topsoil: Dark grayish brown silty fine to coarse grained SAND with fine to coarse gravel, graded, dense, dry, slightly friable, rootlets.	
2 - 3	Saugus Formation: Weathered to 8' (roots to 5'), brown fine grained sandy CLAYSTONE with subangular fine gravel, graded, very stiff, moist, weakly indurated.	
3 - 4	1' thick discontinuous channeled sand, yellowish brown silty fine to coarse grained SANDSTONE with subangular fine gravel, graded, very dense, moist, massive, slightly friable.	@3' CH N39E/25SE
4 - 4.5	Dark yellowish brown clayey silty fine to coarse grained SANDSTONE, graded, very dense, moist, weakly indurated.	
4.5 - 7	Yellowish brown silty fine to coarse grained SANDSTONE, poorly graded, very dense, moist, weakly indurated, massive, pervasive subhorizontal carbonate veins.	
7 - 10	Yellowish brown subangular to subrounded gravel to cobble CONGLOMERATE with slightly friable silty fine to coarse sand matrix, well graded, hard, moist.	
	Total Depth - 10' No groundwater No caving Backfilled	

Graphic Log

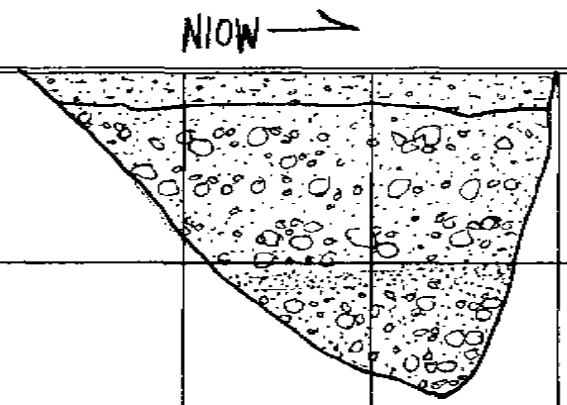


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP204

LOG OF EXCAVATION Trench No. TP205	Logged By: RMP	Date Excavated: 8/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1	Topsoil: Dark grayish brown silty fine to coarse grained SAND with fine gravel, graded, dense, dry, rootlets, slightly friable.	
1 - 8	Saugus Formation: Weathered to 6' (rootlets to 3'), yellowish brown subangular to subrounded gravel to cobble CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, very dense, moist.	@6' B N64W/17SW
@6'	1' thick fine to coarse grained SANDSTONE layer.	
	Total Depth - 8' No groundwater No caving Backfilled	

Graphic Log

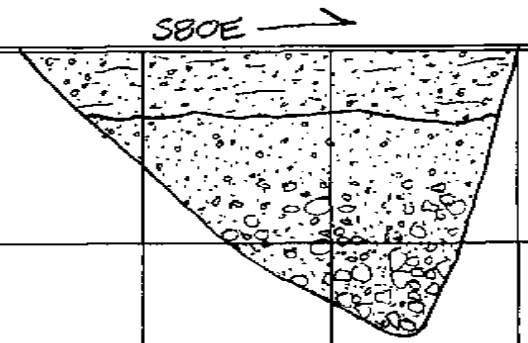


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP205

LOG OF EXCAVATION Trench No. TP206	Logged By: RMP	Date Excavated: 8/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2	Topsoil: Yellow brown clayey silty fine to coarse grained sandy fine GRAVEL, well graded, very dense, moist, rootlets.	
2 - 7	Saugus Formation: Weathered to 6' (roots to 3'), Yellow brown gravelly SANDSTONE, grading to gravel to cobble CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, very dense, moist.	@5' Approx. BN13W/17SW
	Total Depth - 7' No groundwater No caving Backfilled	

Graphic Log

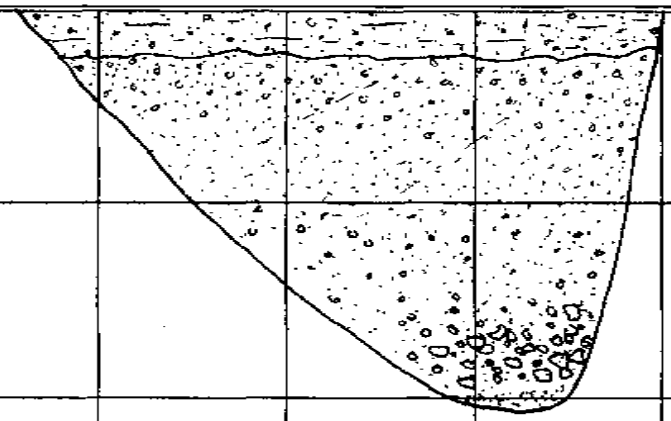


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP206

LOG OF EXCAVATION Trench No. TP207	Logged By: RMP	Date Excavated: 8/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 1.5	Topsoil: Brown clayey silty fine to coarse grained SAND with fine gravel, graded, very dense, moist.	
1.5 - 3.5	Saugus Formation: Weathered to 8' (roots to 4', matrix tighter at 8' with more fines), yellowish brown subangular to subrounded fine to coarse grained gravel CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, very dense, moist.	
3.5 - 6	Bedding subparallel carbonate veins.	
5.5 - 8.5	Yellowish brown fine to coarse grained SANDSTONE with fine gravel, graded, very dense, moist, slightly friable, massive.	
8.5 - 9.5	Grades to subangular to subrounded gravel to cobble CONGLOMERATE with slightly friable fine to coarse sand matrix, well graded, hard, moist.	@9' B N35W/8SW
9.5 - 10	Yellowish brown fine to coarse grained SANDSTONE with fine gravel, graded, hard, moist, slightly friable, massive.	
	Total Depth - 10' No groundwater No caving Backfilled	

Graphic Log

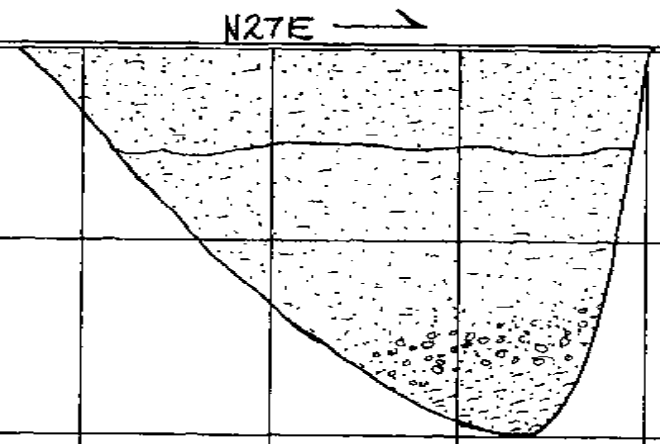


scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP207

LOG OF EXCAVATION Trench No. TP208	Logged By: RMP	Date Excavated: 8/8/06	Client: Pardee Homes

Depth (ft)	Description	Comments
0 - 2.5	Topsoil: Brown silty fine to coarse grained SAND, poorly graded, very dense, moist, rootlets.	
2.5 - 5	Saugus Formation: Weathered to 9.5' (roots to 8'), yellowish brown silty fine grained SANDSTONE, poorly graded, very dense, moist, moderately indurated, pervasively fractured and blocky with white carbonate staining in fractures.	
5 - 7.5	Yellowish brown silty fine grained SANDSTONE with sparse fine gravel, poorly graded, very dense, moist, weakly indurated, massive.	
7.5 - 8.5	Grades to yellowish brown subangular to subrounded fine to coarse grained gravel CONGLOMERATE with slightly friable silty fine sand matrix, graded, very dense, moist.	@8' B N52W/14SW
8.5 - 10	Dark yellowish brown fine to medium grained sandy SILTSTONE, poorly graded, very dense, moist, weakly indurated, massive.	
	Total Depth - 10' No groundwater No caving Backfilled	

Graphic Log



scale 1" = 5'	GEOLABS-WESTLAKE VILLAGE	W.O. 8838	PLATE TP208

APPENDIX C

SLOPE STABILITY ANALYSES

TTM 060922, SKYLINE RANCH
COUNTY OF LOS ANGELES, CALIFORNIA

W.O. 8838
Sec. B-B' W=100' D=5'

XSTABL File: 8838B 11-20-** 10:15

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 À 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*         All Rights Reserved           *
*                                       *
*  Ver. 5.201                96 À 1545  *
*****************************************
```

Problem Description : Sec. B-B' W=100'D=5'

SEGMENT BOUNDARY COORDINATES
---

9 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1823.0	124.0	1835.0	1
2	124.0	1835.0	210.0	1835.0	1
3	210.0	1835.0	610.0	2005.0	2
4	610.0	2005.0	640.0	2000.0	2
5	640.0	2000.0	780.0	2000.0	1
6	780.0	2000.0	890.0	1950.0	3
7	890.0	1950.0	1020.0	1885.0	3
8	1020.0	1885.0	1120.0	1860.0	4
9	1120.0	1860.0	1200.0	1840.0	4

5 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	210.0	1835.0	210.1	1830.0	1
2	210.1	1830.0	310.0	1830.0	1
3	310.0	1830.0	640.0	2000.0	1
4	.0	1720.0	890.0	1950.0	3
5	.0	1625.0	1020.0	1885.0	4

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

---
ISOTROPIC Soil Parameters
---

4 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0
4	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 3 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	14.00	100.0	25.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	14.00	150.0	17.00
3	90.00	225.0	40.00

Soil Unit 4 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	14.00	150.0	11.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces

W.O. 8838
Sec. B-B' W=100' D=5'

are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	210.0	1790.0	500.0	1860.0	70.0
2	540.0	1870.0	810.0	1940.0	70.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	137.25	1835.00
2	156.36	1826.09
3	246.99	1783.83
4	247.49	1783.59
5	603.82	1868.12
6	608.02	1877.13
7	650.29	1967.76
8	661.59	1992.00
9	661.59	2000.00

** Corrected JANBU FOS = 1.713 ** (Fo factor = 1.071)

Failure surface No. 2 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	163.00	1835.00
2	172.93	1830.37
3	263.56	1788.11
4	264.99	1787.44
5	749.62	1908.01
6	752.65	1914.50
7	787.25	1988.71
8	787.25	1996.71

** Corrected JANBU FOS = 1.727 ** (Fo factor = 1.049)

Failure surface No. 3 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	166.74	1835.00
2	175.33	1830.99
3	265.97	1788.73
4	272.91	1785.50
5	607.49	1867.43
6	612.56	1878.30
7	654.82	1968.93
8	665.58	1992.00
9	665.58	2000.00

** Corrected JANBU FOS = 1.731 ** (Fo factor = 1.073)

Failure surface No. 4 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	142.41	1835.00
2	159.68	1826.95
3	250.31	1784.69
4	252.48	1783.67
5	590.47	1858.87
6	597.75	1874.47
7	640.01	1965.11
8	652.55	1992.00
9	652.55	2000.00

** Corrected JANBU FOS = 1.742 ** (Fo factor = 1.075)

Failure surface No. 5 specified by 10 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	173.94	1835.00
2	179.97	1832.19
3	270.60	1789.93
4	273.23	1788.70
5	556.29	1851.71
6	562.68	1865.41
7	604.95	1956.04
8	620.84	1990.13
9	623.31	1994.78
10	623.31	2002.78

** Corrected JANBU FOS = 1.748 ** (Fo factor = 1.081)

Failure surface No. 6 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	150.53	1835.00
2	164.90	1828.30
3	255.53	1786.04
4	255.65	1785.98
5	689.42	1887.62
6	695.01	1899.61
7	737.28	1990.24
8	738.10	1992.00
9	738.10	2000.00

** Corrected JANBU FOS = 1.752 ** (Fo factor = 1.061)

Failure surface No. 7 specified by 9 coordinate points

W.O. 8838
Sec. B-B' W=100' D=5'

Point No.	x-surf (ft)	y-surf (ft)
1	188.44	1835.00
2	189.29	1834.60
3	279.93	1792.34
4	288.82	1788.19
5	568.81	1857.94
6	573.61	1868.24
7	615.87	1958.87
8	631.95	1993.34
9	631.95	2001.34

** Corrected JANBU FOS = 1.754 ** (Fo factor = 1.079)

Failure surface No. 8 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	157.41	1835.00
2	169.33	1829.44
3	259.96	1787.18
4	262.31	1786.08
5	581.62	1851.95
6	591.36	1872.82
7	633.62	1963.45
8	646.93	1992.00
9	646.93	2000.00

** Corrected JANBU FOS = 1.764 ** (Fo factor = 1.078)

Failure surface No. 9 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	162.69	1835.00
2	172.72	1830.32
3	263.35	1788.06
4	271.32	1784.34
5	693.02	1888.06
6	698.87	1900.61
7	741.13	1991.24
8	741.49	1992.00
9	741.49	2000.00

** Corrected JANBU FOS = 1.770 ** (Fo factor = 1.061)

Failure surface No.10 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	160.05	1835.00
2	171.03	1829.88
3	261.66	1787.62
4	266.82	1785.21
5	637.32	1870.00
6	645.11	1886.71
7	687.38	1977.35
8	694.21	1992.00
9	694.21	2000.00

** Corrected JANBU FOS = 1.775 ** (Fo factor = 1.070)

The following is a summary of the TEN most critical surfaces

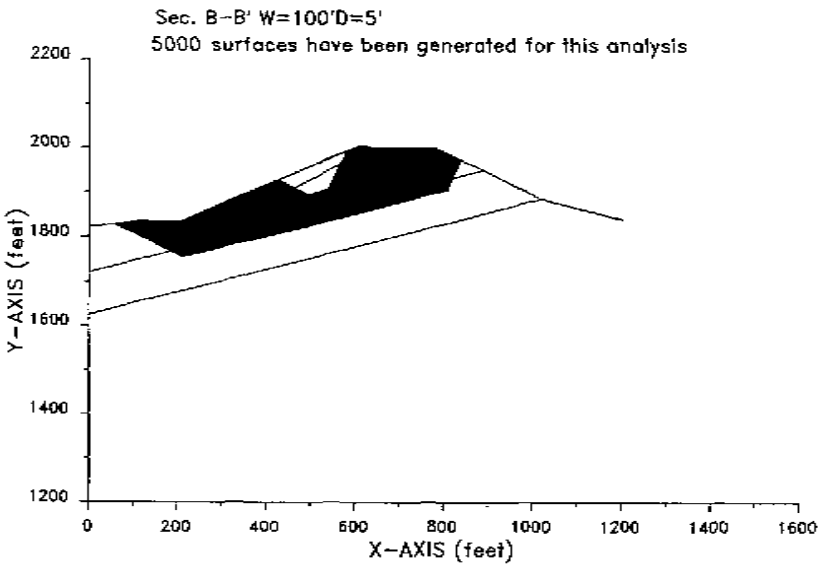
Problem Description : Sec. B-B' W=100'D=5'

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.713	1.071	137.25	661.59	2.485E+06
2.	1.727	1.049	163.00	787.25	2.782E+06
3.	1.731	1.073	166.74	665.58	2.524E+06
4.	1.742	1.075	142.41	652.55	2.532E+06
5.	1.749	1.081	173.94	623.31	2.277E+06
6.	1.752	1.061	150.53	738.10	2.724E+06
7.	1.754	1.079	188.44	631.95	2.355E+06
8.	1.764	1.078	157.41	646.93	2.525E+06
9.	1.770	1.061	162.69	741.49	2.824E+06
10.	1.775	1.070	160.05	694.21	2.682E+06

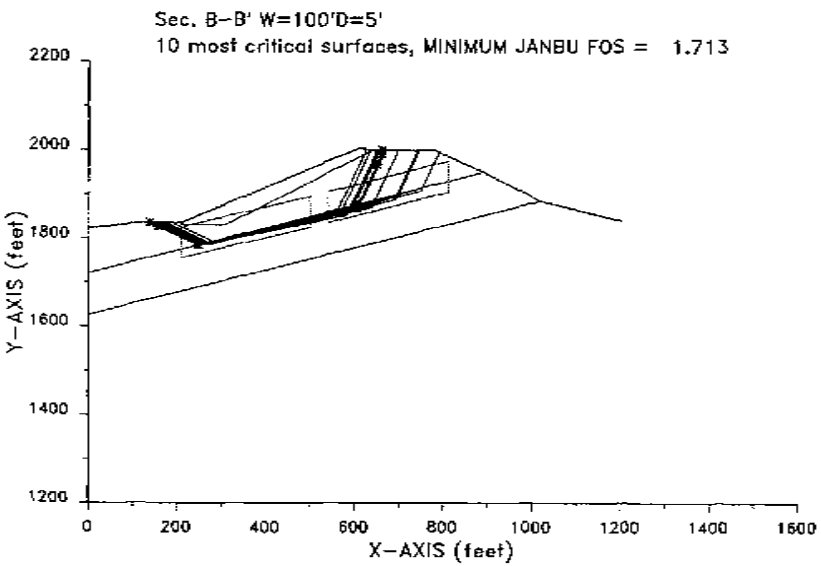
* * * END OF FILE * * *

W.O. 8838
Sec. B-B' W=100' D=5'

8838B 11-20-94 10:15



8838B 11-20-94 10:15



W.O. 8838
Sec. B-B' Pseudo

XSTABL File: 8838BP 11-20-** 10:15

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*         Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Â 1545  *
*****************************************
```

Problem Description : Sec. B-B' W=100'D=5' Pseudo

SEGMENT BOUNDARY COORDINATES

9 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1823.0	124.0	1835.0	1
2	124.0	1835.0	210.0	1835.0	1
3	210.0	1835.0	610.0	2005.0	2
4	610.0	2005.0	640.0	2000.0	2
5	640.0	2000.0	780.0	2000.0	1
6	780.0	2000.0	890.0	1950.0	3
7	890.0	1950.0	1020.0	1885.0	3
8	1020.0	1885.0	1120.0	1860.0	4
9	1120.0	1860.0	1200.0	1840.0	4

5 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	210.0	1835.0	210.1	1830.0	1
2	210.1	1830.0	310.0	1830.0	1
3	310.0	1830.0	640.0	2000.0	1
4	.0	1720.0	890.0	1950.0	3
5	.0	1625.0	1020.0	1885.0	4

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

4 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0
4	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 3 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	14.00	100.0	25.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	14.00	150.0	17.00
3	90.00	225.0	40.00

Soil Unit 4 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	14.00	150.0	11.00
3	90.00	225.0	40.00

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	210.0	1790.0	500.0	1860.0	70.0
2	540.0	1870.0	810.0	1940.0	70.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	163.00	1835.00
2	172.93	1830.37
3	263.56	1788.11
4	264.99	1787.44
5	749.62	1908.01
6	752.65	1914.50
7	787.25	1988.71
8	787.25	1996.71

** Corrected JANBU FOS = 1.097 ** (Fo factor = 1.049)

Failure surface No. 2 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	156.30	1835.00
2	168.27	1829.42
3	258.90	1787.16
4	779.45	1910.58
5	785.20	1922.92
6	810.87	1977.97
7	810.87	1985.97

** Corrected JANBU FOS = 1.108 ** (Fo factor = 1.044)

Failure surface No. 3 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	161.47	1835.00
2	171.94	1830.12
3	262.57	1787.85
4	263.89	1787.24
5	766.10	1901.32
6	774.93	1920.26
7	803.42	1981.36
8	803.42	1989.36

** Corrected JANBU FOS = 1.122 ** (Fo factor = 1.049)

Failure surface No. 4 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	206.79	1835.00
2	210.03	1833.28
3	216.20	1830.00
4	290.89	1795.17
5	293.98	1793.73
6	792.12	1914.55
7	797.50	1926.09
8	819.79	1973.91
9	819.79	1981.91

** Corrected JANBU FOS = 1.126 ** (Fo factor = 1.042)

Failure surface No. 5 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	150.53	1835.00
2	164.90	1828.30
3	255.53	1786.04
4	255.65	1785.98
5	689.42	1887.62
6	695.01	1899.61
7	737.28	1990.24
8	738.10	1992.00
9	738.10	2000.00

** Corrected JANBU FOS = 1.127 ** (Fo factor = 1.061)

Failure surface No. 6 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	190.18	1835.00
2	279.57	1793.32
3	754.19	1909.21
4	757.21	1915.68
5	790.56	1987.20
6	790.56	1995.20

** Corrected JANBU FOS = 1.132 ** (Fo factor = 1.049)

Failure surface No. 7 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	120.10	1834.62
2	144.80	1823.10
3	235.43	1780.84
4	239.48	1778.95
5	770.37	1907.04
6	776.76	1920.74
7	804.75	1980.75
8	804.75	1988.75

** Corrected JANBU FOS = 1.135 ** (Fo factor = 1.048)

Failure surface No. 8 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	157.11	1835.00
2	167.09	1830.34
3	257.72	1788.08
4	804.85	1909.69
5	814.56	1930.50
6	832.18	1968.28
7	832.18	1976.28

** Corrected JANBU FOS = 1.139 ** (Fo factor = 1.042)

Failure surface No. 9 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	176.46	1835.00
2	181.59	1832.61
3	272.22	1790.35
4	273.72	1789.65
5	757.25	1894.40
6	768.54	1918.61
7	798.78	1983.46
8	798.78	1991.46

** Corrected JANBU FOS = 1.141 ** (Fo factor = 1.053)

Failure surface No.10 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	217.85	1838.34
2	233.54	1830.00
3	302.04	1798.06
4	303.73	1797.27
5	792.19	1913.43
6	798.18	1926.27
7	820.29	1973.69
8	820.29	1981.69

** Corrected JANBU FOS = 1.142 ** (Fo factor = 1.042)

The following is a summary of the TEN most critical surfaces

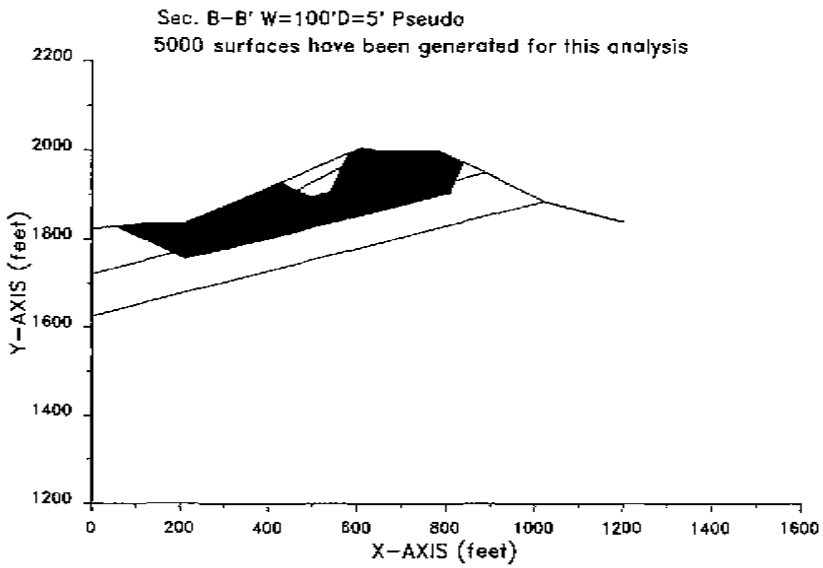
Problem Description : Sec. B-B' W=100'D=5' Pseudo

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.097	1.049	163.00	787.25	2.787E+06
2.	1.108	1.044	156.30	810.87	2.900E+06
3.	1.122	1.049	161.47	803.42	2.963E+06
4.	1.126	1.042	206.79	819.79	2.855E+06
5.	1.127	1.061	150.53	738.10	2.704E+06
6.	1.132	1.049	190.18	790.56	2.789E+06
7.	1.135	1.048	120.10	804.75	3.099E+05
8.	1.139	1.042	157.11	832.18	3.023E+06
9.	1.141	1.053	176.46	798.78	2.980E+06
10.	1.142	1.042	217.85	820.29	2.828E+06

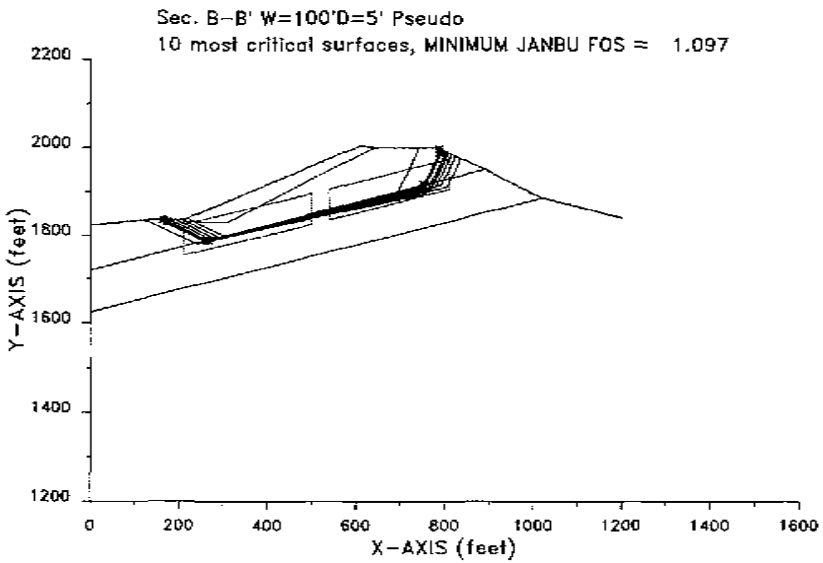
* * * END OF FILE * * *

W.O. 8838
Sec. B-B' Pseudo

88388P 11-20-** 10:15



88388P 11-20-** 10:15



W.O. 8838

Sec. B-B' Pseudo., Spencer's

XSTABL File: 8838BPS 11-20-** 10:16

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Â 1545  *
*****************************************
```

Problem Description : Sec. B-B' W=100'D=5' Pseudo Spencer

SEGMENT BOUNDARY COORDINATES

9 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1823.0	124.0	1835.0	1
2	124.0	1835.0	210.0	1835.0	1
3	210.0	1835.0	610.0	2005.0	2
4	610.0	2005.0	640.0	2000.0	2
5	640.0	2000.0	780.0	2000.0	1
6	780.0	2000.0	890.0	1950.0	3
7	890.0	1950.0	1020.0	1885.0	3
8	1020.0	1885.0	1120.0	1860.0	4
9	1120.0	1860.0	1200.0	1840.0	4

5 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	210.0	1835.0	210.1	1830.0	1
2	210.1	1830.0	310.0	1830.0	1
3	310.0	1830.0	640.0	2000.0	1
4	.0	1720.0	890.0	1950.0	3
5	.0	1623.0	1020.0	1885.0	4

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

4 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0
4	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS specified for 3 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	14.00	100.0	25.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	14.00	150.0	17.00
3	90.00	225.0	40.00

Soil Unit 4 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	14.00	150.0	11.00
3	90.00	225.0	40.00

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

W.O. 8838
Sec. B-B' Pseudo., Spencer's

A SINGLE FAILURE SURFACE HAS BEEN SPECIFIED FOR ANALYSIS

Trial failure surface specified by
the following 8 coordinate points :

Point No.	x-surf (ft)	y-surf (ft)
1	163.00	1835.00
2	172.93	1830.37
3	263.56	1788.11
4	264.99	1787.44
5	749.62	1908.01
6	752.65	1914.50
7	787.25	1988.71
8	787.25	1996.71

****
SELECTED METHOD OF ANALYSIS: Spencer (1973)
****

****
SUMMARY OF INDIVIDUAL SLICE INFORMATION
****

Slice	x-base (ft)	y-base (ft)	height (ft)	width (ft)	alpha	beta	weight (lb)
1	167.96	1832.69	2.31	9.93	-25.00	.00	2988.
2	191.46	1821.73	13.27	37.07	-25.00	.00	63963.
3	210.05	1813.06	21.96	.10	-25.00	23.03	284.
4	236.83	1800.57	45.83	53.46	-25.00	23.03	314116.
5	264.27	1787.77	70.29	1.43	-25.11	23.03	12867.
6	287.49	1793.04	74.90	45.01	13.97	23.03	429705.
7	460.00	1835.96	105.29	300.00	13.97	23.03	4055498.
8	625.00	1877.01	125.49	30.00	13.97	-9.46	487892.
9	694.81	1894.37	105.63	109.62	13.97	.00	1505235.
10	751.14	1911.26	88.74	3.03	64.97	.00	34987.
11	766.33	1943.83	56.17	27.35	65.00	.00	199692.
12	783.62	1980.93	17.42	7.25	65.00	-24.44	16414.

ITERATIONS FOR SPENCER'S METHOD

Iter #	Theta	FOS_force	FOS_moment
2	18.5368	1.3433	1.2528
3	17.6622	-----	1.3433
3	18.0995	1.3325	-----
4	17.7540	1.3241	1.3325
5	17.8272	-----	1.3241
5	17.7906	1.3251	-----
6	17.8183	1.3257	1.3251

SLICE INFORMATION ... continued :

Slice	Sigma (psf)	c-value (psf)	phi	U-base (lb)	U-top (lb)	P-top (lb)	Delta
1	1194.9	225.0	40.00	0.	0.	0.	.00
2	5051.6	225.0	40.00	0.	0.	0.	.00
3	8075.0	225.0	40.00	0.	0.	0.	.00
4	16287.8	225.0	40.00	0.	0.	0.	.00
5	24894.5	225.0	40.00	0.	0.	0.	.00
6	8554.1	150.0	17.00	0.	0.	0.	.00
7	12109.3	150.0	17.00	0.	0.	0.	.00
8	14566.4	150.0	17.00	0.	0.	0.	.00
9	12300.0	150.0	17.00	0.	0.	0.	.00
10	3756.6	225.0	40.00	0.	0.	0.	.00
11	2335.3	225.0	40.00	0.	0.	0.	.00
12	653.1	225.0	40.00	0.	0.	0.	.00

SPENCER'S (1973) - TOTAL Stresses at center of slice base

Slice #	Base x-coord (ft)	Normal Stress (psf)	Vertical Stress (psf)	Pore Water Pressure (psf)	Shear Stress (psf)
1	167.96	1194.9	300.9	.0	925.0
2	191.46	5051.6	1725.5	.0	3367.1
3	210.05	8075.0	2842.2	.0	5280.7
4	236.83	16287.8	5875.7	.0	10478.8
5	264.27	24894.5	8997.6	.0	15926.3
6	287.49	8554.1	9546.9	.0	2085.8
7	460.00	12109.3	13518.3	.0	2905.7
8	625.00	14566.4	16263.1	.0	3472.3
9	694.81	12300.0	13731.4	.0	2949.7
10	751.14	3756.6	11536.5	.0	2547.4
11	766.33	2335.3	7301.7	.0	1647.8
12	783.62	653.1	2264.6	.0	583.1

SPENCER'S (1973) - Magnitude & Location of Interslice Forces

Slice #	Right x-coord (ft)	Force Angle (degrees)	Interslice Force (lb)	Force Height (ft)	Boundary Height (ft)	Height Ratio
1	172.93	17.82	14999.	3.87	4.63	.837
2	210.00	17.82	227747.	15.52	21.92	.708
3	210.10	17.82	228653.	15.54	22.00	.706
4	263.56	17.82	1194063.	27.12	69.65	.389
5	264.99	17.82	1233479.	27.31	70.93	.385
6	310.00	17.82	1163775.	30.15	78.86	.382
7	610.00	17.82	491103.	40.19	131.73	.305
8	640.00	17.82	409453.	38.85	119.26	.326
9	749.62	17.82	159580.	35.32	91.99	.384
10	752.65	17.82	136550.	33.50	85.49	.392
11	780.00	17.82	8547.	8.90	26.84	.332
12	787.25	.00	-252.	-.07	8.00	-.008

AVERAGE VALUES ALONG FAILURE SURFACE

Total Normal Stress = 10542.42 (psf)
Pore Water Pressure = .00 (psf)
Shear Stress = 3369.86 (psf)

Total Length of failure surface = 700.97 feet

For the single specified surface and the assumed angle

W.O. 8838

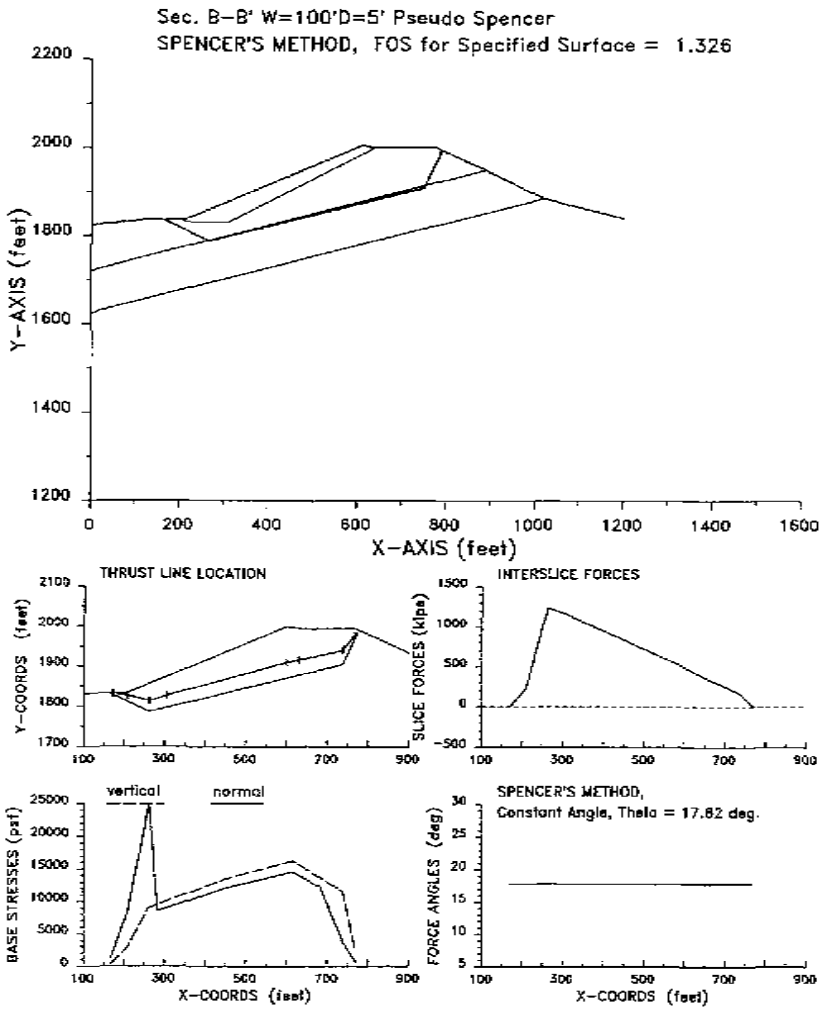
Sec. B-B' Pseudo., Spencer's

```
of the interslice forces, the SPENCER'S (1973)
procedure gives a

        FACTOR OF SAFETY =   1.326

Total shear strength available
along specified failure surface =  313.16E+04   lb

8838BPS  11-20-**  10:16
```



Sec. B-B' W=100'D=5' Pseudo Spencer
SPENCER'S METHOD, FOS for Specified Surface = 1.326

W.O. 8838
Sec. B-B' Backcut

XSTABL File: 8838BB 11-20-** 10:08

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 Â 1545   *
*****************************************
```

Problem Description : Sec. B-B' Backcut

SEGMENT BOUNDARY COORDINATES

10 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1823.0	124.0	1835.0	1
2	124.0	1835.0	210.0	1835.0	1
3	210.0	1835.0	210.1	1830.0	1
4	210.1	1830.0	310.0	1830.0	1
5	310.0	1830.0	640.0	2000.0	1
6	640.0	2000.0	780.0	2000.0	1
7	780.0	2000.0	890.0	1950.0	1
8	890.0	1950.0	1020.0	1885.0	3
9	1020.0	1885.0	1120.0	1860.0	4
10	1120.0	1860.0	1200.0	1840.0	4

2 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1720.0	890.0	1950.0	3
2	.0	1625.0	1020.0	1885.0	4

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

4 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0
4	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 3 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	14.00	100.0	25.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	14.00	150.0	17.00
3	90.00	225.0	40.00

Soil Unit 4 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	14.00	150.0	11.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

W.O. 8838
Sec. B-B' Backcut

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	310.0	1790.0	400.0	1830.0	70.0
2	500.0	1865.0	800.0	1940.0	80.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	273.59	1830.00
2	327.81	1804.71
3	330.01	1803.69
4	583.27	1865.98
5	585.79	1871.38
6	628.05	1962.01
7	642.03	1992.00
8	642.03	2000.00

** Corrected JANBU FOS = 1.336 ** (Fo factor = 1.080)

Failure surface No. 2 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	313.05	1831.57
2	354.81	1812.10
3	611.50	1873.31
4	614.00	1878.67
5	655.26	1969.31
6	665.85	1992.00
7	666.85	2000.00

** Corrected JANBU FOS = 1.351 ** (Fo factor = 1.078)

Failure surface No. 3 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	272.44	1830.00
2	327.07	1804.52
3	328.12	1804.04
4	616.41	1868.37
5	622.21	1880.80
6	664.47	1971.43
7	674.06	1992.00
8	674.06	2000.00

** Corrected JANBU FOS = 1.351 ** (Fo factor = 1.077)

Failure surface No. 4 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	296.82	1830.00
2	342.76	1808.58
3	343.94	1808.02
4	587.51	1862.54
5	592.43	1873.10
6	634.69	1963.73
7	647.87	1992.00
8	647.87	2000.00

** Corrected JANBU FOS = 1.354 ** (Fo factor = 1.081)

Failure surface No. 5 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	276.61	1830.00
2	329.75	1805.22
3	331.53	1804.39
4	578.35	1862.11
5	582.25	1870.47
6	624.51	1961.10
7	638.58	1991.27
8	638.58	1999.27

** Corrected JANBU FOS = 1.354 ** (Fo factor = 1.081)

Failure surface No. 6 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	275.46	1830.00
2	329.02	1805.03
3	329.64	1804.73
4	611.49	1864.49
5	618.67	1879.88
6	660.93	1970.51
7	670.95	1992.00
8	670.95	2000.00

** Corrected JANBU FOS = 1.364 ** (Fo factor = 1.079)

Failure surface No. 7 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	282.93	1830.00
2	333.82	1806.27
3	339.42	1803.66
4	582.42	1861.25
5	587.34	1871.78
6	629.60	1962.41

7	643.39	1992.00
8	643.39	2000.00

** Corrected JANBU FOS = 1.368 ** (Fo factor = 1.081)

Failure surface No. 8 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	266.11	1830.00
2	320.23	1804.77
3	612.34	1869.22
4	617.12	1879.48
5	559.38	1970.11
6	669.59	1992.00
7	669.59	2000.00

** Corrected JANBU FOS = 1.374 ** (Fo factor = 1.077)

Failure surface No. 9 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	305.27	1830.00
2	346.97	1810.55
3	587.59	1861.25
4	593.21	1873.30
5	635.47	1963.93
6	648.56	1992.00
7	648.56	2000.00

** Corrected JANBU FOS = 1.379 ** (Fo factor = 1.082)

Failure surface No.10 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	295.67	1830.00
2	342.02	1808.39
3	342.05	1808.37
4	620.65	1864.93
5	628.85	1882.51
6	671.11	1973.14
7	679.91	1992.00
8	679.91	2000.00

** Corrected JANBU FOS = 1.381 ** (Fo factor = 1.079)

The following is a summary of the TEN most critical surfaces

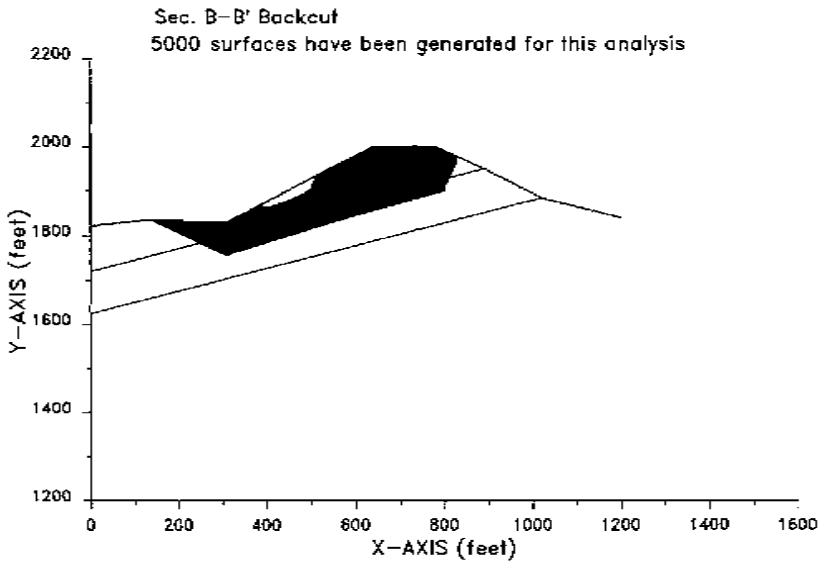
Problem Description : Sec. B-B' Backcut

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.336	1.080	273.59	642.03	1.261E+06
2.	1.351	1.078	313.05	656.85	1.361E+06
3.	1.351	1.077	272.44	674.06	1.489E+06
4.	1.354	1.081	296.82	647.87	1.303E+06
5.	1.354	1.081	276.61	638.58	1.258E+06
6.	1.364	1.079	275.46	670.95	1.493E+06
7.	1.368	1.081	282.93	643.39	1.330E+06
8.	1.374	1.077	266.11	669.59	1.468E+06
9.	1.379	1.082	305.27	648.56	1.311E+06
10.	1.381	1.079	295.67	679.91	1.527E+06

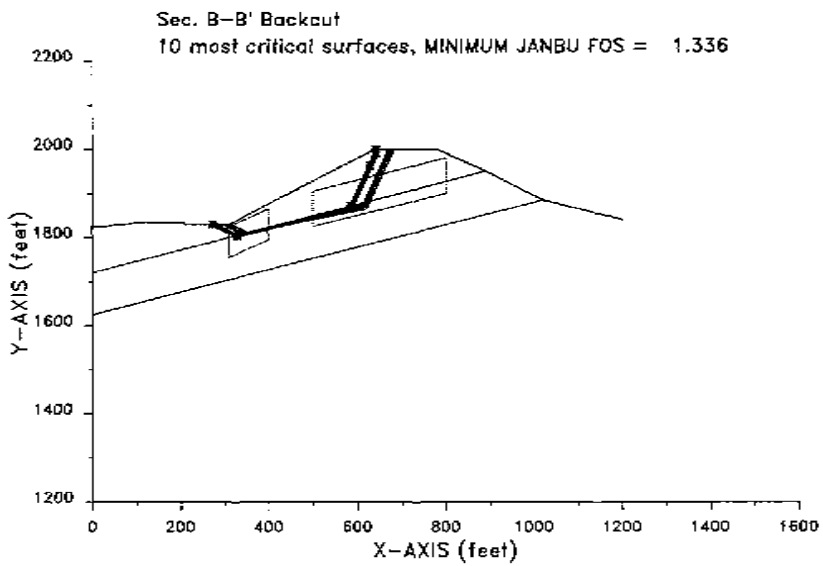
* * * END OF FILE * * *

W.O. 8838
Sec. B-B' Backcut

883888 11-20-** 10:08



883888 11-20-** 10:08



W.O. 8838
Sec. B1-B1' W=100' D=5'

XSTABL File: 8838B1 11-13-** 16:38

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*         All Rights Reserved           *
*                                       *
* Ver. 5.201                96 Â 1545   *
*****************************************
```

Problem Description : Sec. B1-B1' W=100' D=5'

SEGMENT BOUNDARY COORDINATES

12 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1798.0	250.0	1799.0	1
2	250.0	1799.0	260.0	1804.0	1
3	260.0	1804.0	265.0	1804.0	1
4	265.0	1804.0	275.0	1800.0	1
5	275.0	1800.0	320.0	1800.0	1
6	320.0	1800.0	328.0	1804.0	2
7	328.0	1804.0	725.0	1960.0	2
8	725.0	1960.0	740.0	1960.0	2
9	740.0	1960.0	820.0	1955.0	1
10	820.0	1955.0	925.0	1930.0	1
11	925.0	1930.0	1020.0	1885.0	1
12	1020.0	1885.0	1165.0	1820.0	3

4 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	320.0	1800.0	320.1	1795.0	1
2	320.1	1795.0	420.0	1795.0	1
3	420.0	1795.0	740.0	1960.0	1
4	.0	1655.0	1020.0	1885.0	3

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	1
2	125.0	135.0	200.0	34.00	.000	.0	1
3	130.0	140.0	225.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	13.00	225.0	40.00
2	16.00	150.0	17.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	13.00	225.0	40.00
2	16.00	150.0	11.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 5 coordinate points

PHREATIC SURFACE

Point No.	x-water (ft)	y-water (ft)
1	.00	1780.00
2	200.00	1800.00
3	320.00	1800.00
4	328.00	1804.00

5	1000.00	1804.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	300.0	1730.0	600.0	1800.0	100.0
2	650.0	1810.0	920.0	1870.0	100.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	208.52	1798.83
2	257.84	1775.84
3	348.47	1733.58
4	363.44	1726.60
5	787.52	1826.07
6	790.91	1833.34
7	833.17	1923.97
8	841.52	1941.88
9	841.52	1949.88

** Corrected JANBU FOS = 1.448 ** (Fo factor = 1.064)

Failure surface No. 2 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	229.53	1798.92
2	272.12	1779.06
3	362.75	1736.80
4	379.91	1728.80
5	748.84	1818.25
6	751.76	1824.52
7	794.03	1915.15
8	809.19	1947.68
9	809.19	1955.68

** Corrected JANBU FOS = 1.450 ** (Fo factor = 1.071)

Failure surface No. 3 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	238.14	1798.95
2	277.97	1780.38
3	368.60	1738.12
4	389.65	1728.30
5	800.11	1831.50
6	802.15	1835.89
7	844.42	1926.51
8	850.58	1939.72
9	850.58	1947.72

** Corrected JANBU FOS = 1.453 ** (Fo factor = 1.064)

Failure surface No. 4 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	189.92	1798.76
2	245.19	1772.99
3	335.82	1730.72
4	355.36	1722.55
5	787.44	1827.70
6	789.98	1833.13
7	832.24	1923.76
8	840.77	1942.05
9	840.77	1950.05

** Corrected JANBU FOS = 1.455 ** (Fo factor = 1.064)

Failure surface No. 5 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	229.57	1798.92
2	272.14	1779.06
3	362.77	1736.80
4	391.04	1723.62
5	756.86	1822.63
6	758.44	1826.02
7	800.70	1916.65
8	815.00	1947.31
9	815.00	1955.31

** Corrected JANBU FOS = 1.464 ** (Fo factor = 1.069)

Failure surface No. 6 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	236.72	1798.95
2	277.01	1780.16
3	367.64	1737.90
4	387.93	1728.44
5	894.56	1855.25
6	895.33	1856.89

7	925.56	1921.73
8	925.56	1929.73

** Corrected JANBU FOS = 1.458 ** (Fo factor = 1.055)

Failure surface No. 7 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	287.89	1800.00
2	313.02	1788.28
3	403.65	1746.02
4	414.74	1740.85
5	813.69	1837.88
6	814.00	1838.55
7	856.26	1929.18
8	860.12	1937.45
9	860.12	1945.45

** Corrected JANBU FOS = 1.470 ** (Fo factor = 1.061)

Failure surface No. 8 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	258.64	1803.32
2	298.11	1784.92
3	388.74	1742.66
4	415.87	1730.01
5	812.70	1836.92
6	813.40	1838.41
7	855.66	1929.04
8	859.63	1937.56
9	859.63	1945.56

** Corrected JANBU FOS = 1.493 ** (Fo factor = 1.066)

Failure surface No. 9 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	215.19	1798.86
2	262.37	1776.86
3	353.00	1734.60
4	374.99	1724.34
5	735.42	1808.62
6	741.78	1822.25
7	784.04	1912.89
8	800.51	1948.22
9	800.51	1956.22

** Corrected JANBU FOS = 1.493 ** (Fo factor = 1.074)

Failure surface No.10 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	168.91	1798.68
2	230.91	1769.77
3	321.54	1727.50
4	336.89	1720.35
5	826.12	1835.52
6	829.12	1841.96
7	871.39	1932.59
8	872.30	1934.55
9	872.30	1942.55

** Corrected JANBU FOS = 1.495 ** (Fo factor = 1.060)

The following is a summary of the TEN most critical surfaces

Problem Description : Sec. B1-B1' W=100' D=5'

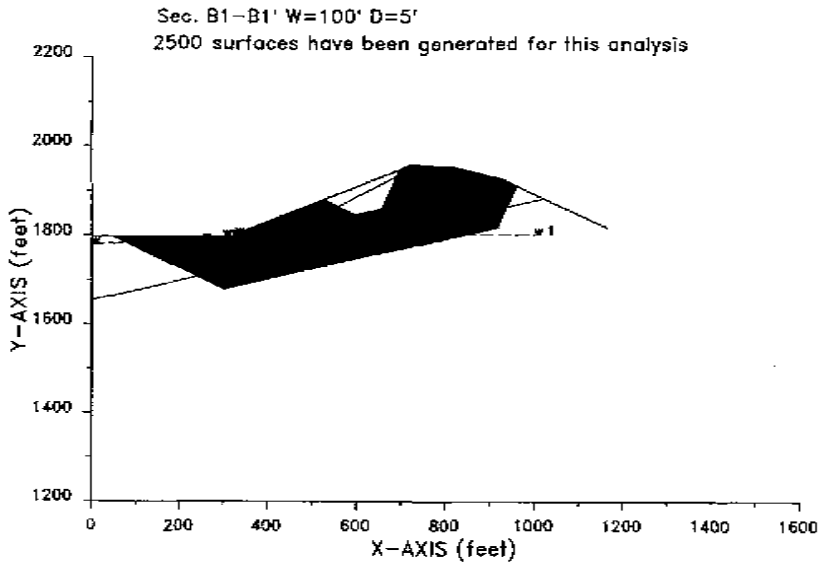
	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.448	1.064	208.52	841.52	2.387E+06
2.	1.450	1.071	229.53	809.19	2.311E+06
3.	1.453	1.064	238.14	850.58	2.401E+06
4.	1.455	1.064	189.92	840.77	2.443E+06
5.	1.464	1.069	229.57	815.00	2.434E+06
6.	1.468	1.056	236.72	925.56	2.424E+06
7.	1.470	1.061	287.89	860.12	2.232E+06
8.	1.493	1.066	258.64	859.63	2.451E+06
9.	1.493	1.074	215.19	800.51	2.436E+06
10.	1.495	1.060	168.91	872.30	2.523E+06

* * * END OF FILE * * *

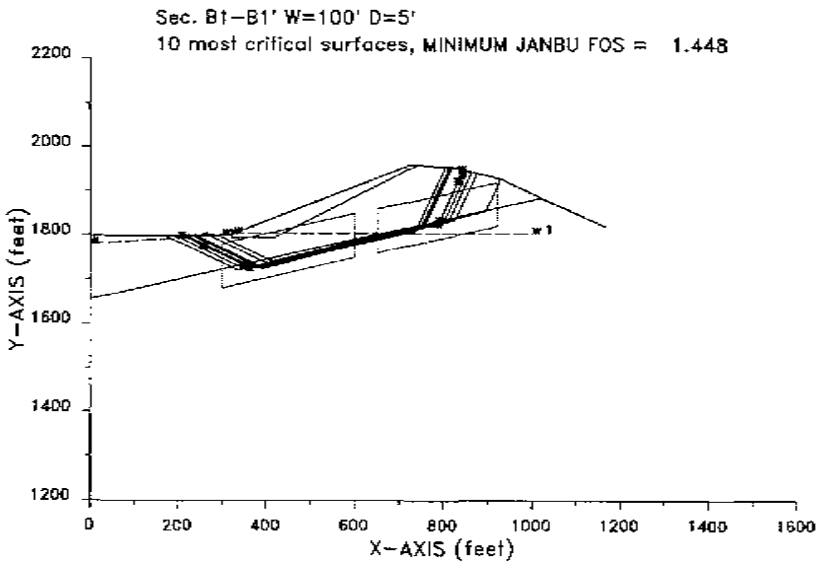
W.O. 8838

Sec. B1-B1' W=100' D=5'

883881 11-13-** 16:38



883881 11-13-** 16:38



W.O. 8838

Sec. B1-B1' Spencer's

XSTABL File: 8838B1S 11-13-** 16:38

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 À 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 À 1545   *
*****************************************
```

Problem Description : Sec. B1-B1' W=100' D=5' Spencer

SEGMENT BOUNDARY COORDINATES

12 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1798.0	250.0	1799.0	1
2	250.0	1799.0	260.0	1804.0	1
3	260.0	1804.0	265.0	1804.0	1
4	265.0	1804.0	275.0	1800.0	1
5	275.0	1800.0	320.0	1800.0	1
6	320.0	1800.0	328.0	1804.0	2
7	328.0	1804.0	725.0	1960.0	2
8	725.0	1960.0	740.0	1960.0	2
9	740.0	1960.0	820.0	1955.0	1
10	820.0	1955.0	925.0	1930.0	1
11	925.0	1930.0	1020.0	1885.0	1
12	1020.0	1885.0	1165.0	1820.0	3

4 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	320.0	1800.0	320.1	1795.0	1
2	320.1	1795.0	420.0	1795.0	1
3	420.0	1795.0	740.0	1960.0	1
4	.0	1655.0	1020.0	1885.0	3

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	1
2	125.0	135.0	200.0	34.00	.000	.0	1
3	130.0	140.0	225.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	13.00	225.0	40.00
2	16.00	150.0	17.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	13.00	225.0	40.00
2	16.00	150.0	11.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 5 coordinate points

PHREATIC SURFACE,

Point No.	x-water (ft)	y-water (ft)
1	.00	1780.00
2	300.00	1800.00
3	320.00	1800.00
4	328.00	1804.00

5	1000.00	1804.00

A SINGLE FAILURE SURFACE HAS BEEN SPECIFIED FOR ANALYSIS

Trial failure surface specified by
the following 9 coordinate points :

Point No.	x-surf (ft)	y-surf (ft)
1	208.52	1798.83
2	257.84	1775.84
3	348.47	1733.58
4	363.44	1726.60
5	787.52	1826.07
6	790.91	1833.34
7	833.17	1923.97
8	841.52	1941.88
9	841.52	1949.88

****
SELECTED METHOD OF ANALYSIS: Spencer (1973)
****

****
SUMMARY OF INDIVIDUAL SLICE INFORMATION
****

Slice	x-base (ft)	y-base (ft)	height (ft)	width (ft)	alpha	beta	weight (lb)
1	213.15	1796.68	2.18	9.26	-25.00	.23	2619.
2	233.89	1787.01	11.93	32.22	-25.00	.23	52736.
3	253.92	1777.67	23.29	7.84	-25.00	26.57	25250.
4	258.92	1775.34	28.12	2.16	-25.00	26.57	8371.
5	262.50	1773.67	30.33	5.00	-25.00	.00	20908.
6	270.00	1770.17	31.83	10.00	-25.00	-21.80	44162.
7	287.50	1762.01	37.99	25.00	-25.00	.00	132757.
8	310.00	1751.52	48.48	20.00	-25.00	.00	135749.
9	320.05	1746.83	53.19	.10	-25.00	26.57	743.
10	324.05	1744.97	57.06	7.90	-25.00	26.57	62829.
11	338.24	1738.35	69.67	20.47	-25.00	21.45	197555.
12	355.96	1730.09	84.90	14.97	-25.00	21.45	174730.
13	391.72	1733.23	95.81	56.56	13.20	21.45	734838.
14	556.71	1771.93	121.94	273.43	13.20	21.45	4383269.
15	709.21	1807.70	146.09	31.57	13.20	21.45	598113.
16	732.50	1813.16	146.84	15.00	13.20	.00	286039.
17	763.76	1820.50	138.02	47.52	13.20	-3.58	852521.
18	789.22	1829.71	127.22	3.39	65.00	-3.58	56085.
19	805.46	1864.53	91.37	29.09	65.00	-3.58	345537.
20	826.58	1909.85	43.58	13.17	65.00	-13.39	74620.
21	837.34	1932.92	17.95	8.35	65.00	-13.39	19478.

ITERATIONS FOR SPENCER'S METHOD

Iter #	Theta	FOS_force	FOS_moment
2	8.8926	1.5784	1.7254
3	8.9706	-----	1.5784
3	8.9316	1.5796	-----
4	8.9699	1.5807	1.5796
5	8.9696	1.5807	1.5807

SLICE INFORMATION ... continued :

Slice	Sigma (psf)	c-value (psf)	phi	U-base (lb)	U-top (lb)	P-top (lb)	Delta
1	624.6	225.0	40.00	0.	0.	0.	.00
2	2068.9	225.0	40.00	18963.	0.	0.	.00
3	3598.3	225.0	40.00	10350.	0.	0.	.00
4	4541.1	225.0	40.00	3246.	0.	0.	.00
5	4871.3	225.0	40.00	8168.	0.	0.	.00
6	4879.0	225.0	40.00	19076.	0.	0.	.00
7	5479.4	225.0	40.00	63674.	0.	0.	.00
8	6845.6	225.0	40.00	66760.	0.	0.	.00
9	8508.6	225.0	40.00	293.	0.	0.	.00
10	9079.7	225.0	40.00	24828.	0.	0.	.00
11	9986.0	225.0	40.00	92545.	0.	0.	.00
12	12589.4	225.0	40.00	76154.	0.	0.	.00
13	8032.4	150.0	11.00	256539.	0.	0.	.00
14	13329.3	150.0	11.00	561967.	0.	0.	.00
15	18095.9	150.0	11.00	0.	0.	0.	.00
16	18215.7	150.0	11.00	0.	0.	0.	.00
17	17138.9	150.0	11.00	0.	0.	0.	.00
18	6792.5	225.0	40.00	0.	0.	0.	.00
19	4845.5	225.0	40.00	0.	0.	0.	.00
20	2249.4	225.0	40.00	0.	0.	0.	.00
21	856.7	225.0	40.00	0.	0.	0.	.00

SPENCER'S (1973) - TOTAL Stresses at center of slice base

Slice #	Base x-coord (ft)	Normal Stress (psf)	Vertical Stress (psf)	Pore Water Pressure (psf)	Shear Stress (psf)
1	213.15	624.6	282.9	.0	473.9
2	233.89	2602.3	1636.6	533.4	1240.6
3	253.92	4894.8	3220.6	1196.5	2105.6
4	258.92	5903.2	3875.3	1362.1	2553.0
5	262.50	6351.9	4181.6	1480.6	2728.3
6	270.00	6607.9	4416.2	1728.9	2732.3
7	287.50	7787.7	5310.3	2308.3	3051.1
8	310.00	9870.8	6787.5	3025.3	3776.3
9	320.05	11164.0	7434.4	2655.4	4659.1
10	324.05	11928.0	7953.0	2848.3	4962.2
11	338.24	14082.5	9648.7	4096.5	5443.4
12	355.96	17201.5	11675.8	4612.1	6825.4
13	391.72	12448.3	12992.2	4415.9	1082.7
14	556.71	15330.3	16030.9	2001.0	1734.0
15	709.21	18095.9	18943.9	.0	2320.2
16	732.50	18215.7	19069.2	.0	2334.9
17	763.76	17138.9	17942.3	.0	2202.5
18	789.22	6792.5	16538.3	.0	3748.1
19	805.46	4845.5	11878.7	.0	2714.5
20	826.58	2249.4	5665.9	.0	1336.4
21	837.34	856.7	2333.1	.0	597.1

SPENCER'S (1973) - Magnitude & Location of Interslice Forces

Slice #	Right x-coord (ft)	Force Angle (degrees)	Interslice Force (lb)	Force Height (ft)	Boundary Height (ft)	Height Ratio

W.O. 8838

Sec. B1-B1' Spencer's

1	217.78	8.97	7270.	2.89	4.35	.664
2	250.00	8.97	87222.	11.12	19.50	.570
3	257.84	8.97	122047.	12.14	27.08	.448
4	260.00	8.97	133649.	12.38	29.17	.424
5	265.00	8.97	162452.	13.03	31.50	.414
6	275.00	8.97	221307.	14.97	32.16	.466
7	300.00	8.97	390436.	20.71	43.82	.473
8	320.00	8.97	560090.	25.03	53.14	.471
9	320.10	8.97	561088.	25.05	53.24	.470
10	328.00	8.97	645259.	26.39	60.88	.433
11	348.47	8.97	894205.	30.04	78.47	.383
12	363.44	8.97	1119126.	32.41	91.33	.355
13	420.00	8.97	1013930.	31.20	100.28	.311
14	693.43	8.97	498573.	31.64	143.59	.220
15	725.00	8.97	437065.	33.50	148.59	.225
16	740.00	8.97	407640.	34.72	145.08	.239
17	787.52	8.97	320203.	40.06	130.96	.306
18	790.91	8.97	283059.	38.14	123.48	.309
19	820.00	8.97	56982.	17.02	59.27	.287
20	833.17	8.97	10482.	8.29	27.89	.297
21	841.52	.00	-1.	3.61	8.00	.451

AVERAGE VALUES ALONG FAILURE SURFACE

Total Normal Stress = 13364.58 (psf)
Pore Water Pressure = 1637.70 (psf)
Shear Stress = 2599.61 (psf)

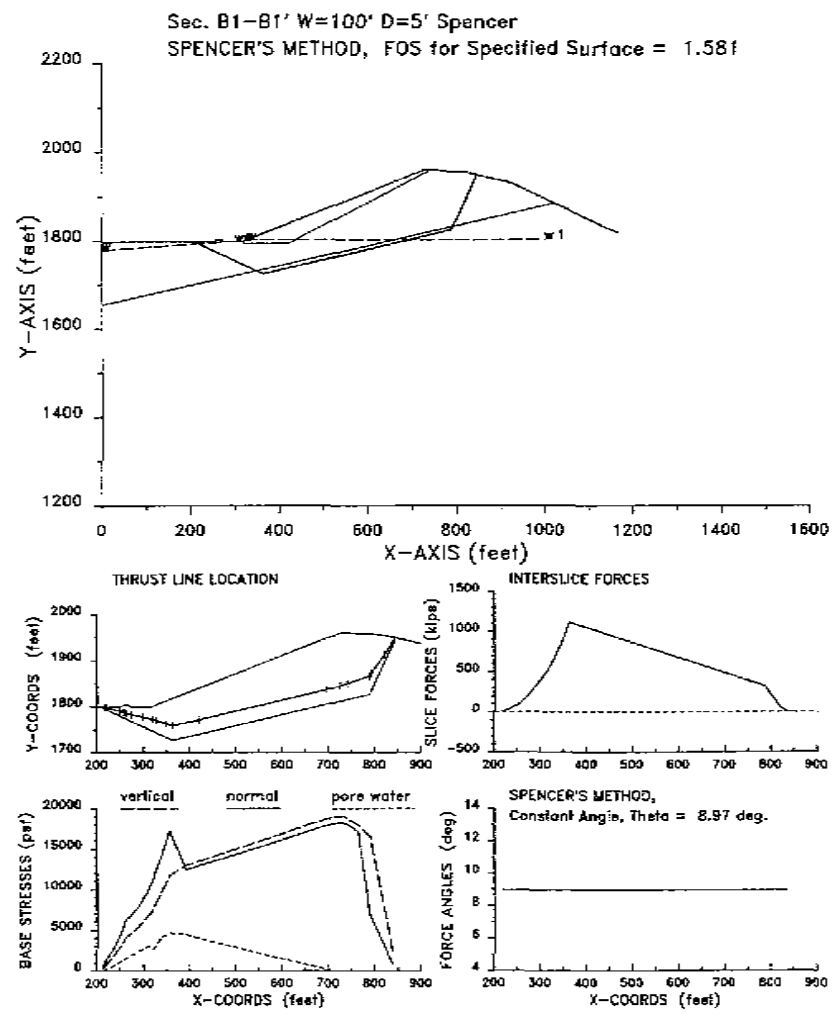
Total Length of failure surface = 734.30 feet

For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S (1973) procedure gives a

FACTOR OF SAFETY = 1.581

Total shear strength available along specified failure surface = 253.60E+04 lb

8838B1S 11-13-** 16:38



Sec. B1-B1' W=100' D=5' Spencer
SPENCER'S METHOD, FOS for Specified Surface = 1.581

W.O. 8838

Sec. B1-B1' Pseudo

XSTABL File: 8838B1P 11-13-** 16:39

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Ä 96        *
*   Interactive Software Designs, Inc.  *
*       Moscow, ID 83843, U.S.A.        *
*                                       *
*         All Rights Reserved           *
*                                       *
*  Ver. 5.201                96 Ä 1545  *
*****************************************
```

Problem Description : Sec. B1-B1' W=100' D=5' Pseudo

SEGMENT BOUNDARY COORDINATES

12 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1798.0	250.0	1799.0	1
2	250.0	1799.0	260.0	1804.0	1
3	260.0	1804.0	265.0	1804.0	1
4	265.0	1804.0	275.0	1800.0	1
5	275.0	1800.0	320.0	1800.0	1
6	320.0	1800.0	328.0	1804.0	2
7	328.0	1804.0	725.0	1960.0	2
8	725.0	1960.0	740.0	1960.0	2
9	740.0	1960.0	820.0	1955.0	1
10	820.0	1955.0	925.0	1930.0	1
11	925.0	1930.0	1020.0	1885.0	1
12	1020.0	1885.0	1165.0	1820.0	3

4 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	320.0	1800.0	320.1	1795.0	1
2	320.1	1795.0	420.0	1795.0	1
3	420.0	1795.0	740.0	1950.0	1
4	.0	1655.0	1020.0	1885.0	3

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	1
2	125.0	135.0	200.0	34.00	.000	.0	1
3	130.0	140.0	225.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	13.00	225.0	40.00
2	16.00	150.0	17.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	13.00	225.0	40.00
2	16.00	150.0	11.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 5 coordinate points

PHREATIC SURFACE,

Point No.	x-water (ft)	y-water (ft)
1	.00	1780.00
2	300.00	1800.00
3	320.00	1800.00
4	328.00	1804.00

5	1000.00	1804.00

A horizontal earthquake loading coefficient
of .150 has been assigned

A vertical earthquake loading coefficient
of .000 has been assigned

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	300.0	1730.0	600.0	1800.0	100.0
2	650.0	1810.0	920.0	1870.0	100.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	236.72	1798.95
2	277.01	1780.16
3	367.64	1737.90
4	387.93	1728.44
5	894.56	1855.25
6	895.33	1856.89
7	925.56	1921.73
8	925.56	1929.73

** Corrected JANBU FOS = .911 ** (Fo factor = 1.056)

Failure surface No. 2 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	208.52	1798.83
2	257.84	1775.84
3	348.47	1733.58
4	363.44	1726.60
5	787.52	1826.07
6	790.91	1833.34
7	833.17	1923.97
8	841.52	1941.88
9	841.52	1949.88

** Corrected JANBU FOS = .926 ** (Fo factor = 1.064)

Failure surface No. 3 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	168.91	1798.68
2	230.91	1769.77
3	321.54	1727.50
4	336.89	1720.35
5	826.12	1835.52
6	829.12	1841.96
7	871.39	1932.59
8	872.30	1934.55
9	872.30	1942.55

** Corrected JANBU FOS = .931 ** (Fo factor = 1.060)

Failure surface No. 4 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	189.92	1798.76
2	245.19	1772.99
3	335.82	1730.72
4	353.36	1722.55
5	787.44	1827.70
6	789.98	1833.13
7	832.24	1923.76
8	840.77	1942.05
9	840.77	1950.05

** Corrected JANBU FOS = .933 ** (Fo factor = 1.064)

Failure surface No. 5 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	238.14	1798.95
2	277.97	1780.38
3	358.60	1738.12
4	389.65	1728.30
5	800.11	1831.50
6	802.15	1835.88
7	844.42	1926.51
8	850.58	1939.72
9	850.58	1947.72

** Corrected JANBU FOS = .939 ** (Fo factor = 1.064)

Failure surface No. 6 specified by 9 coordinate points

Point	x-surf	y-surf

No.	(ft)	(ft)
1	287.89	1800.00
2	313.02	1788.28
3	403.65	1746.02
4	414.74	1740.85
5	813.69	1837.88
6	814.00	1838.55
7	856.26	1929.18
8	860.12	1937.45
9	860.12	1945.45

** Corrected JANBU FOS = .942 ** (Fo factor = 1.061)

Failure surface No. 7 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	176.04	1798.70
2	235.76	1770.86
3	326.39	1728.60
4	356.63	1714.50
5	901.89	1941.16
6	910.85	1960.39
7	936.95	1918.34
8	936.95	1924.34

** Corrected JANBU FOS = .947 ** (Fo factor = 1.058)

Failure surface No. 8 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	229.53	1798.92
2	272.12	1779.06
3	362.75	1736.80
4	379.91	1728.80
5	748.84	1818.25
6	751.76	1824.52
7	794.03	1915.15
8	809.19	1947.68
9	809.19	1955.68

** Corrected JANBU FOS = .952 ** (Fo factor = 1.071)

Failure surface No. 9 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	263.44	1804.00
2	302.32	1785.87
3	392.95	1743.61
4	419.23	1731.36
5	902.73	1856.38
6	903.86	1858.81
7	931.82	1918.77
8	931.82	1926.77

** Corrected JANBU FOS = .953 ** (Fo factor = 1.058)

Failure surface No.10 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	185.20	1798.74
2	241.99	1772.26
3	332.62	1730.00
4	373.98	1710.71
5	889.00	1853.25
6	890.16	1855.72
7	921.46	1922.84
8	921.46	1930.84

** Corrected JANBU FOS = .953 ** (Fo factor = 1.062)

The following is a summary of the TEN most critical surfaces

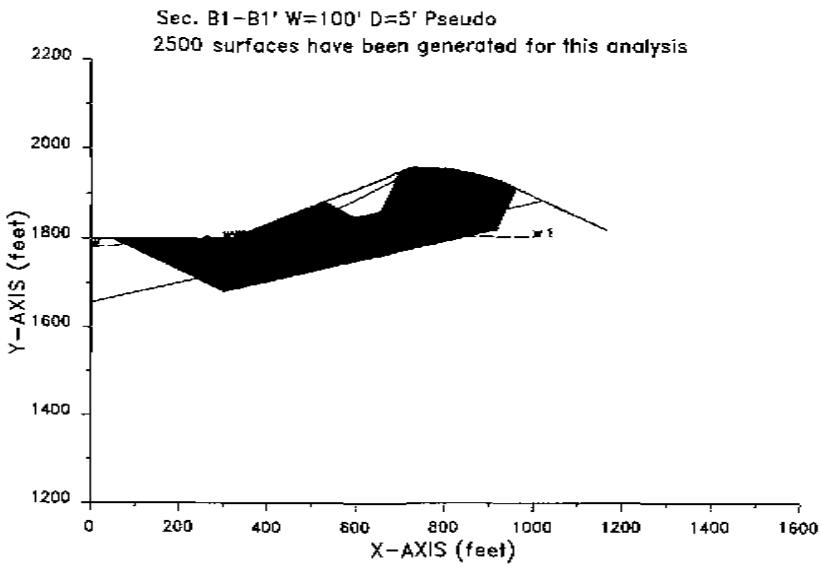
Problem Description : Sec. B1-B1' W=100' D=5' Pseudo

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	.911	1.056	236.72	925.56	2.591E+06
2.	.926	1.064	208.52	841.52	2.470E+06
3.	.931	1.060	168.91	872.30	2.647E+06
4.	.933	1.064	189.92	840.77	2.539E+06
5.	.939	1.064	236.14	850.58	2.503E+06
6.	.942	1.061	287.89	860.12	2.324E+06
7.	.947	1.058	176.04	936.95	2.995E+06
8.	.952	1.071	229.53	809.19	2.371E+06
9.	.953	1.058	263.44	931.82	2.668E+06
10.	.953	1.062	185.20	921.46	3.009E+06

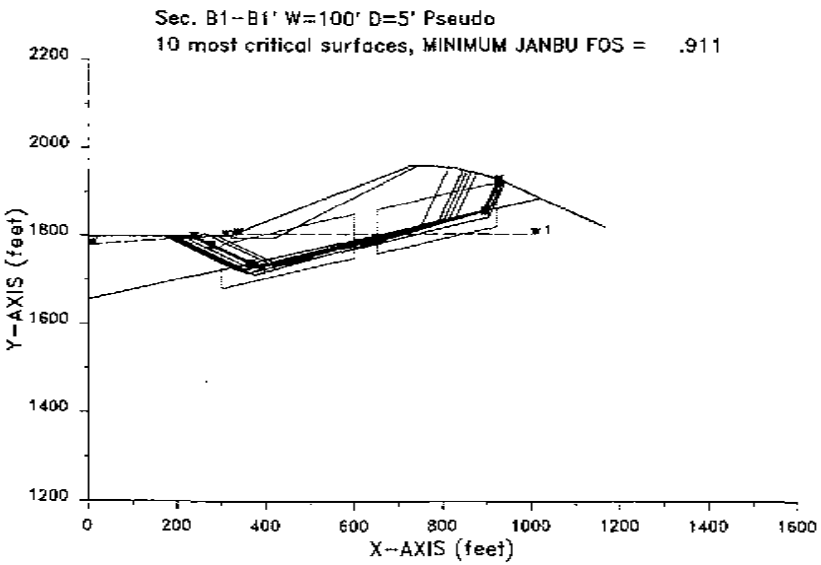
* * * END OF FILE * * *

W.O. 8838
Sec. B1-B1' Pseudo

8838B1P 11-13-** 16:39



8838B1P 11-13-** 16:39



W.O. 8838

Sec. B1-B1' Pseudo., Spencer's

XSTABL File: 8838B1PS 11-13-** 16:39

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 A 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 A 1545   *
*****************************************
```

Problem Description : Sec. B1-B1' W=100' D=5' Pseudo Spenc

SEGMENT BOUNDARY COORDINATES

12 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1798.0	250.0	1799.0	1
2	250.0	1799.0	260.0	1804.0	1
3	260.0	1804.0	265.0	1804.0	1
4	265.0	1804.0	275.0	1800.0	1
5	275.0	1800.0	320.0	1800.0	1
6	320.0	1800.0	328.0	1804.0	2
7	328.0	1804.0	725.0	1960.0	2
8	725.0	1960.0	740.0	1960.0	2
9	740.0	1960.0	820.0	1955.0	1
10	820.0	1955.0	925.0	1930.0	1
11	925.0	1930.0	1020.0	1885.0	1
12	1020.0	1885.0	1165.0	1820.0	3

4 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	320.0	1800.0	320.1	1795.0	1
2	320.1	1795.0	420.0	1795.0	1
3	420.0	1795.0	740.0	1960.0	1
4	.0	1655.0	1020.0	1885.0	3

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	1
2	125.0	135.0	200.0	34.00	.000	.0	1
3	130.0	140.0	225.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	13.00	225.0	40.00
2	16.00	150.0	17.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	13.00	225.0	40.00
2	16.00	150.0	11.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 5 coordinate points

PHREATIC SURFACE,

Point No.	x-water (ft)	y-water (ft)
1	.00	1780.00
2	300.00	1800.00
3	320.00	1800.00
4	328.00	1804.00

5	1000.00	1804.00

A horizontal earthquake loading coefficient
of .150 has been assigned

A vertical earthquake loading coefficient
of .000 has been assigned

A SINGLE FAILURE SURFACE HAS BEEN SPECIFIED FOR ANALYSIS

Trial failure surface specified by
the following 9 coordinate points :

Point No.	x-surf (ft)	y-surf (ft)
1	236.72	1798.95
2	277.01	1780.16
3	367.64	1737.90
4	387.93	1728.44
5	894.56	1855.25
6	895.33	1856.89
7	925.56	1921.73
8	925.56	1921.73
9	925.56	1929.73

****
SELECTED METHOD OF ANALYSIS: Spencer (1973)
****

****
SUMMARY OF INDIVIDUAL SLICE INFORMATION
****

Slice	x-base (ft)	y-base (ft)	height (ft)	width (ft)	alpha	beta	weight (lb)
1	239.69	1797.56	1.40	5.94	-25.00	.23	1078.
2	246.33	1794.47	4.52	7.34	-25.00	.23	4456.
3	255.00	1790.42	11.08	10.00	-25.00	26.57	15058.
4	262.50	1786.93	17.07	5.00	-25.00	.00	11627.
5	270.00	1783.43	18.57	10.00	-25.00	-21.80	25600.
6	276.01	1780.63	19.37	2.01	-25.00	.00	5419.
7	288.51	1774.80	25.20	22.99	-25.00	.00	80932.
8	310.00	1764.78	35.22	20.00	-25.00	.00	98624.
9	320.05	1760.09	39.93	.10	-25.00	26.57	558.
10	324.05	1758.23	43.80	7.90	-25.00	26.57	48165.
11	347.82	1747.14	64.65	39.64	-25.00	21.45	352360.
12	377.79	1733.17	90.39	20.29	-25.00	21.45	249890.
13	403.96	1732.45	101.40	32.07	14.05	21.45	439449.
14	554.90	1770.23	122.93	269.81	14.05	21.45	4364185.
15	707.40	1808.40	144.68	35.19	14.05	21.45	660195.
16	732.50	1814.69	145.31	15.00	14.05	.00	283072.
17	780.00	1826.58	130.92	80.00	14.05	-3.58	1361614.
18	857.28	1845.92	100.20	74.56	14.05	-13.39	971267.
19	894.95	1856.07	81.09	.77	64.85	-13.39	8117.
20	910.17	1888.71	44.82	29.67	65.00	-13.39	172885.
21	925.28	1921.13	8.74	.56	65.00	-25.35	636.

ITERATIONS FOR SPENCER'S METHOD

Iter #	Theta	FOS_force	FOS_moment
2	15.5312	1.1924	1.0680
3	14.9060	-----	1.1924
3	15.2186	1.1835	-----
4	14.9445	1.1758	1.1835
5	14.9785	-----	1.1758
5	14.9615	1.1763	-----
6	14.9757	1.1767	1.1763

SLICE INFORMATION ... continued :

Slice	Sigma (psf)	c-value (psf)	phi	U-base (lb)	U-top (lb)	P-top (lb)	Delta
1	893.7	225.0	40.00	0.	0.	0.	.00
2	1751.9	225.0	40.00	984.	0.	0.	.00
3	3488.7	225.0	40.00	4508.	0.	0.	.00
4	5106.2	225.0	40.00	3624.	0.	0.	.00
5	5128.5	225.0	40.00	9998.	0.	0.	.00
6	5005.0	225.0	40.00	2449.	0.	0.	.00
7	6223.8	225.0	40.00	38504.	0.	0.	.00
8	8380.3	225.0	40.00	48502.	0.	0.	.00
9	10652.9	225.0	40.00	220.	0.	0.	.00
10	11587.1	225.0	40.00	19059.	0.	0.	.00
11	15815.0	225.0	40.00	155184.	0.	0.	.00
12	22991.4	225.0	40.00	98941.	0.	0.	.00
13	7886.1	150.0	11.00	147594.	0.	0.	.00
14	12480.2	150.0	11.00	586028.	0.	0.	.00
15	16923.5	150.0	11.00	0.	0.	0.	.00
16	17024.9	150.0	11.00	0.	0.	0.	.00
17	15355.0	150.0	11.00	0.	0.	0.	.00
18	11752.6	150.0	11.00	0.	0.	0.	.00
19	3368.8	225.0	40.00	0.	0.	0.	.00
20	1797.1	225.0	40.00	0.	0.	0.	.00
21	296.5	225.0	40.00	0.	0.	0.	.00

SPENCER'S (1973) - TOTAL Stresses at center of slice base

Slice #	Base x-coord (ft)	Normal Stress (psf)	Vertical Stress (psf)	Pore Water Pressure (psf)	Shear Stress (psf)
1	239.69	893.7	181.6	.0	828.5
2	246.33	1873.4	607.1	121.5	1440.5
3	255.00	3897.3	1505.8	408.6	2679.0
4	262.50	5763.1	2325.4	656.9	3832.5
5	270.00	6033.7	2560.0	905.2	3848.4
6	276.01	6109.0	2696.0	1104.0	3760.3
7	288.51	7741.7	3520.3	1517.9	4629.4
8	310.00	10578.2	4931.2	2197.9	6167.2
9	320.05	12646.4	5578.2	1993.5	7787.8
10	324.05	13773.6	6096.8	2186.5	8454.0
11	347.82	19363.0	8888.7	3548.0	11469.0
12	377.79	27411.2	12316.6	4419.8	16586.5
13	403.96	12350.6	13702.8	4464.5	1430.2
14	554.90	14587.2	16175.2	2107.0	2189.1
15	707.40	16923.5	18759.1	.0	2923.1
16	732.50	17024.9	18871.5	.0	2939.9
17	780.00	15355.0	17020.2	.0	2664.0
18	857.28	11752.6	13026.6	.0	2068.9
19	894.95	3368.8	10541.2	.0	2593.6
20	910.17	1797.1	5826.9	.0	1472.7
21	925.28	296.5	1135.9	.0	402.6

W.O. 8838
Sec. B1-B1' Pseudo., Spencer's

SPENCER'S (1973) - Magnitude & Location of Interslice Forces

Slice #	Right x-coord (ft)	Force Angle (degrees)	Interslice Force (lb)	Force Height (ft)	Boundary Height (ft)	Height Ratio
1	242.66	14.98	7489.	2.16	2.79	.775
2	250.00	14.98	24380.	4.12	6.25	.660
3	260.00	14.98	68586.	6.25	15.91	.393
4	265.00	14.98	100525.	7.20	18.24	.395
5	275.00	14.98	165511.	10.05	18.90	.531
6	277.01	14.98	178420.	10.69	19.84	.539
7	300.00	14.98	361936.	17.43	30.56	.570
8	320.00	14.98	576422.	22.42	39.89	.562
9	320.10	14.98	577752.	22.44	39.98	.561
10	328.00	14.98	691929.	23.82	47.62	.500
11	367.64	14.98	1478342.	31.32	81.68	.383
12	387.93	14.98	2056306.	34.47	99.11	.348
13	420.00	14.98	1932925.	35.49	103.68	.342
14	689.91	14.98	846934.	40.15	142.17	.282
15	725.00	14.98	696595.	38.86	147.19	.264
16	740.00	14.98	632122.	38.05	143.44	.265
17	820.00	14.98	323033.	33.63	118.41	.284
18	894.56	14.98	104859.	34.13	82.00	.416
19	895.33	14.98	99947.	33.83	80.17	.422
20	925.00	14.98	-52.	-.63	9.47	-.066
21	925.56	.00	-277.	-.06	8.00	-.008

AVERAGE VALUES ALONG FAILURE SURFACE

Total Normal Stress = 14359.30 (psf)
Pore Water Pressure = 1463.15 (psf)
Shear Stress = 3945.41 (psf)

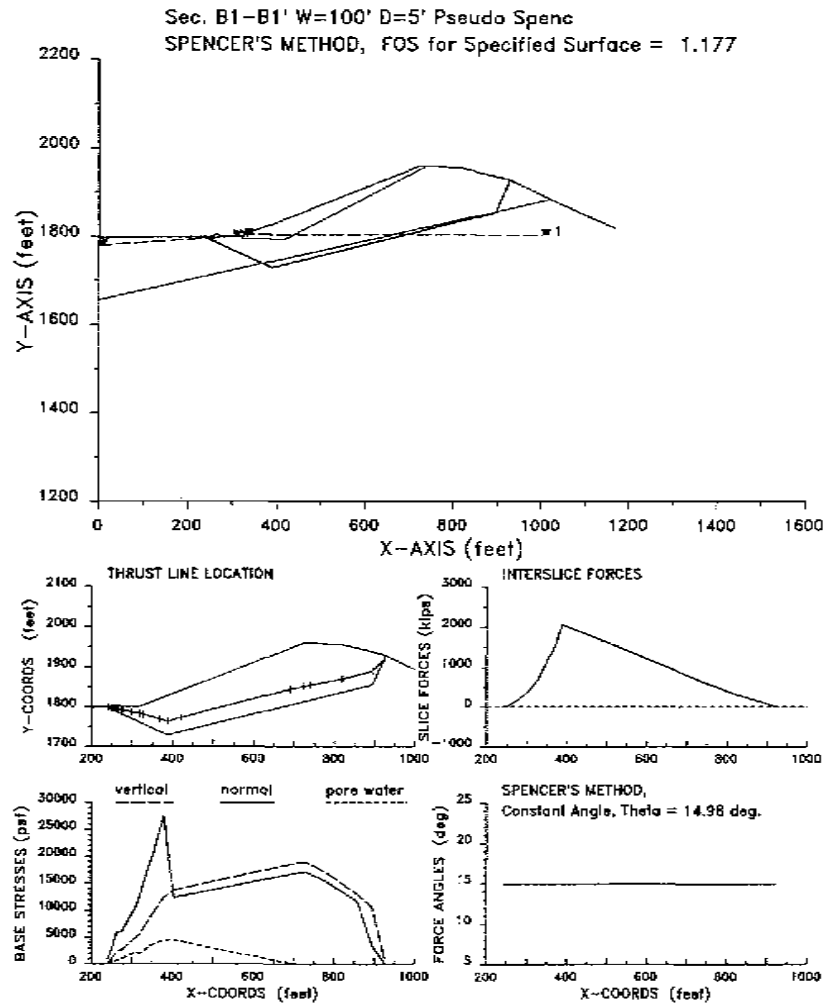
Total Length of failure surface = 762.45 feet

For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S (1973) procedure gives a

FACTOR OF SAFETY = 1.177

Total shear strength available along specified failure surface = 307.66E+04 lb

8838B1PS 11-13-** 16:39



Sec. B1-B1' W=100' D=5' Pseudo Spenc
SPENCER'S METHOD, FOS for Specified Surface = 1.177

W.O. 8838

Sec. B1-B1' Backcut

XSTABL File: 8838B1B 11-13-** 16:41

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*         Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 Â 1545   *
*****************************************
```

Problem Description : Sec. B1-B1' Backcut

SEGMENT BOUNDARY COORDINATES
---

12 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1798.0	250.0	1799.0	1
2	250.0	1799.0	260.0	1804.0	1
3	260.0	1804.0	265.0	1804.0	1
4	265.0	1804.0	275.0	1800.0	1
5	275.0	1800.0	320.0	1800.0	1
6	320.0	1800.0	320.1	1795.0	1
7	320.1	1795.0	420.0	1795.0	1
8	420.0	1795.0	740.0	1960.0	1
9	740.0	1960.0	820.0	1955.0	1
10	820.0	1955.0	925.0	1930.0	1
11	925.0	1930.0	1020.0	1885.0	1
12	1020.0	1885.0	1165.0	1820.0	3

1 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1655.0	1020.0	1885.0	3

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

---
ISOTROPIC Soil Parameters
---

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	13.00	225.0	40.00
2	16.00	150.0	17.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	13.00	225.0	40.00
2	16.00	150.0	11.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)

1	400.0	1735.0	600.0	1800.0	100.0
2	650.0	1810.0	920.0	1870.0	100.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	349.27	1795.00
2	437.80	1753.72
3	449.30	1748.36
4	711.98	1815.57
5	754.24	1906.20
6	774.59	1949.84
7	774.59	1957.84

** Corrected JANBU FOS = 1.323 ** (Fo factor = 1.080)

Failure surface No. 2 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	339.17	1795.00
2	340.36	1794.45
3	430.99	1752.18
4	440.56	1747.72
5	840.68	1842.86
6	841.57	1844.77
7	882.33	1932.16
8	882.33	1940.16

** Corrected JANBU FOS = 1.333 ** (Fo factor = 1.059)

Failure surface No. 3 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	381.09	1795.00
2	459.24	1758.56
3	473.55	1751.88
4	715.72	1812.41
5	717.79	1816.85
6	760.05	1907.49
7	779.65	1949.52
8	779.65	1957.52

** Corrected JANBU FOS = 1.351 ** (Fo factor = 1.082)

Failure surface No. 4 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	386.10	1795.00
2	462.62	1759.32
3	475.79	1753.18
4	805.74	1831.87
5	808.25	1837.25
6	850.52	1927.88
7	855.49	1938.55
8	855.49	1946.55

** Corrected JANBU FOS = 1.352 ** (Fo factor = 1.070)

Failure surface No. 5 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	366.98	1795.00
2	449.74	1756.41
3	476.49	1743.94
4	813.69	1837.88
5	814.00	1838.55
6	856.26	1929.18
7	860.12	1937.45
8	860.12	1945.45

** Corrected JANBU FOS = 1.365 ** (Fo factor = 1.066)

Failure surface No. 6 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	352.60	1795.00
2	440.04	1754.22
3	462.41	1743.80
4	796.67	1828.16
5	800.05	1835.40
6	842.31	1926.03
7	848.88	1940.12
8	848.88	1948.12

** Corrected JANBU FOS = 1.378 ** (Fo factor = 1.070)

Failure surface No. 7 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	387.84	1795.00
2	463.79	1759.58
3	486.60	1748.94
4	809.34	1831.97
5	812.22	1838.15
6	854.48	1928.78
7	858.68	1937.79
8	858.68	1945.79

** Corrected JANBU FOS = 1.401 ** (Fo factor = 1.069)

Failure surface No. 8 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	387.91	1795.00

2	463.84	1759.59
3	490.86	1746.99
4	770.58	1825.76
5	772.15	1829.11
6	814.41	1919.74
7	826.41	1945.47
8	826.41	1953.47

** Corrected JANBU FOS = 1.404 ** (Fo factor = 1.076)

Failure surface No. 9 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	338.28	1795.00
2	339.76	1794.31
3	430.39	1752.05
4	452.57	1741.70
5	740.90	1812.24
6	746.02	1823.22
7	788.28	1913.85
8	804.20	1947.99
9	804.20	1955.99

** Corrected JANBU FOS = 1.404 ** (Fo factor = 1.079)

Failure surface No.10 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	409.65	1795.00
2	478.49	1762.90
3	488.96	1758.02
4	866.02	1850.46
5	901.94	1927.49
6	901.94	1935.49

** Corrected JANBU FOS = 1.408 ** (Fo factor = 1.056)

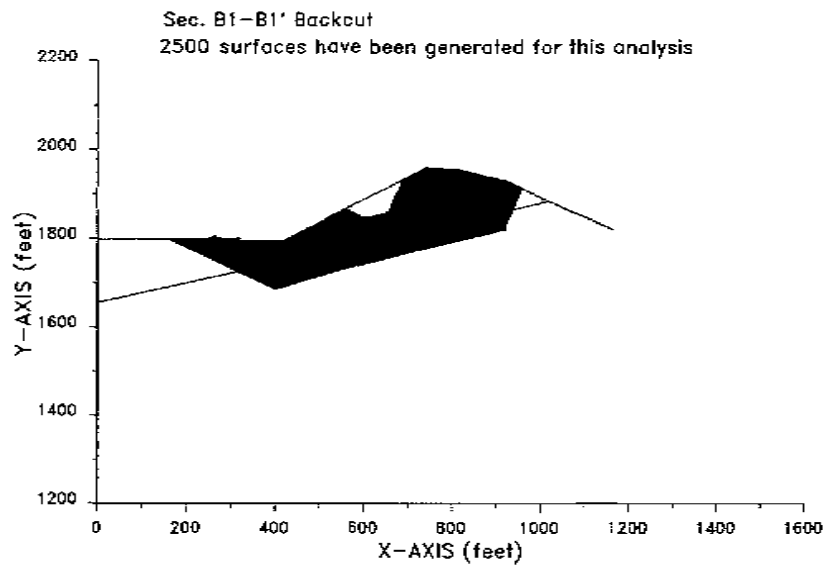
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. B1-B1' Backcut

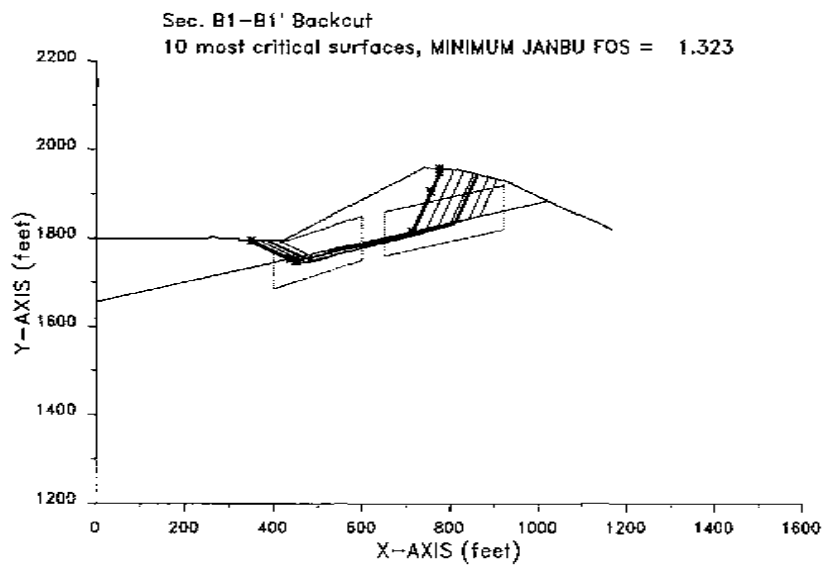
	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.323	1.080	349.27	774.59	1.660E+06
2.	1.333	1.059	339.17	882.33	1.861E+06
3.	1.351	1.082	381.09	779.65	1.700E+06
4.	1.352	1.070	386.10	855.49	1.844E+06
5.	1.365	1.066	366.98	860.12	2.022E+06
6.	1.378	1.070	352.60	848.83	2.015E+06
7.	1.401	1.069	387.84	858.68	1.993E+06
8.	1.404	1.076	387.91	826.41	1.986E+06
9.	1.404	1.079	338.28	804.20	1.993E+06
10.	1.408	1.056	409.65	901.94	1.866E+06

* * END OF FILE * * *

8838B1B 11-13-** 16:41



8838B1B 11-13-** 16:41



W.O. 8838
Sec.B2-B2' W=60' D=5'

XSTABL File: BB3BB2 11-14-** 14:56

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 Â 1545   *
*****************************************
```

Problem Description : Sec. B2-B2' W=60' D=5'

SEGMENT BOUNDARY COORDINATES

16 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1852.0	140.0	1852.0	1
2	140.0	1852.0	148.0	1856.0	1
3	148.0	1856.0	153.0	1856.0	1
4	153.0	1856.0	165.0	1850.0	1
5	165.0	1850.0	215.0	1850.0	1
6	215.0	1850.0	395.0	1925.0	2
7	395.0	1925.0	440.0	1925.0	2
8	440.0	1925.0	460.0	1925.0	1
9	460.0	1925.0	580.0	1960.0	1
10	580.0	1960.0	600.0	1960.0	1
11	600.0	1960.0	650.0	1950.0	1
12	650.0	1950.0	760.0	2010.0	1
13	760.0	2010.0	800.0	2015.0	1
14	800.0	2015.0	835.0	2000.0	1
15	835.0	2000.0	960.0	1950.0	1
16	960.0	1950.0	1070.0	1900.0	2

4 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	215.0	1850.0	215.1	1845.0	1
2	215.1	1845.0	275.0	1845.0	1
3	275.0	1845.0	440.0	1925.0	1
4	.0	1725.0	960.0	1950.0	3

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	1
2	125.0	135.0	200.0	34.00	.000	.0	1
3	130.0	140.0	225.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	6.00	225.0	40.00
2	12.00	150.0	17.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	6.00	225.0	40.00
2	12.00	150.0	11.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 4 coordinate points

PHREATIC SURFACE,

Point No.	x-water (ft)	y-water (ft)

GEOLABS-WESTLAKE VILLAGE

Plate B2.1

W.O. 8838
Sec.B2-B2' W=60' D=5'

1	.00	1850.00
2	215.00	1850.00
3	227.00	1856.00
4	1000.00	1856.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	220.0	1800.0	360.0	1835.0	100.0
2	380.0	1840.0	880.0	1930.0	100.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	79.04	1852.00
2	143.22	1822.07
3	233.85	1779.81
4	237.14	1778.28
5	767.91	1889.76
6	775.87	1906.85
7	818.13	1997.48
8	818.82	1998.94
9	818.82	2006.94

** Corrected JANBU FOS = 1.521 ** (Fo factor = 1.056)

Failure surface No. 2 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	124.66	1852.00
2	173.59	1829.19
3	264.22	1786.93
4	265.86	1786.16
5	783.45	1886.96
6	794.78	1911.28
7	832.85	1992.92
8	832.85	2000.92

** Corrected JANBU FOS = 1.522 ** (Fo factor = 1.056)

Failure surface No. 3 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	181.10	1850.00
2	223.70	1830.14
3	756.95	1939.30
4	787.81	2005.48
5	787.81	2013.48

** Corrected JANBU FOS = 1.567 ** (Fo factor = 1.043)

Failure surface No. 4 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	198.87	1850.00
2	228.32	1836.27
3	790.14	1953.58
4	812.55	2001.62
5	812.55	2009.62

** Corrected JANBU FOS = 1.574 ** (Fo factor = 1.034)

Failure surface No. 5 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	85.17	1852.00
2	147.30	1823.03
3	237.93	1780.77
4	251.82	1774.29
5	749.97	1875.91
6	762.99	1903.83
7	805.25	1994.46
8	809.25	2003.03
9	809.25	2011.03

** Corrected JANBU FOS = 1.575 ** (Fo factor = 1.062)

Failure surface No. 6 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	98.21	1852.00
2	155.98	1825.05
3	246.61	1782.80
4	266.42	1773.56
5	765.10	1877.96
6	778.90	1907.55
7	821.06	1997.97
8	821.06	2005.97

** Corrected JANBU FOS = 1.580 ** (Fo factor = 1.060)

W.O. 8838
Sec.B2-B2' W=60' D=5'

Failure surface No. 7 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	62.55	1852.00
2	131.94	1819.64
3	222.57	1777.38
4	736.26	1879.77
5	745.57	1899.74
6	787.83	1990.37
7	795.31	2006.41
8	795.31	2014.41

** Corrected JANBU FOS = 1.581 ** (Fo factor = 1.062)

Failure surface No. 8 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	206.32	1850.00
2	215.09	1845.33
3	215.72	1845.00
4	243.01	1832.28
5	772.21	1939.73
6	802.98	2005.72
7	802.98	2013.72

** Corrected JANBU FOS = 1.586 ** (Fo factor = 1.044)

Failure surface No. 9 specified by 10 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	207.58	1850.00
2	215.08	1846.01
3	216.99	1845.00
4	225.04	1841.25
5	315.67	1798.98
6	316.75	1798.48
7	792.07	1897.92
8	798.72	1912.20
9	835.79	1991.69
10	835.79	1999.69

** Corrected JANBU FOS = 1.595 ** (Fo factor = 1.056)

Failure surface No.10 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	165.64	1850.00
2	198.00	1834.91
3	288.63	1792.65
4	297.36	1788.58
5	838.56	1902.16
6	848.70	1923.91
7	873.30	1976.68
8	873.30	1984.68

** Corrected JANBU FOS = 1.597 ** (Fo factor = 1.049)

The following is a summary of the TEN most critical surfaces

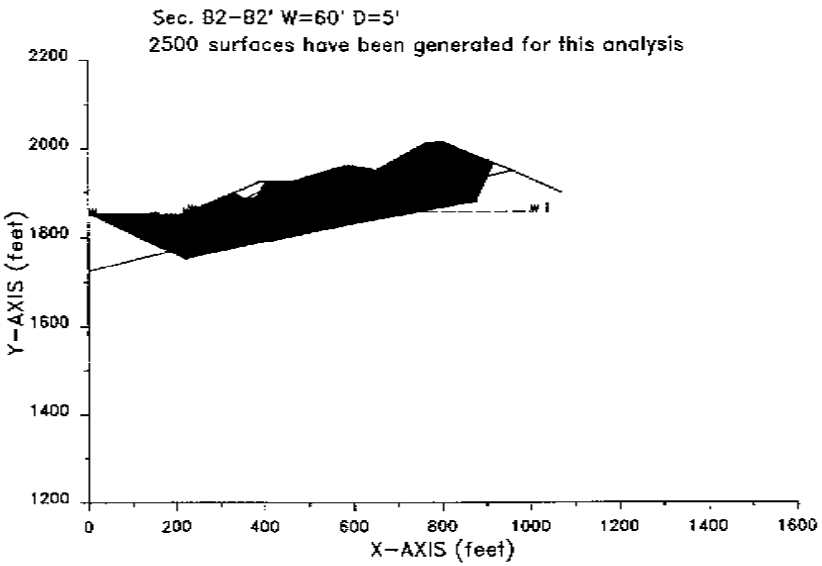
Problem Description : Sec. B2-B2' W=60' D=5'

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.521	1.056	79.04	818.82	2.353E+06
2.	1.522	1.056	124.66	832.85	2.302E+06
3.	1.567	1.043	181.10	787.81	1.246E+06
4.	1.574	1.034	198.87	812.55	1.143E+06
5.	1.575	1.062	85.17	809.25	2.533E+06
6.	1.580	1.060	98.21	821.06	2.606E+06
7.	1.581	1.062	62.55	795.31	2.344E+06
8.	1.586	1.044	206.32	802.98	1.329E+06
9.	1.595	1.056	207.58	835.79	2.157E+06
10.	1.597	1.049	165.64	873.30	2.282E+06

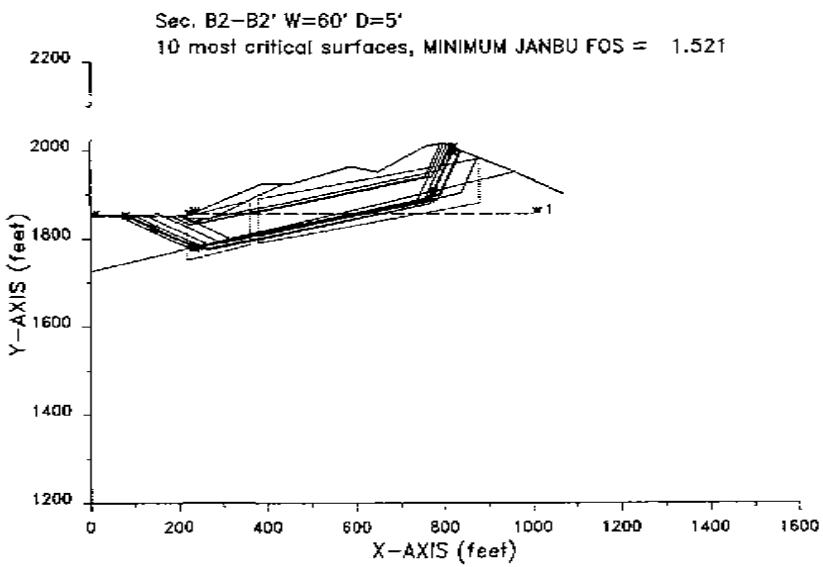
* * * END OF FILE * * *

W.O. 8838
Sec.B2-B2' W=60' D=5'

883882 11-14-** 14:56



883892 11-14-** 14:56



XSTABL File: 8838B2B 11-14-** 14:59

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 Â 1545   *
*****************************************
```

Problem Description : Sec. B2-B2' Backcut

SEGMENT BOUNDARY COORDINATES

17 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1852.0	140.0	1852.0	1
2	140.0	1852.0	148.0	1856.0	1
3	148.0	1856.0	153.0	1856.0	1
4	153.0	1856.0	165.0	1850.0	1
5	165.0	1850.0	215.0	1850.0	1
6	215.0	1850.0	215.1	1845.0	1
7	215.1	1845.0	275.0	1845.0	1
8	275.0	1845.0	440.0	1925.0	1
9	440.0	1925.0	460.0	1925.0	1
10	460.0	1925.0	580.0	1960.0	1
11	580.0	1960.0	600.0	1960.0	1
12	600.0	1960.0	650.0	1950.0	1
13	650.0	1950.0	760.0	2010.0	1
14	760.0	2010.0	800.0	2015.0	1
15	800.0	2015.0	835.0	2000.0	1
16	835.0	2000.0	960.0	1950.0	1
17	960.0	1950.0	1070.0	1900.0	2

1 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1725.0	960.0	1950.0	3

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	6.00	225.0	40.00
2	12.00	150.0	17.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	6.00	225.0	40.00
2	12.00	150.0	11.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of

sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	260.0	1780.0	360.0	1835.0	100.0
2	380.0	1840.0	880.0	1930.0	100.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	217.47	1845.00
2	225.36	1841.32
3	315.99	1799.06
4	323.73	1795.45
5	768.89	1889.49
6	777.12	1907.14
7	819.38	1997.77
8	819.74	1998.54
9	819.74	2006.54

** Corrected JANBU FOS = 1.489 ** (Fo factor = 1.062)

Failure surface No. 2 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	289.91	1852.23
2	295.62	1849.56
3	466.30	1883.30
4	485.48	1924.43
5	485.48	1932.43

** Corrected JANBU FOS = 1.492 ** (Fo factor = 1.067)

Failure surface No. 3 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	259.59	1845.00
2	277.40	1836.69
3	751.13	1929.13
4	786.67	2005.33
5	786.67	2013.33

** Corrected JANBU FOS = 1.500 ** (Fo factor = 1.052)

Failure surface No. 4 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	328.16	1870.78
2	340.03	1865.24
3	767.95	1955.89
4	791.28	2005.91
5	791.28	2013.91

** Corrected JANBU FOS = 1.513 ** (Fo factor = 1.043)

Failure surface No. 5 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	277.52	1846.22
2	289.50	1840.63
3	774.59	1934.34
4	807.06	2003.97
5	807.06	2011.97

** Corrected JANBU FOS = 1.523 ** (Fo factor = 1.049)

Failure surface No. 6 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	310.66	1862.29
2	323.64	1856.24
3	433.25	1878.43
4	451.24	1917.00
5	451.24	1925.00

** Corrected JANBU FOS = 1.524 ** (Fo factor = 1.078)

Failure surface No. 7 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	275.82	1845.40
2	289.53	1839.01
3	758.06	1926.39
4	795.38	2006.42
5	795.38	2014.42

** Corrected JANBU FOS = 1.533 ** (Fo factor = 1.054)

Failure surface No. 8 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	308.72	1861.35
2	320.80	1855.72
3	791.26	1951.69
4	814.21	2000.91
5	814.21	2008.91

** Corrected JANBU FOS = 1.541 ** (Fo factor = 1.040)

Failure surface No. 9 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)

1	305.86	1859.96
2	313.76	1856.28
3	759.75	1940.09
4	790.39	2005.80
5	790.39	2013.80

** Corrected JANBU FOS = 1.546 ** (Fo factor = 1.050)

Failure surface No.10 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	259.93	1845.00
2	342.55	1806.47
3	792.62	1891.47
4	802.73	1913.14
5	838.79	1990.48
6	838.79	1998.48

** Corrected JANBU FOS = 1.550 ** (Fo factor = 1.060)

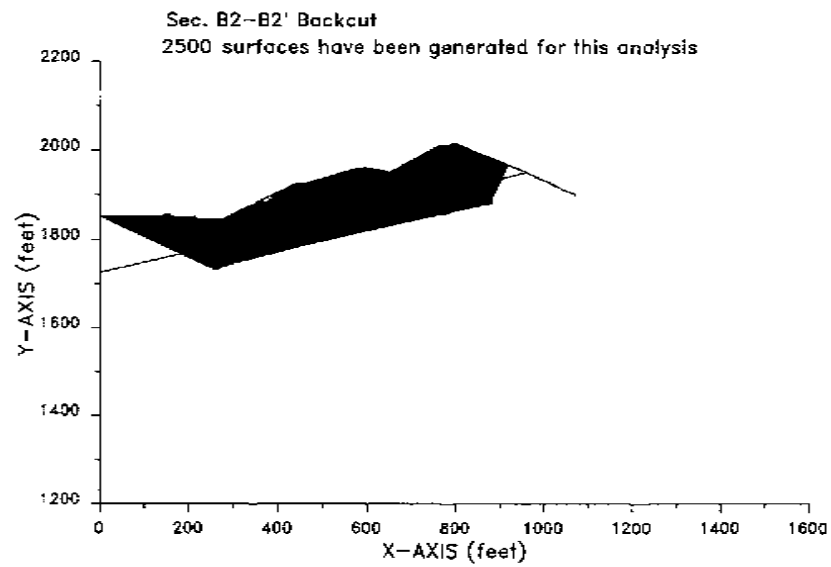
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. B2-B2' Backcut

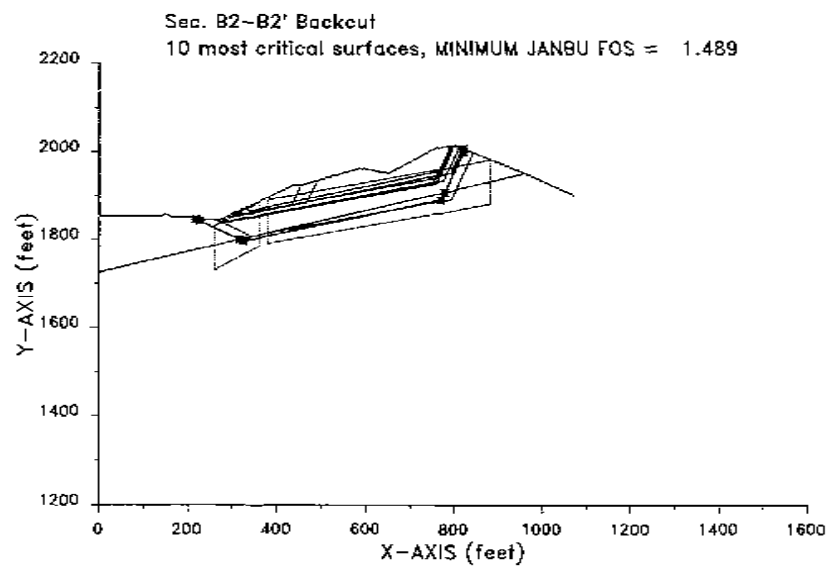
	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.489	1.062	217.47	819.74	2.161E+06
2.	1.492	1.067	289.91	485.48	2.820E+05
3.	1.500	1.052	259.59	786.67	1.172E+06
4.	1.513	1.043	328.16	791.28	7.431E+05
5.	1.523	1.049	277.52	807.06	1.206E+06
6.	1.524	1.078	310.65	451.24	2.111E+05
7.	1.533	1.054	275.82	795.38	1.247E+06
8.	1.541	1.040	308.72	814.21	9.525E+05
9.	1.546	1.050	305.86	790.39	9.361E+05
10.	1.550	1.060	259.93	838.79	2.066E+06

* * * END OF FILE * * *

8838B2B 11-14-** 14:59



8838B2B 11-14-** 14:59



W.O. 8838
Sec. B6-B6'

XSTABL File: 8838B6 11-22-** 9:24

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 À 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 À 1545   *
*****************************************
```

Problem Description : Sec. B6-B6' W=70'D=5/W=50'D=5'

SEGMENT BOUNDARY COORDINATES

12 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1662.0	90.0	1662.0	1
2	90.0	1662.0	285.0	1658.0	2
3	285.0	1658.0	301.0	1650.0	2
4	301.0	1650.0	380.0	1650.0	2
5	380.0	1650.0	525.0	1712.0	1
6	525.0	1712.0	545.0	1712.0	1
7	545.0	1712.0	790.0	1812.0	1
8	790.0	1812.0	1050.0	1920.0	3
9	1050.0	1920.0	1200.0	1950.0	3
10	1200.0	1950.0	1380.0	1950.0	3
11	1380.0	1950.0	1570.0	1840.0	3
12	1570.0	1840.0	1720.0	1775.0	2

8 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1640.0	90.0	1662.0	2
2	380.0	1650.0	380.1	1645.0	2
3	380.1	1645.0	450.0	1645.0	2
4	450.0	1645.0	545.0	1707.0	2
5	545.0	1707.0	595.0	1707.0	2
6	595.0	1707.0	710.0	1770.0	2
7	710.0	1770.0	790.0	1812.0	3
8	710.0	1770.0	1570.0	1840.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	135.0	200.0	34.00	.000	.0	1
2	130.0	140.0	200.0	40.00	.000	.0	1
3	130.0	140.0	225.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	f-value (degrees)
1	10.00	225.0	40.00
2	15.00	100.0	25.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	f-value (degrees)
1	5.00	225.0	40.00
2	10.00	100.0	25.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 6 coordinate points

PHREATIC SURFACE,

Point No.	x-water (ft)	y-water (ft)

GEOLABS-WESTLAKE VILLAGE

Plate B6.1

1	.00	1650.00
2	285.00	1658.00
3	301.00	1650.00
4	380.00	1650.00
5	396.00	1658.00
6	1500.00	1658.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	350.0	1600.0	525.0	1650.0	80.0
2	550.0	1650.0	1100.0	1850.0	100.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	365.86	1650.00
2	407.70	1630.49
3	974.61	1781.13
4	979.66	1791.95
5	1021.92	1882.58
6	1032.19	1904.50
7	1032.19	1912.50

** Corrected JANBU FOS = 1.601 ** (Fo factor = 1.057)

Failure surface No. 2 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	339.11	1650.00
2	386.48	1627.91
3	966.99	1782.20
4	971.21	1791.26
5	1013.47	1881.89
6	1022.11	1900.42
7	1022.11	1908.42

** Corrected JANBU FOS = 1.604 ** (Fo factor = 1.055)

Failure surface No. 3 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	379.57	1650.00
2	380.00	1649.77
3	388.98	1645.00
4	413.58	1633.53
5	974.76	1779.55
6	980.58	1792.02
7	1022.84	1882.65
8	1033.29	1905.06
9	1033.29	1913.06

** Corrected JANBU FOS = 1.613 ** (Fo factor = 1.058)

Failure surface No. 4 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	342.12	1650.00
2	404.73	1620.80
3	1015.19	1783.54
4	1020.67	1795.29
5	1062.93	1885.92
6	1077.67	1917.53
7	1077.67	1925.53

** Corrected JANBU FOS = 1.615 ** (Fo factor = 1.057)

Failure surface No. 5 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	327.76	1650.00
2	389.39	1621.26
3	1007.72	1783.03
4	1013.15	1794.67
5	1055.41	1885.31
6	1069.70	1915.94
7	1069.70	1923.94

** Corrected JANBU FOS = 1.623 ** (Fo factor = 1.056)

Failure surface No. 6 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	360.87	1650.00
2	394.57	1634.29
3	1028.06	1794.86
4	1028.55	1795.93
5	1070.81	1886.56
6	1086.04	1919.21
7	1086.04	1927.21

** Corrected JANBU FOS = 1.626 ** (Fo factor = 1.054)

Failure surface No. 7 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	333.36	1650.00
2	382.85	1626.92
3	1009.57	1786.11
4	1013.58	1794.71
5	1055.84	1885.34
6	1070.15	1916.03
7	1070.15	1924.03

** Corrected JANBU FOS = 1.627 ** (Fo factor = 1.056)

Failure surface No. 8 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	344.70	1650.00
2	379.94	1633.57
3	968.84	1785.28
4	971.64	1791.30
5	1013.90	1881.93
6	1022.62	1900.63
7	1022.62	1908.63

** Corrected JANBU FOS = 1.630 ** (Fo factor = 1.054)

Failure surface No. 9 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	361.31	1650.00
2	423.04	1621.22
3	1013.64	1777.30
4	1022.09	1795.40
5	1064.35	1886.03
6	1079.18	1917.84
7	1079.18	1925.84

** Corrected JANBU FOS = 1.633 ** (Fo factor = 1.059)

Failure surface No.10 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	373.82	1650.00
2	380.07	1646.68
3	383.22	1645.00
4	409.95	1632.54
5	1017.35	1783.46
6	1022.95	1795.47
7	1065.21	1886.10
8	1080.09	1918.02
9	1080.09	1926.02

** Corrected JANBU FOS = 1.637 ** (Fo factor = 1.058)

The following is a summary of the TEN most critical surfaces

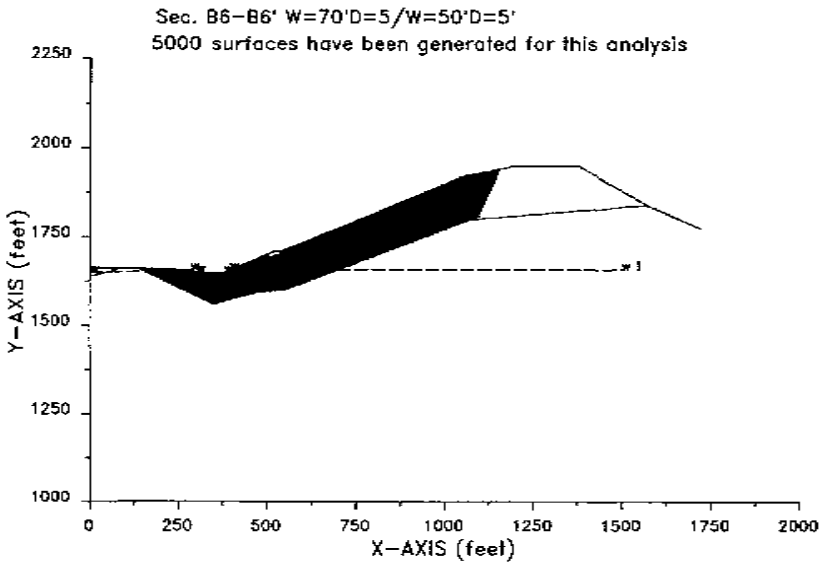
Problem Description : Sec. B6-B6' W=70'D=5/W=50'D=5'

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.601	1.057	365.86	1032.19	2.709E+06
2.	1.604	1.055	339.11	1022.11	2.559E+06
3.	1.613	1.058	379.57	1033.29	2.715E+06
4.	1.615	1.057	342.12	1077.67	3.416E+06
5.	1.623	1.056	327.76	1069.70	3.264E+06
6.	1.626	1.054	360.87	1086.04	3.004E+06
7.	1.627	1.056	333.36	1070.15	3.070E+06
8.	1.630	1.054	344.70	1022.62	2.410E+06
9.	1.633	1.059	361.31	1079.18	3.615E+06
10.	1.637	1.058	373.82	1080.09	3.229E+06

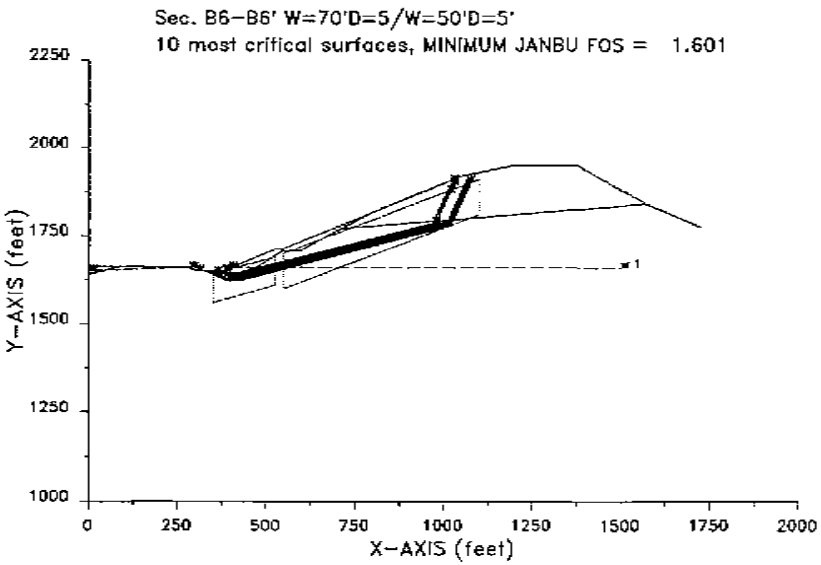
* * * END OF FILE * * *

W.O. 8838
Sec. B6-B6'

883886 11-22-** 9:24



883886 11-22-** 9:24



XSTABL File: 8838B6P 11-22-** 9:26

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 A 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Ã 1545  *
*****************************************
```

Problem Description : Sec. B6-B6' W=70'D=5/W=50'D=5' Pseud

SEGMENT BOUNDARY COORDINATES

12 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1662.0	90.0	1662.0	1
2	90.0	1662.0	285.0	1658.0	2
3	285.0	1658.0	301.0	1650.0	2
4	301.0	1650.0	380.0	1650.0	2
5	380.0	1650.0	525.0	1712.0	1
6	525.0	1712.0	545.0	1712.0	1
7	545.0	1712.0	790.0	1812.0	1
8	790.0	1812.0	1050.0	1920.0	3
9	1050.0	1920.0	1200.0	1950.0	3
10	1200.0	1950.0	1380.0	1950.0	3
11	1380.0	1950.0	1570.0	1840.0	3
12	1570.0	1840.0	1720.0	1775.0	2

8 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1640.0	90.0	1662.0	2
2	380.0	1650.0	380.1	1645.0	2
3	380.1	1645.0	450.0	1645.0	2
4	450.0	1645.0	545.0	1707.0	2
5	545.0	1707.0	595.0	1707.0	2
6	595.0	1707.0	710.0	1770.0	2
7	710.0	1770.0	790.0	1812.0	3
8	710.0	1770.0	1570.0	1840.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	135.0	200.0	34.00	.000	.0	1
2	130.0	140.0	200.0	40.00	.000	.0	1
3	130.0	140.0	225.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	15.00	100.0	25.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	5.00	225.0	40.00
2	10.00	100.0	25.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 6 coordinate points

PHREATIC SURFACE

Point No.	x-water (ft)	y-water (ft)

1	.00	1650.00
2	285.00	1658.00
3	301.00	1650.00
4	380.00	1650.00
5	396.00	1658.00
6	1500.00	1658.00

A horizontal earthquake loading coefficient
of .150 has been assigned

A vertical earthquake loading coefficient
of .000 has been assigned

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	350.0	1600.0	525.0	1650.0	80.0
2	550.0	1650.0	1100.0	1860.0	100.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	365.86	1650.00
2	407.70	1630.49
3	974.61	1781.13
4	979.66	1791.95
5	1021.92	1882.58
6	1032.19	1904.60
7	1032.19	1912.60

** Corrected JANBU FOS = 1.073 ** (Fo factor = 1.057)

Failure surface No. 2 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	339.11	1650.00
2	386.48	1627.91
3	966.99	1782.20
4	971.21	1791.26
5	1013.47	1881.89
6	1022.11	1900.42
7	1022.11	1908.42

** Corrected JANBU FOS = 1.074 ** (Fo factor = 1.055)

Failure surface No. 3 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	379.57	1650.00
2	380.00	1649.77
3	388.98	1645.00
4	413.58	1633.53
5	974.76	1779.55
6	980.58	1792.02
7	1022.84	1882.65
8	1033.29	1905.06
9	1033.29	1913.06

** Corrected JANBU FOS = 1.080 ** (Fo factor = 1.058)

Failure surface No. 4 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	342.12	1650.00
2	404.73	1620.80
3	1015.19	1783.54
4	1020.67	1795.29
5	1062.93	1885.92
6	1077.67	1917.53
7	1077.67	1925.53

** Corrected JANBU FOS = 1.082 ** (Fo factor = 1.057)

Failure surface No. 5 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	360.87	1650.00
2	394.57	1634.29
3	1028.06	1794.86
4	1028.55	1795.93
5	1070.81	1886.56
6	1086.04	1919.21
7	1086.04	1927.21

** Corrected JANBU FOS = 1.083 ** (Fo factor = 1.054)

Failure surface No. 6 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)

1	327.76	1650.00
2	389.39	1621.26
3	1007.72	1783.03
4	1013.15	1794.67
5	1055.41	1885.31
6	1069.70	1915.94
7	1069.70	1923.94

** Corrected JANBU FOS = 1.085 ** (Fo factor = 1.056)

Failure surface No. 7 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	333.36	1650.00
2	382.85	1626.92
3	1009.57	1786.11
4	1013.58	1794.71
5	1055.84	1885.34
6	1070.15	1916.03
7	1070.15	1924.03

** Corrected JANBU FOS = 1.085 ** (Fo factor = 1.056)

Failure surface No. 8 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	344.70	1650.00
2	379.94	1633.57
3	968.84	1785.28
4	971.64	1791.30
5	1013.90	1881.93
6	1022.62	1900.63
7	1022.62	1908.63

** Corrected JANBU FOS = 1.089 ** (Fo factor = 1.054)

Failure surface No. 9 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	373.82	1650.00
2	380.07	1646.68
3	383.22	1645.00
4	409.95	1632.54
5	1017.35	1783.46
6	1022.95	1795.47
7	1065.21	1886.10
8	1080.09	1918.02
9	1080.09	1926.02

** Corrected JANBU FOS = 1.091 ** (Fo factor = 1.058)

Failure surface No.10 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	377.60	1650.00
2	380.03	1648.71
3	387.01	1645.00
4	404.12	1637.02
5	967.45	1777.46
6	973.99	1791.49
7	1016.25	1882.12
8	1025.42	1901.79
9	1025.42	1909.79

** Corrected JANBU FOS = 1.093 ** (Fo factor = 1.058)

The following is a summary of the TEN most critical surfaces

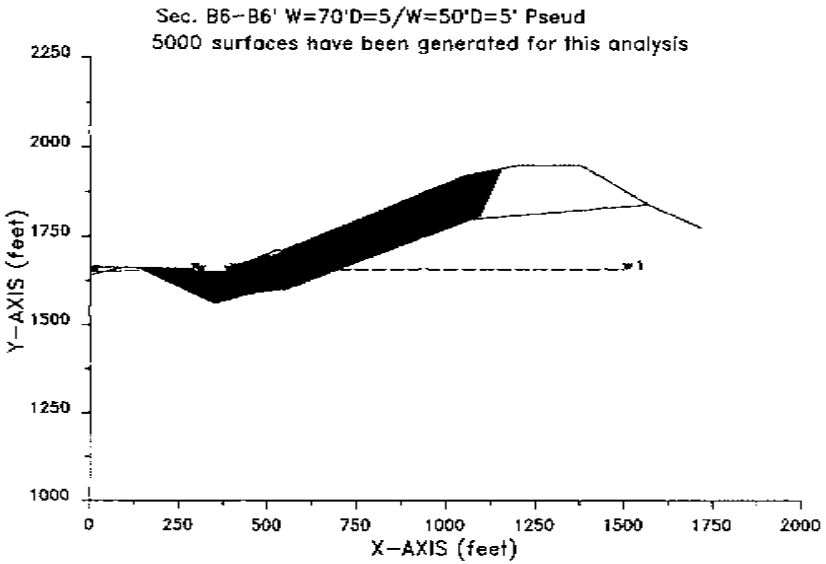
Problem Description : Sec. B6-B6' W=70'D=5/W=50'D=5' Pseud

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.073	1.057	365.86	1032.19	2.559E+06
2.	1.074	1.055	339.11	1022.11	2.418E+06
3.	1.080	1.058	379.57	1033.29	2.561E+06
4.	1.082	1.057	342.12	1077.67	3.236E+06
5.	1.083	1.054	360.87	1086.04	2.830E+06
6.	1.085	1.056	327.76	1069.70	3.089E+06
7.	1.085	1.056	333.36	1070.15	2.897E+06
8.	1.089	1.054	344.70	1022.62	2.271E+06
9.	1.091	1.058	373.82	1080.09	3.043E+06
10.	1.093	1.058	377.60	1025.42	2.434E+06

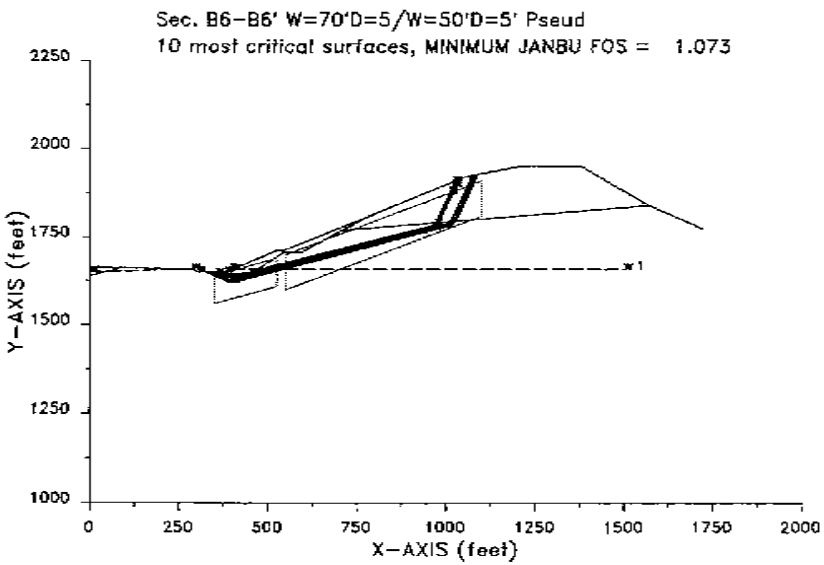
* * * END OF FILE * * *

W.O. 8838
Sec. B6-B6' Pseudostatic

8838B6P 11-22-** 9:26



8838B6P 11-22-** 9:26



W.O. 8838

Sec. B6-B6' Pseudo. Spencer's

XSTABL File: 883836PS 11-22-** 9:26

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Â 1545  *
*****************************************
```

Problem Description : Sec. B6-B6' W=70'D=5/W=50'D=5' PsSpe

SEGMENT BOUNDARY COORDINATES

12 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1662.0	90.0	1662.0	1
2	90.0	1662.0	285.0	1658.0	2
3	285.0	1658.0	301.0	1650.0	2
4	301.0	1650.0	380.0	1650.0	2
5	380.0	1650.0	525.0	1712.0	1
6	525.0	1712.0	545.0	1712.0	1
7	545.0	1712.0	790.0	1812.0	1
8	790.0	1812.0	1050.0	1920.0	3
9	1050.0	1920.0	1200.0	1950.0	3
10	1200.0	1950.0	1380.0	1950.0	3
11	1380.0	1950.0	1570.0	1840.0	3
12	1570.0	1840.0	1720.0	1775.0	2

8 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1640.0	90.0	1662.0	2
2	380.0	1650.0	380.1	1645.0	2
3	380.1	1645.0	450.0	1645.0	2
4	450.0	1645.0	545.0	1707.0	2
5	545.0	1707.0	595.0	1707.0	2
6	595.0	1707.0	710.0	1770.0	2
7	710.0	1770.0	790.0	1812.0	3
8	710.0	1770.0	1570.0	1840.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	135.0	200.0	34.00	.000	.0	1
2	130.0	140.0	200.0	40.00	.000	.0	1
3	130.0	140.0	225.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	15.00	100.0	25.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	5.00	225.0	40.00
2	10.00	100.0	25.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 6 coordinate points

```
**********************************
        PHREATIC SURFACE,
**********************************
```

Point No.	x-water (ft)	y-water (ft)

GEOLABS-WESTLAKE VILLAGE

Plate B6ps.1

1	.00	1650.00
2	285.00	1658.00
3	301.00	1650.00
4	380.00	1650.00
5	396.00	1658.00
6	1500.00	1658.00

A horizontal earthquake loading coefficient
of .150 has been assigned

A vertical earthquake loading coefficient
of .000 has been assigned

A SINGLE FAILURE SURFACE HAS BEEN SPECIFIED FOR ANALYSIS

Trial failure surface specified by
the following 8 coordinate points :

Point No.	x-surf (ft)	y-surf (ft)
1	365.86	1650.00
2	407.70	1630.49
3	974.61	1781.13
4	979.66	1791.95
5	1021.92	1882.58
6	1032.19	1904.60
7	1032.19	1904.60
8	1032.19	1912.60

****
SELECTED METHOD OF ANALYSIS: Spencer (1973)
****

****
SUMMARY OF INDIVIDUAL SLICE INFORMATION
****

Slice	x-base (ft)	y-base (ft)	height (ft)	width (ft)	alpha	beta	weight (lb)
1	372.93	1646.70	3.30	14.14	-25.00	.00	6526.
2	380.05	1643.38	6.64	.10	-25.00	23.15	92.
3	389.05	1639.65	13.79	15.90	-25.00	23.15	30024.
4	401.85	1633.22	26.12	11.70	-25.00	23.15	41796.
5	428.85	1636.11	34.78	42.30	14.88	23.15	195026.
6	480.61	1649.86	43.16	61.23	14.88	23.15	339916.
7	518.11	1659.83	49.23	13.77	14.88	23.15	86773.
8	535.00	1664.32	47.68	20.00	14.88	.00	122825.
9	570.00	1673.62	48.59	50.00	14.88	22.20	312018.
10	652.50	1695.54	60.34	115.00	14.88	22.20	892076.
11	750.00	1721.45	74.23	80.00	14.88	22.20	770092.
12	882.30	1756.60	93.74	184.61	14.88	22.56	2249679.
13	977.14	1786.54	103.19	5.05	64.98	22.56	67746.
14	1000.79	1837.26	62.29	42.26	65.00	22.56	342231.
15	1027.05	1893.59	16.88	10.27	65.00	22.56	22535.

ITERATIONS FOR SPENCER'S METHOD

Iter #	Theta	FOS_force	FOS_moment
2	25.6036	1.2386	1.1571
3	22.9147	-----	1.2386
3	24.2591	1.2077	-----
4	23.7545	1.1972	1.2077
5	24.0828	-----	1.1972
5	23.9186	1.2006	-----
6	23.9753	1.2017	1.2006
7	23.9569	1.2014	1.2017

SLICE INFORMATION ... continued :

Slice	Sigma (psf)	c-value (psf)	phi	U-base (lb)	U-top (lb)	P-top (lb)	Delta
1	2794.4	225.0	40.00	3210.	0.	0.	.00
2	4869.1	225.0	40.00	37.	0.	0.	.00
3	8974.7	225.0	40.00	12587.	629.	0.	.00
4	14530.9	225.0	40.00	19963.	0.	0.	.00
5	2661.2	100.0	25.00	59784.	0.	0.	.00
6	4413.6	100.0	25.00	32160.	0.	0.	.00
7	5622.2	100.0	25.00	0.	0.	0.	.00
8	5479.7	100.0	25.00	0.	0.	0.	.00
9	5567.9	100.0	25.00	0.	0.	0.	.00
10	6917.8	100.0	25.00	0.	0.	0.	.00
11	8581.1	100.0	25.00	0.	0.	0.	.00
12	10859.4	100.0	25.00	0.	0.	0.	.00
13	3888.7	225.0	40.00	0.	0.	0.	.00
14	2305.5	225.0	40.00	0.	0.	0.	.00
15	557.2	225.0	40.00	0.	0.	0.	.00

SPENCER'S (1973) - TOTAL Stresses at center of slice base

Slice #	Base x-coord (ft)	Normal Stress (psf)	Vertical Stress (psf)	Pore Water Pressure (psf)	Shear Stress (psf)
1	372.93	3000.1	461.5	205.7	2138.9
2	380.05	5200.7	917.0	331.6	3587.9
3	388.05	9692.2	1924.7	717.5	6435.3
4	401.85	16077.3	3572.3	1546.4	10335.8
5	428.85	4027.1	4610.5	1365.9	1116.1
6	480.61	4921.3	5551.5	507.6	1796.3
7	518.11	5622.2	6301.4	.0	2265.3
8	535.00	5479.7	6141.3	.0	2210.0
9	570.00	5567.9	6240.4	.0	2244.3
10	652.50	6917.8	7757.2	.0	2768.2
11	750.00	8581.1	9626.1	.0	3413.8
12	882.30	10859.4	12186.1	.0	4298.0
13	977.14	3888.7	13415.1	.0	2903.2
14	1000.79	2305.5	8098.2	.0	1797.4
15	1027.05	557.2	2194.3	.0	576.4

SPENCER'S (1973) - Magnitude & Location of Interslice Forces

Slice #	Right x-coord (ft)	Force Angle (degrees)	Interslice Force (lb)	Force Height (ft)	Boundary Height (ft)	Height Ratio
1	380.00	23.96	53670.	6.40	6.59	.971
2	380.10	23.96	54313.	6.42	6.68	.960
3	396.00	23.96	240604.	10.19	20.90	.488

W.O. 8838

Sec. B6-B6' Pseudo. Spencer's

4	407.70	23.96	462054.	13.21	31.35	.421
5	450.00	23.96	432172.	20.66	38.20	.541
6	511.23	23.96	409114.	30.16	48.11	.627
7	525.00	23.96	406494.	31.96	50.34	.635
8	545.00	23.96	402834.	34.65	45.03	.770
9	595.00	23.96	393461.	41.37	52.15	.793
10	710.00	23.96	364064.	54.02	68.53	.788
11	790.00	23.96	336895.	59.35	79.92	.743
12	974.61	23.96	252960.	49.13	107.55	.457
13	979.66	23.96	211842.	46.54	98.83	.471
14	1021.92	23.96	10145.	11.69	25.76	.454
15	1032.19	.00	-460.	.15	8.00	.018

AVERAGE VALUES ALONG FAILURE SURFACE

Total Normal Stress = 7049.07 (psf)
Pore Water Pressure = 166.12 (psf)
Shear Stress = 3068.03 (psf)

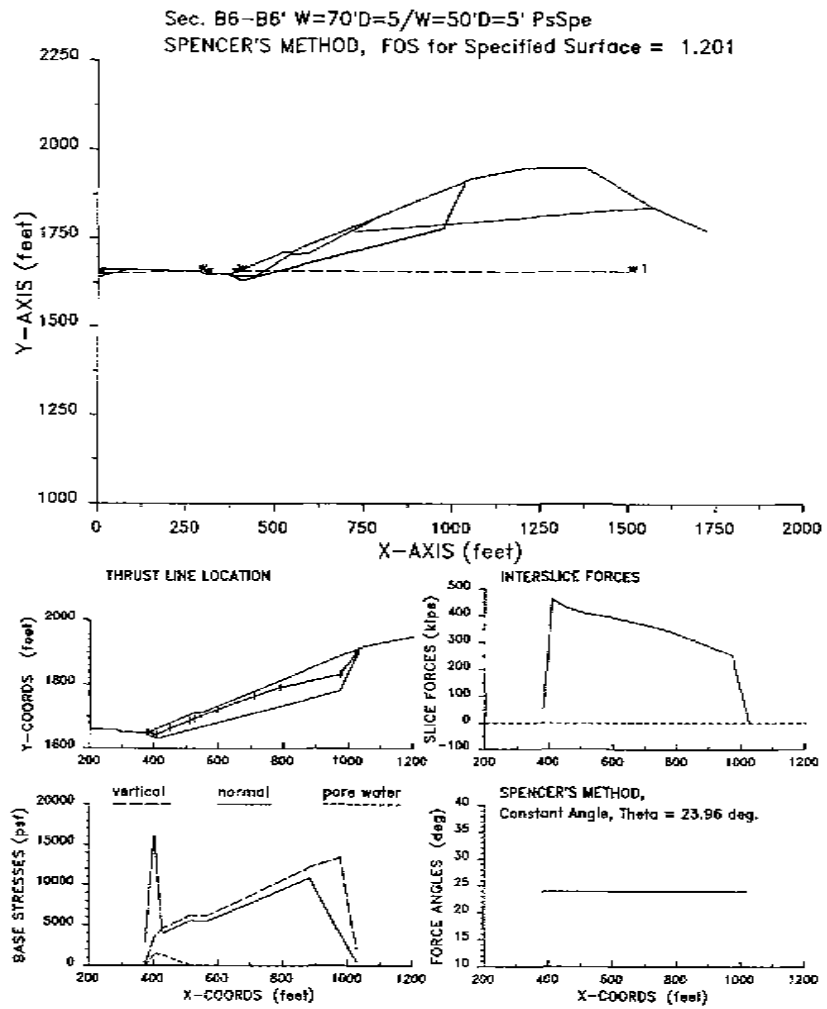
Total Length of failure surface = 768.98 feet

For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S (1973) procedure gives a

FACTOR OF SAFETY = 1.201

Total shear strength available along specified failure surface = 276.16E+04 lb

B83886PS 11-22-** 9:26



Sec. B6-B6' W=70'D=5/W=50'D=5' PsSpe
SPENCER'S METHOD, FOS for Specified Surface = 1.201

W.O. 8838
Sec. B6-B6' Backcut

XSTABL File: 883836B 11-22-** 9:32

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Ä 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Ä 1545  *
*****************************************
```

Problem Description : Sec. B6-B6' Backcut

SEGMENT BOUNDARY COORDINATES

15 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1662.0	90.0	1662.0	1
2	90.0	1662.0	285.0	1658.0	2
3	285.0	1658.0	301.0	1650.0	2
4	301.0	1650.0	380.0	1650.0	2
5	380.0	1650.0	380.1	1645.0	2
6	380.1	1645.0	450.0	1645.0	2
7	450.0	1645.0	545.0	1707.0	2
8	545.0	1707.0	595.0	1707.0	2
9	595.0	1707.0	710.0	1770.0	2
10	710.0	1770.0	790.0	1812.0	3
11	790.0	1812.0	1050.0	1920.0	3
12	1050.0	1920.0	1200.0	1950.0	3
13	1200.0	1950.0	1380.0	1950.0	3
14	1380.0	1950.0	1570.0	1840.0	3
15	1570.0	1840.0	1720.0	1775.0	2

2 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1640.0	90.0	1662.0	2
2	710.0	1770.0	1570.0	1840.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 [feet]
Maximum depth of water in crack = .00 [feet]
Unit weight of water in crack = 62.40 [pcf]

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil Unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	135.0	200.0	34.00	.000	.0	0
2	130.0	140.0	200.0	40.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	225.0	40.00
2	15.00	100.0	25.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	5.00	225.0	40.00
2	10.00	100.0	25.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

W.O. 8838
Sec. B6-B6' Backcut

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	445.0	1600.0	530.0	1650.0	80.0
2	600.0	1650.0	1100.0	1860.0	100.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	454.49	1647.93
2	461.77	1644.53
3	754.97	1721.41
4	780.30	1775.72
5	794.33	1805.80
6	794.33	1813.80

** Corrected JANBU FOS = 1.502 ** (Fo factor = 1.066)

Failure surface No. 2 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	456.24	1649.07
2	465.65	1644.69
3	872.24	1753.56
4	886.61	1784.38
5	921.17	1858.49
6	921.17	1866.49

** Corrected JANBU FOS = 1.502 ** (Fo factor = 1.062)

Failure surface No. 3 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	463.44	1653.77
2	467.46	1651.90
3	771.78	1730.16
4	793.53	1776.80
5	810.11	1812.35
6	810.11	1820.35

** Corrected JANBU FOS = 1.505 ** (Fo factor = 1.064)

Failure surface No. 4 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	482.85	1666.44
2	490.88	1662.69
3	818.83	1750.26
4	832.70	1779.99
5	856.84	1831.76
6	856.84	1839.76

** Corrected JANBU FOS = 1.512 ** (Fo factor = 1.062)

Failure surface No. 5 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	429.82	1645.00
2	449.31	1635.92
3	895.55	1754.95
4	910.17	1786.29
5	949.28	1870.16
6	949.28	1878.16

** Corrected JANBU FOS = 1.513 ** (Fo factor = 1.062)

Failure surface No. 6 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	467.43	1656.37
2	477.00	1651.91
3	951.08	1778.64
4	956.40	1790.06
5	998.66	1880.69
6	1004.44	1893.08
7	1004.44	1901.08

** Corrected JANBU FOS = 1.513 ** (Fo factor = 1.060)

Failure surface No. 7 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	456.41	1649.19
2	471.68	1642.07
3	870.70	1748.90
4	887.27	1784.43
5	921.95	1858.81
6	921.95	1866.81

** Corrected JANBU FOS = 1.516 ** (Fo factor = 1.064)

Failure surface No. 8 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	425.61	1645.00
2	445.43	1635.76
3	778.29	1722.80
4	803.86	1777.64
5	822.43	1817.47
6	822.43	1825.47

** Corrected JANBU FOS = 1.519 ** (Fo factor = 1.065)

W.O. 8838
Sec. B6-B6' Backcut

Failure surface No. 9 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	456.88	1649.49
2	473.47	1641.76
3	815.46	1733.07
4	837.52	1780.38
5	862.60	1834.16
6	862.60	1842.16

** Corrected JANBU FOS = 1.521 ** (Fo factor = 1.066)

Failure surface No.10 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	491.81	1672.28
2	496.57	1670.06
3	835.64	1759.01
4	845.92	1781.06
5	872.62	1838.32
6	872.62	1846.32

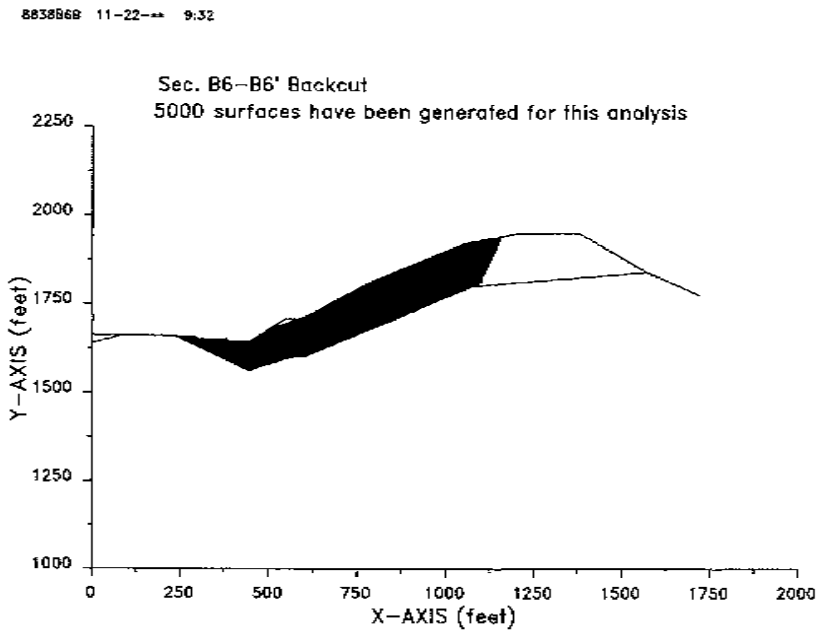
** Corrected JANBU FOS = 1.522 ** (Fo factor = 1.060)

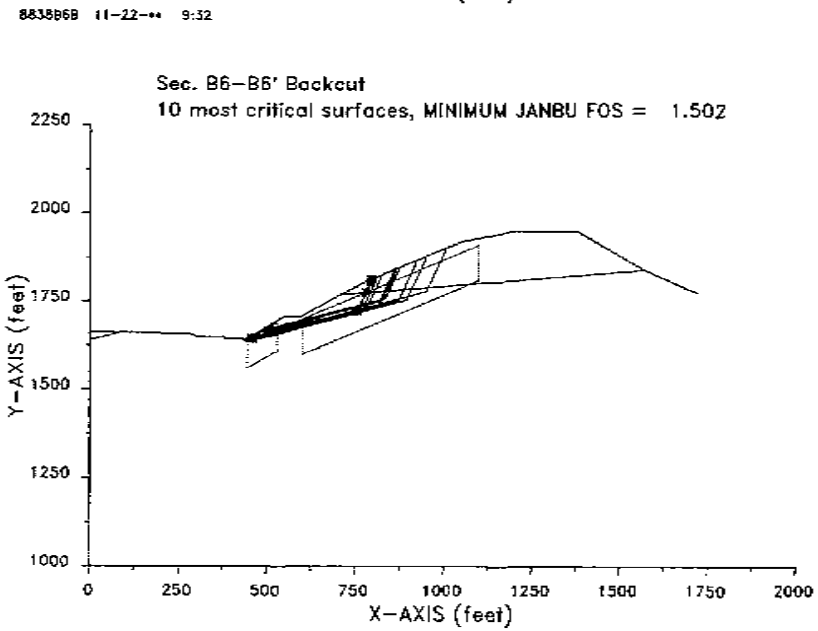
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. B6-B6' Backcut

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.502	1.066	454.49	794.33	9.033E+05
2.	1.502	1.062	456.24	921.17	1.583E+06
3.	1.505	1.064	463.44	810.11	8.765E+05
4.	1.512	1.062	482.85	856.84	9.622E+05
5.	1.513	1.062	429.82	949.28	1.905E+06
6.	1.513	1.060	467.43	1004.44	1.970E+06
7.	1.516	1.064	456.41	921.95	1.711E+06
8.	1.519	1.065	425.61	822.43	1.170E+06
9.	1.521	1.066	456.88	862.60	1.386E+06
10.	1.522	1.060	491.81	872.62	9.214E+05

* * * END OF FILE * * *





W.O. 8838
Sec. C-C' W=110' D=5'

XSTABL File: 8838C 11-13-** 12:22

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*         All Rights Reserved           *
*                                       *
* Ver. 5.201                96 Â 1545   *
*****************************************
```

Problem Description : Sec. C-C' W=110' D=5'

SEGMENT BOUNDARY COORDINATES

9 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1936.0	280.0	1943.0	1
2	280.0	1943.0	355.0	1975.0	1
3	355.0	1975.0	365.0	1975.0	1
4	365.0	1975.0	381.0	1962.0	1
5	381.0	1962.0	510.0	1962.0	1
6	510.0	1962.0	530.0	1962.0	2
7	530.0	1962.0	725.0	2040.0	1
8	725.0	2040.0	800.0	2025.0	1
9	800.0	2025.0	1015.0	1985.0	2

8 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1875.0	280.0	1938.0	2
2	280.0	1938.0	310.0	1938.0	2
3	310.0	1938.0	381.0	1957.0	2
4	381.0	1957.0	509.0	1957.0	2
5	509.0	1957.0	510.0	1962.0	2
6	530.0	1962.0	530.1	1957.0	2
7	530.1	1957.0	640.0	1957.0	2
8	640.0	1957.0	800.0	2025.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	130.0	200.0	34.00	.000	.0	0
2	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	f-value (degrees)
1	21.00	225.0	40.00
2	24.00	150.0	11.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	560.0	1930.0	670.0	1950.0	50.0
2	730.0	2010.0	900.0	1980.0	50.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

W.O. 8838
Sec. C-C' W=110' D=5'

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	500.72	1962.00
2	509.11	1957.54
3	572.94	1927.77
4	789.74	2019.05
5	789.74	2027.05

** Corrected JANBU FOS = 1.609 ** (Fo factor = 1.064)

Failure surface No. 2 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	524.35	1962.00
2	530.06	1958.96
3	533.75	1957.00
4	585.90	1932.68
5	793.80	2018.24
6	793.80	2026.24

** Corrected JANBU FOS = 1.610 ** (Fo factor = 1.061)

Failure surface No. 3 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	532.70	1963.08
2	544.14	1957.00
3	589.53	1935.83
4	797.61	2017.48
5	797.61	2025.48

** Corrected JANBU FOS = 1.611 ** (Fo factor = 1.058)

Failure surface No. 4 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	497.22	1962.00
2	506.62	1957.00
3	568.34	1928.22
4	746.93	1997.43
5	749.84	2003.68
6	761.07	2024.79
7	761.07	2032.79

** Corrected JANBU FOS = 1.631 ** (Fo factor = 1.069)

Failure surface No. 5 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	510.93	1962.00
2	582.29	1928.72
3	777.63	2014.88
4	777.98	2015.64
5	780.75	2020.85
6	780.75	2028.85

** Corrected JANBU FOS = 1.643 ** (Fo factor = 1.067)

Failure surface No. 6 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	498.12	1962.00
2	507.53	1957.00
3	570.23	1927.76
4	738.52	1994.77
5	740.91	1999.89
6	754.81	2026.04
7	754.81	2034.04

** Corrected JANBU FOS = 1.649 ** (Fo factor = 1.071)

Failure surface No. 7 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	539.28	1965.71
2	555.66	1957.00
3	596.76	1937.84
4	761.58	2007.35
5	762.34	2009.00
6	769.81	2023.04
7	769.81	2031.04

** Corrected JANBU FOS = 1.655 ** (Fo factor = 1.067)

Failure surface No. 8 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	502.94	1962.00
2	509.32	1958.61
3	573.96	1928.47
4	732.95	1992.45
5	735.31	1997.51
6	750.89	2026.82
7	750.89	2034.82

** Corrected JANBU FOS = 1.659 ** (Fo factor = 1.072)

Failure surface No. 9 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	511.62	1962.00
2	579.52	1930.34
3	730.21	1990.46
4	733.05	1996.55
5	749.31	2027.14
6	749.31	2035.14

** Corrected JANBU FOS = 1.667 ** (Fo factor = 1.072)

W.O. 8838
Sec. C-C' W=110' D=5'

Failure surface No.10 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	500.68	1962.00
2	509.10	1957.52
3	578.89	1924.98
4	792.66	2018.47
5	792.66	2026.47

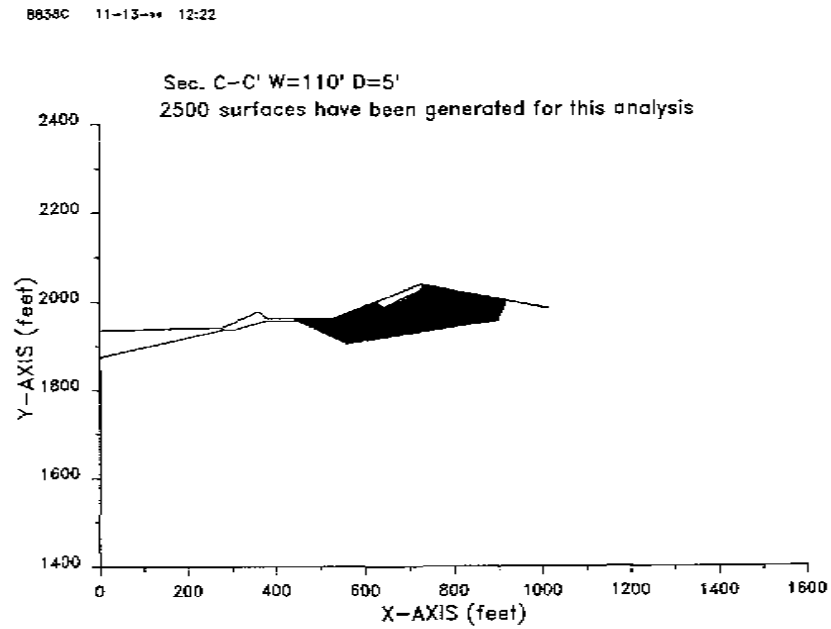
** Corrected JANBU FOS = 1.686 ** (Fc factor = 1.067)

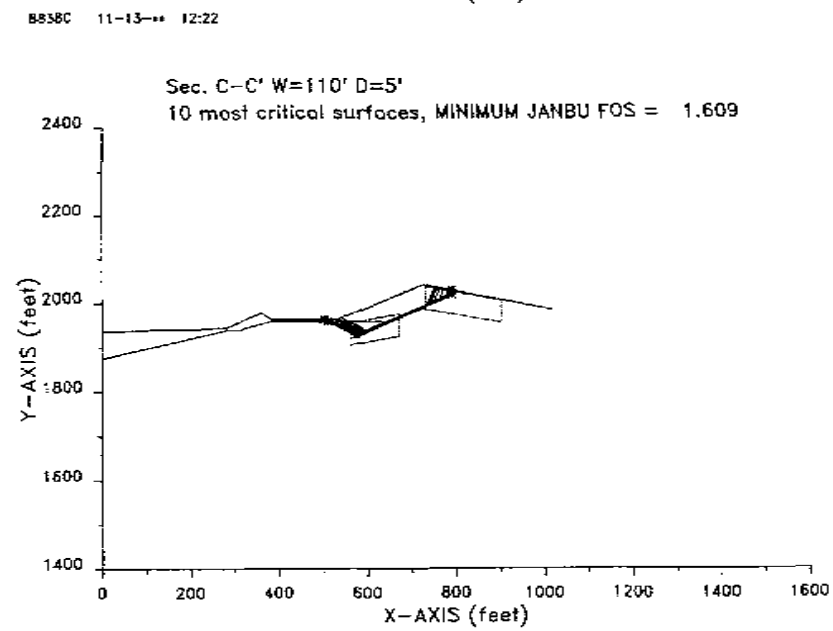
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. C-C' W=110' D=5'

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.609	1.064	500.72	789.74	5.525E+05
2.	1.610	1.061	524.35	793.80	5.245E+05
3.	1.611	1.058	532.70	797.61	4.999E+05
4.	1.631	1.069	497.22	761.07	5.490E+05
5.	1.643	1.067	510.93	780.75	5.600E+05
6.	1.649	1.071	498.12	754.81	5.569E+05
7.	1.655	1.067	539.28	769.81	4.811E+05
8.	1.659	1.072	502.94	750.89	5.558E+05
9.	1.667	1.072	511.62	749.31	5.469E+05
10.	1.686	1.067	500.68	792.66	6.148E+05

* * * END OF FILE * * *





W.O. 8838
Sec. C-C' Pseudo

XSTABL File: 8838CP 11-13-** 12:23

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Ä 96        *
*   Interactive Software Designs, Inc.  *
*       Moscow, ID 83843, U.S.A.        *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Ä 1545  *
*****************************************
```

Problem Description : Sec. C-C' W=110' D=5' Pseudo

SEGMENT BOUNDARY COORDINATES

9 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1936.0	280.0	1943.0	1
2	280.0	1943.0	355.0	1975.0	1
3	355.0	1975.0	365.0	1975.0	1
4	365.0	1975.0	381.0	1962.0	1
5	381.0	1962.0	510.0	1962.0	1
6	510.0	1962.0	530.0	1962.0	2
7	530.0	1962.0	725.0	2040.0	1
8	725.0	2040.0	800.0	2025.0	1
9	800.0	2025.0	1015.0	1985.0	2

8 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1875.0	280.0	1938.0	2
2	280.0	1938.0	310.0	1938.0	2
3	310.0	1938.0	381.0	1957.0	2
4	381.0	1957.0	509.0	1957.0	2
5	509.0	1957.0	510.0	1962.0	2
6	530.0	1962.0	530.1	1957.0	2
7	530.1	1957.0	640.0	1957.0	2
8	640.0	1957.0	800.0	2025.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	130.0	200.0	34.00	.000	.0	0
2	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	21.00	225.0	40.00
2	24.00	150.0	11.00
3	90.00	225.0	40.00

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	560.0	1930.0	670.0	1950.0	50.0

W.O. 8838
Sec. C-C' Pseudo

2	730.0	2010.0	900.0	1980.0	50.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	532.70	1963.08
2	544.14	1957.00
3	589.53	1935.83
4	797.61	2017.48
5	797.61	2025.48

** Corrected JANBU FOS = 1.120 ** (Fo factor = 1.058)

Failure surface No. 2 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	524.35	1962.00
2	530.06	1958.96
3	533.75	1957.00
4	585.90	1932.68
5	793.80	2018.24
6	793.80	2026.24

** Corrected JANBU FOS = 1.133 ** (Fo factor = 1.061)

Failure surface No. 3 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	500.72	1962.00
2	509.11	1957.54
3	572.94	1927.77
4	789.74	2019.05
5	789.74	2027.05

** Corrected JANBU FOS = 1.139 ** (Fo factor = 1.064)

Failure surface No. 4 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	497.22	1962.00
2	506.62	1957.00
3	568.34	1928.22
4	746.93	1997.43
5	749.84	2003.68
6	761.07	2024.79
7	761.07	2032.79

** Corrected JANBU FOS = 1.152 ** (Fo factor = 1.069)

Failure surface No. 5 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	539.28	1965.71
2	555.66	1957.00
3	596.76	1937.84
4	761.58	2007.35
5	762.34	2009.00
6	769.81	2023.04
7	769.81	2031.04

** Corrected JANBU FOS = 1.171 ** (Fo factor = 1.067)

Failure surface No. 6 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	510.93	1962.00
2	582.29	1928.72
3	777.63	2014.88
4	777.98	2015.64
5	780.75	2020.85
6	780.75	2028.85

** Corrected JANBU FOS = 1.172 ** (Fo factor = 1.067)

Failure surface No. 7 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	498.12	1962.00
2	507.53	1957.00
3	570.23	1927.76
4	738.52	1994.77
5	740.91	1999.89
6	754.81	2026.04
7	754.81	2034.04

** Corrected JANBU FOS = 1.175 ** (Fo factor = 1.071)

Failure surface No. 8 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	526.02	1962.00
2	530.04	1959.86
3	535.42	1957.00
4	591.81	1930.71
5	797.96	2017.41
6	797.96	2025.41

** Corrected JANBU FOS = 1.182 ** (Fo factor = 1.063)

Failure surface No. 9 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	496.27	1962.00

2	505.67	1957.00
3	572.39	1925.89
4	757.60	1999.33
5	762.04	2008.87
6	769.60	2023.08
7	769.60	2031.08

** Corrected JANBU FOS = 1.185 ** (Fo factor = 1.070)

Failure surface No.10 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	502.94	1962.00
2	509.32	1958.61
3	573.96	1928.47
4	732.95	1992.45
5	735.31	1997.51
6	750.89	2026.82
7	750.89	2034.82

** Corrected JANBU FOS = 1.189 ** (Fo factor = 1.072)

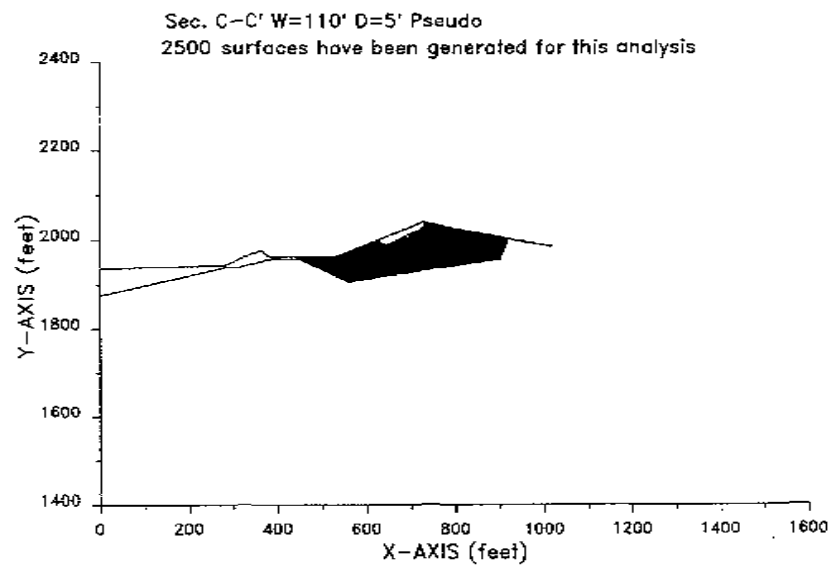
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. C-C' W=110' D=5' Pseudo

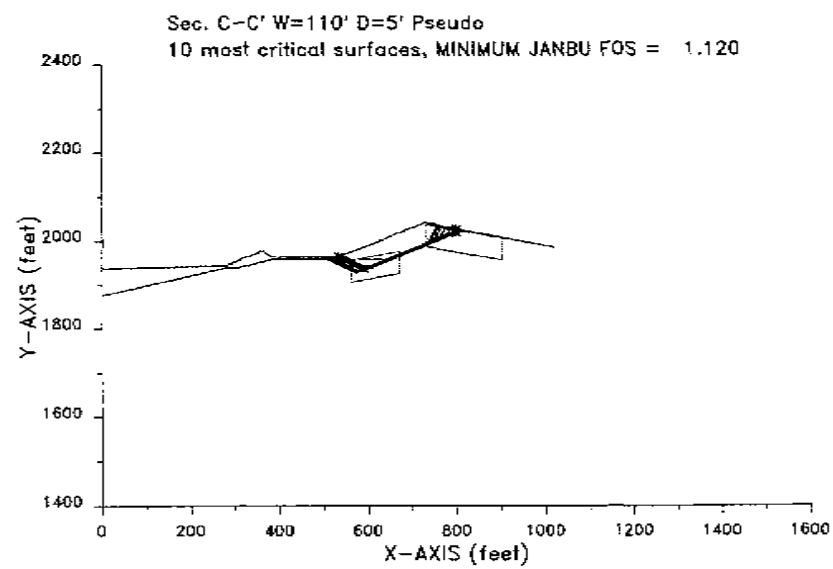
	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.120	1.058	532.70	797.61	5.380E+05
2.	1.133	1.061	524.35	793.80	5.646E+05
3.	1.139	1.064	500.72	789.74	5.944E+05
4.	1.152	1.069	497.22	761.07	5.822E+05
5.	1.171	1.067	539.28	769.81	5.136E+05
6.	1.172	1.067	510.93	780.75	6.014E+05
7.	1.175	1.071	498.12	754.81	5.887E+05
8.	1.182	1.063	526.02	797.96	6.196E+05
9.	1.185	1.070	496.27	769.60	6.382E+05
10.	1.189	1.072	502.94	750.89	5.858E+05

* * * END OF FILE * * *

8838CP 11-13-** 12:23



8838CP 11-13-** 12:23



W.O. 8838
Sec. C-C' Backcut

XSTABL File: 8838CB 11-13-** 12:21

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*       Moscow, ID 83843, U.S.A.        *
*                                       *
*         All Rights Reserved           *
*                                       *
*  Ver. 5.201                96 Â 1545  *
*****************************************
```

Problem Description : Sec. C-C' Backcut

SEGMENT BOUNDARY COORDINATES

10 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1936.0	280.0	1943.0	1
2	280.0	1943.0	355.0	1975.0	1
3	355.0	1975.0	365.0	1975.0	1
4	365.0	1975.0	381.0	1962.0	1
5	381.0	1962.0	510.0	1962.0	1
6	510.0	1962.0	530.0	1962.0	2
7	530.0	1962.0	530.1	1957.0	2
8	530.1	1957.0	640.0	1957.0	2
9	640.0	1957.0	800.0	2025.0	2
10	800.0	2025.0	1015.0	1985.0	2

5 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1875.0	280.0	1938.0	2
2	280.0	1938.0	310.0	1938.0	2
3	310.0	1938.0	381.0	1958.0	2
4	381.0	1958.0	509.0	1958.0	2
5	509.0	1958.0	510.0	1962.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	130.0	200.0	34.00	.000	.0	0
2	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	21.00	225.0	40.00
2	24.00	150.0	11.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	640.0	1930.0	710.0	1960.0	50.0
2	795.0	1995.0	940.0	1970.0	50.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

W.O. 8838
Sec. C-C' Backcut

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	653.83	1962.88
2	671.86	1954.47
3	812.09	2011.86
4	813.33	2014.52
5	813.33	2022.52

** Corrected JANBU FOS = 1.113 ** (Fo factor = 1.037)

Failure surface No. 2 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	654.14	1963.01
2	673.07	1954.18
3	804.92	2008.95
4	807.98	2015.52
5	807.98	2023.52

** Corrected JANBU FOS = 1.135 ** (Fo factor = 1.040)

Failure surface No. 3 specified by 4 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	676.03	1972.31
2	687.41	1967.01
3	804.63	2016.14
4	804.63	2024.14

** Corrected JANBU FOS = 1.139 ** (Fo factor = 1.030)

Failure surface No. 4 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	656.55	1964.03
2	675.44	1955.22
3	800.17	2006.47
4	804.67	2016.13
5	804.67	2024.13

** Corrected JANBU FOS = 1.149 ** (Fo factor = 1.041)

Failure surface No. 5 specified by 4 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	640.66	1957.28
2	646.15	1954.72
3	789.17	2012.40
4	789.17	2020.40

** Corrected JANBU FOS = 1.154 ** (Fo factor = 1.021)

Failure surface No. 6 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	661.07	1965.95
2	678.98	1957.60
3	797.83	2004.40
4	803.41	2016.37
5	803.41	2024.37

** Corrected JANBU FOS = 1.159 ** (Fo factor = 1.045)

Failure surface No. 7 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	658.70	1964.95
2	679.17	1955.41
3	816.48	2010.76
4	817.84	2013.68
5	817.84	2021.68

** Corrected JANBU FOS = 1.161 ** (Fo factor = 1.041)

Failure surface No. 8 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	634.45	1957.00
2	662.39	1943.97
3	834.63	2010.51
4	834.65	2010.55
5	834.65	2018.55

** Corrected JANBU FOS = 1.164 ** (Fo factor = 1.043)

Failure surface No. 9 specified by 4 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	647.56	1960.21
2	670.92	1949.32
3	817.19	2013.80
4	817.19	2021.80

** Corrected JANBU FOS = 1.166 ** (Fo factor = 1.043)

Failure surface No.10 specified by 4 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	651.23	1961.77
2	677.04	1949.73
3	821.68	2012.97
4	821.68	2020.97

** Corrected JANBU FOS = 1.210 ** (Fo factor = 1.047)

W.O. 8838
Sec. C-C' Backcut

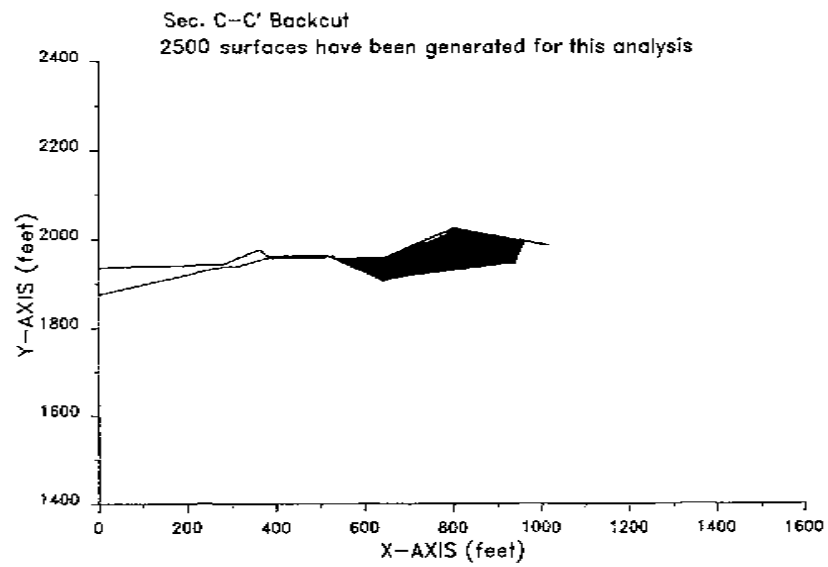
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. C-C' Backcut

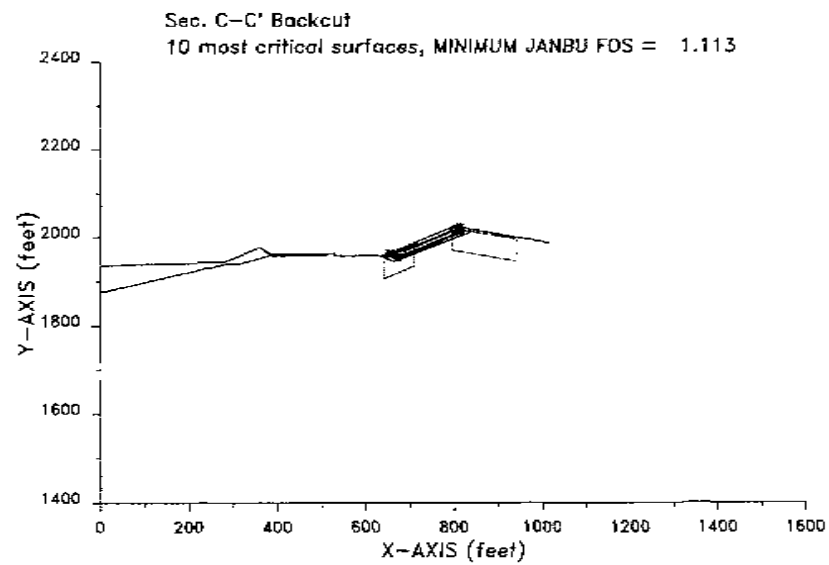
	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.113	1.037	653.83	813.33	1.171E+05
2.	1.135	1.040	654.14	807.98	1.199E+05
3.	1.139	1.030	676.03	804.63	6.408E+04
4.	1.149	1.041	655.55	804.67	1.189E+05
5.	1.154	1.021	640.66	789.17	4.970E+04
6.	1.159	1.045	661.07	803.41	1.141E+05
7.	1.161	1.041	658.70	817.84	1.316E+05
8.	1.164	1.043	634.45	834.65	1.939E+05
9.	1.166	1.043	647.56	817.19	1.477E+05
10.	1.210	1.047	651.23	821.68	1.643E+05

* * END OF FILE * * *

8838CB 11-13-** 12:21



8838CB 11-13-** 12:21



W.O. 8838
Sec. C-C' Backcut, Spencers

XSTABL File: 8838CBS 11-13-** 12:21

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 A 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 A 1545  *
*****************************************
```

Problem Description : Sec. C-C' Backcut Spencer

SEGMENT BOUNDARY COORDINATES

10 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1936.0	280.0	1943.0	1
2	280.0	1943.0	355.0	1975.0	1
3	355.0	1975.0	365.0	1975.0	1
4	365.0	1975.0	381.0	1962.0	1
5	381.0	1962.0	510.0	1962.0	1
6	510.0	1962.0	530.0	1962.0	2
7	530.0	1962.0	530.1	1957.0	2
8	530.1	1957.0	640.0	1957.0	2
9	640.0	1957.0	800.0	2025.0	2
10	800.0	2025.0	1015.0	1985.0	2

5 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1875.0	280.0	1938.0	2
2	280.0	1938.0	310.0	1938.0	2
3	310.0	1938.0	381.0	1958.0	2
4	381.0	1958.0	509.0	1958.0	2
5	509.0	1958.0	510.0	1962.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	130.0	200.0	34.00	.000	.0	0
2	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	21.00	225.0	40.00
2	24.00	150.0	11.30
3	90.00	225.0	40.00

A SINGLE FAILURE SURFACE HAS BEEN SPECIFIED FOR ANALYSIS

Trial failure surface specified by
the following 6 coordinate points :

Point No.	x-surf (ft)	y-surf (ft)
1	653.83	1962.88
2	671.86	1954.47
3	812.09	2011.86
4	813.33	2014.52
5	813.33	2014.52
6	813.33	2022.52

****
SELECTED METHOD OF ANALYSIS: Spencer (1973)
****

****
SUMMARY OF INDIVIDUAL SLICE INFORMATION
****

Slice	x-base (ft)	y-base (ft)	height (ft)	width (ft)	alpha	beta	weight (lb)
1	662.84	1958.67	8.04	18.03	-25.00	23.03	18834.

2	735.93	1980.69	17.08	128.14	22.26	23.03	284509.
3	806.05	2099.39	14.49	12.09	22.26	-10.54	22773.
4	812.71	2013.19	9.45	1.24	65.01	-10.54	1523.

ITERATIONS FOR SPENCER'S METHOD

Iter #	Theta	FOS_force	FOS_moment
2	17.1736	1.4212	1.5270
3	17.1708	1.4210	1.4212

SLICE INFORMATION ... continued :

Slice	Sigma (psf)	c-value (psf)	phi	U-base (lb)	U-top (lb)	P-top (lb)	Delta
1	2932.4	225.0	40.00	0.	0.	0.	.00
2	1938.1	150.0	11.00	0.	0.	0.	.00
3	1642.8	150.0	11.00	0.	0.	0.	.00
4	341.4	225.0	40.00	0.	0.	0.	.00

SPENCER'S (1973) - TOTAL Stresses at center of slice base

Slice #	Base x-coord (ft)	Normal Stress (psf)	Vertical Stress (psf)	Pore Water Pressure (psf)	Shear Stress (psf)
1	662.84	2932.4	1044.6	.0	1890.0
2	735.93	1938.1	2220.3	.0	370.7
3	806.05	1642.8	1883.6	.0	330.3
4	812.71	341.4	1227.9	.0	360.0

SPENCER'S (1973) - Magnitude & Location of Interslice Forces

Slice #	Right x-coord (ft)	Force Angle (degrees)	Interslice Force (lb)	Force Height (ft)	Boundary Height (ft)	Height Ratio
1	671.86	17.17	51471.	6.99	16.07	.435
2	800.00	17.17	4808.	.77	18.09	.043
3	812.09	17.17	480.	1.09	10.89	.100
4	813.33	.00	-3.	.00	8.00	.000

AVERAGE VALUES ALONG FAILURE SURFACE

Total Normal Stress = 2002.52 (psf)
Pore Water Pressure = .00 (psf)
Shear Stress = 540.82 (psf)

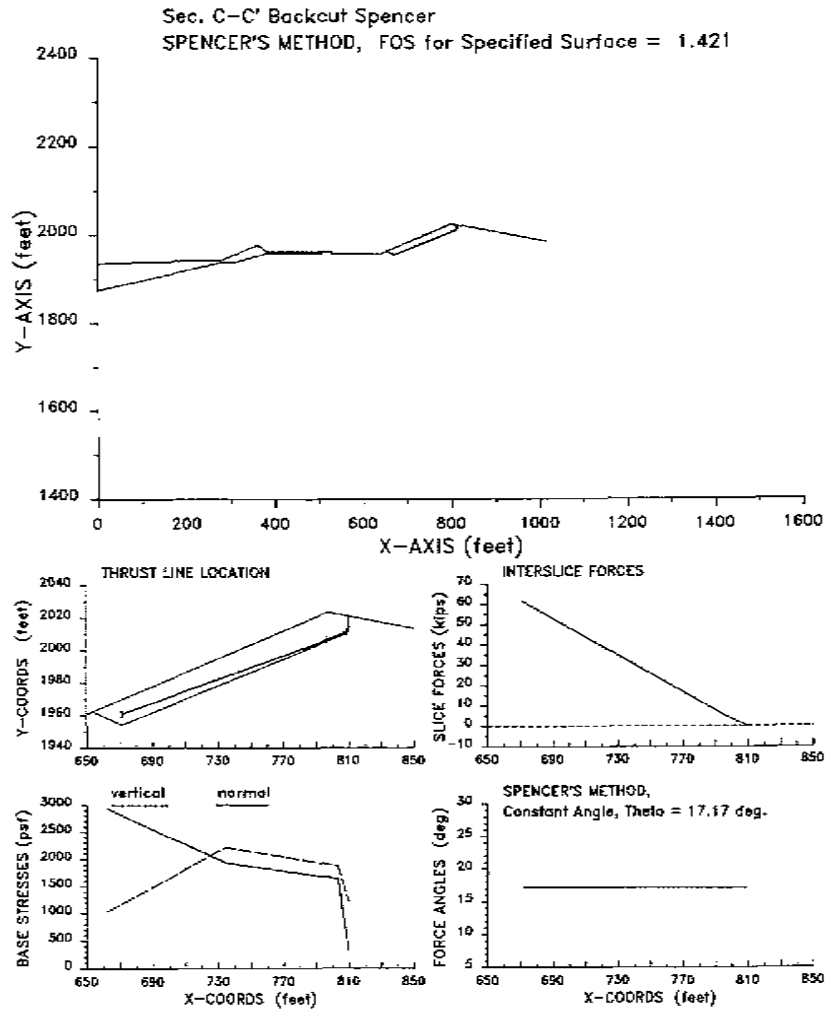
Total Length of failure surface = 174.35 feet

For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S (1973) procedure gives a

FACTOR OF SAFETY = 1.421

Total shear strength available along specified failure surface = 133.99E+03 lb

8838CBS 11-13-** 12:21



Sec. C-C' Backcut Spencer
SPENCER'S METHOD, FOS for Specified Surface = 1.421

W.O. 8838
Sec. C3-C3' W=90' D=5'

XSTABL File: 8838C3 11-20-** 12:18

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*         Copyright (C) 1992 Â 96       *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 Â 1545   *
*****************************************
```

Problem Description : Sec. C3-C3' W=90' D=5'

SEGMENT BOUNDARY COORDINATES

9 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1870.0	125.0	1870.0	1
2	125.0	1870.0	145.0	1880.0	1
3	145.0	1880.0	230.0	1880.0	1
4	230.0	1880.0	365.0	1933.0	2
5	365.0	1933.0	495.0	1933.0	2
6	495.0	1933.0	637.0	1935.0	1
7	637.0	1935.0	680.0	1957.0	2
8	680.0	1957.0	720.0	1957.0	2
9	720.0	1957.0	830.0	1957.0	1

6 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	230.0	1880.0	230.1	1875.0	1
2	230.1	1875.0	320.0	1875.0	1
3	320.0	1875.0	495.0	1933.0	1
4	637.0	1935.0	637.1	1930.0	1
5	637.1	1930.0	667.0	1930.0	1
6	667.0	1930.0	720.0	1957.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	12.00	225.0	40.00
2	16.00	150.0	11.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	230.0	1850.0	360.0	1870.0	50.0
2	400.0	1900.0	620.0	1900.0	50.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

GEOLABS-WESTLAKE VILLAGE

Plate C3.1

W.O. 8838
Sec. C3-C3' W=90' D=5'

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	211.57	1880.00
2	260.15	1857.35
3	477.04	1917.81
4	480.39	1925.00
5	480.39	1933.00

** Corrected JANBU FOS = 1.706 ** (Fo factor = 1.048)

Failure surface No. 2 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	227.90	1880.00
2	230.02	1878.87
3	237.30	1875.00
4	266.38	1861.44
5	445.21	1905.76
6	451.13	1918.46
7	454.61	1925.00
8	454.61	1933.00

** Corrected JANBU FOS = 1.752 ** (Fo factor = 1.048)

Failure surface No. 3 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	208.15	1880.00
2	260.23	1855.72
3	462.50	1912.84
4	467.67	1923.94
5	468.24	1925.00
6	468.24	1933.00

** Corrected JANBU FOS = 1.756 ** (Fo factor = 1.053)

Failure surface No. 4 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	216.14	1880.00
2	259.55	1859.75
3	512.28	1917.44
4	515.95	1925.30
5	515.95	1933.30

** Corrected JANBU FOS = 1.759 ** (Fo factor = 1.039)

Failure surface No. 5 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	194.36	1880.00
2	248.94	1854.55
3	437.69	1906.55
4	441.80	1915.37
5	446.92	1925.00
6	446.92	1933.00

** Corrected JANBU FOS = 1.768 ** (Fo factor = 1.056)

Failure surface No. 6 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	188.44	1880.00
2	244.53	1853.84
3	444.90	1909.86
4	448.51	1917.59
5	452.45	1925.00
6	452.45	1933.00

** Corrected JANBU FOS = 1.770 ** (Fo factor = 1.055)

Failure surface No. 7 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	210.01	1880.00
2	259.93	1856.72
3	533.30	1924.53
4	533.77	1925.55
5	533.77	1933.55

** Corrected JANBU FOS = 1.774 ** (Fo factor = 1.041)

Failure surface No. 8 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	190.29	1880.00
2	244.24	1854.84
3	515.71	1921.55
4	517.46	1925.32
5	517.46	1933.32

** Corrected JANBU FOS = 1.775 ** (Fo factor = 1.043)

Failure surface No. 9 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	232.60	1881.02
2	243.93	1875.00
3	271.02	1862.37
4	488.10	1919.49
5	490.67	1925.00
6	490.67	1933.00

** Corrected JANBU FOS = 1.778 ** (Fo factor = 1.042)

Failure surface No.10 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)

W.O. 8838
Sec. C3-C3' W=90' D=5'

1	194.11	1880.00
2	246.43	1855.60
3	405.74	1896.14
4	409.75	1904.75
5	420.52	1925.00
6	420.52	1933.00

** Corrected JANBU FOS = 1.794 ** (Fo factor = 1.060)

The following is a summary of the TEN most critical surfaces

Problem Description : Sec. C3-C3' W=90' D=5'

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.706	1.048	211.57	480.39	3.567E+05
2.	1.752	1.048	227.90	454.61	3.248E+05
3.	1.756	1.053	208.15	468.24	3.738E+05
4.	1.759	1.039	216.14	515.95	3.742E+05
5.	1.768	1.056	194.36	446.92	3.636E+05
6.	1.770	1.055	188.44	452.45	3.664E+05
7.	1.774	1.041	210.01	533.77	4.066E+05
8.	1.775	1.043	190.29	517.46	4.015E+05
9.	1.778	1.042	232.60	490.67	3.391E+05
10.	1.794	1.060	194.11	420.52	3.433E+05

* * * END OF FILE * * *

W.O. 8838
Sec. C3-C3' Pseudo

XSTABL File: 8838C3P 11-20-** 12:18

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*         Copyright (C) 1992 À 96       *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 À 1545   *
*****************************************
```

Problem Description : Sec. C3-C3' W=90' D=5' Pseudo

SEGMENT BOUNDARY COORDINATES

9 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1870.0	125.0	1870.0	1
2	125.0	1870.0	145.0	1880.0	1
3	145.0	1880.0	230.0	1880.0	1
4	230.0	1880.0	365.0	1933.0	2
5	365.0	1933.0	495.0	1933.0	2
6	495.0	1933.0	637.0	1935.0	1
7	637.0	1935.0	680.0	1957.0	2
8	680.0	1957.0	720.0	1957.0	2
9	720.0	1957.0	830.0	1957.0	1

6 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	230.0	1880.0	230.1	1875.0	1
2	230.1	1875.0	320.0	1875.0	1
3	320.0	1875.0	495.0	1933.0	1
4	637.0	1935.0	637.1	1930.0	1
5	637.1	1930.0	667.0	1930.0	1
6	667.0	1930.0	720.0	1957.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	12.00	225.0	40.00
2	16.00	150.0	11.00
3	90.00	225.0	40.00

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	230.0	1850.0	360.0	1870.0	50.0
2	400.0	1900.0	620.0	1900.0	50.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	216.14	1880.00
2	259.55	1859.75
3	512.28	1917.44
4	515.95	1925.30
5	515.95	1933.30

** Corrected JANBU FOS = 1.045 ** (Fo factor = 1.039)

Failure surface No. 2 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	228.50	1880.00
2	230.02	1879.20
3	237.91	1875.00
4	263.85	1862.90
5	526.89	1921.59
6	528.70	1925.47
7	528.70	1933.47

** Corrected JANBU FOS = 1.046 ** (Fo factor = 1.034)

Failure surface No. 3 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	208.72	1880.00
2	250.40	1860.57
3	499.42	1914.47
4	503.38	1925.12
5	503.38	1933.12

** Corrected JANBU FOS = 1.057 ** (Fo factor = 1.039)

Failure surface No. 4 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	203.53	1880.00
2	255.04	1855.98
3	553.94	1920.01
4	556.67	1925.87
5	556.67	1933.87

** Corrected JANBU FOS = 1.071 ** (Fo factor = 1.039)

Failure surface No. 5 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	210.01	1880.00
2	259.93	1856.72
3	533.30	1924.53
4	533.77	1925.55
5	533.77	1933.55

** Corrected JANBU FOS = 1.073 ** (Fo factor = 1.041)

Failure surface No. 6 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	226.58	1880.00
2	230.04	1878.16
3	235.99	1875.00
4	268.67	1859.76
5	533.42	1922.89
6	534.67	1925.56
7	534.67	1933.56

** Corrected JANBU FOS = 1.074 ** (Fo factor = 1.038)

Failure surface No. 7 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	190.29	1880.00
2	244.24	1854.84
3	515.71	1921.55
4	517.46	1925.32
5	517.46	1933.32

** Corrected JANBU FOS = 1.074 ** (Fo factor = 1.043)

Failure surface No. 8 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	211.57	1880.00
2	260.15	1857.35
3	477.04	1917.81
4	480.39	1925.00
5	480.39	1933.00

** Corrected JANBU FOS = 1.084 ** (Fo factor = 1.048)

Failure surface No. 9 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	235.11	1882.01
2	248.28	1875.00
3	275.21	1862.44
4	537.15	1922.91
5	538.41	1925.61
6	538.41	1933.61

** Corrected JANBU FOS = 1.089 ** (Fo factor = 1.037)

W.O. 8838
Sec. C3-C3' Pseudo

Failure surface No.10 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	227.90	1880.00
2	230.02	1878.87
3	237.30	1875.00
4	266.38	1861.44
5	445.21	1905.76
6	451.13	1918.46
7	454.61	1925.00
8	454.61	1933.00

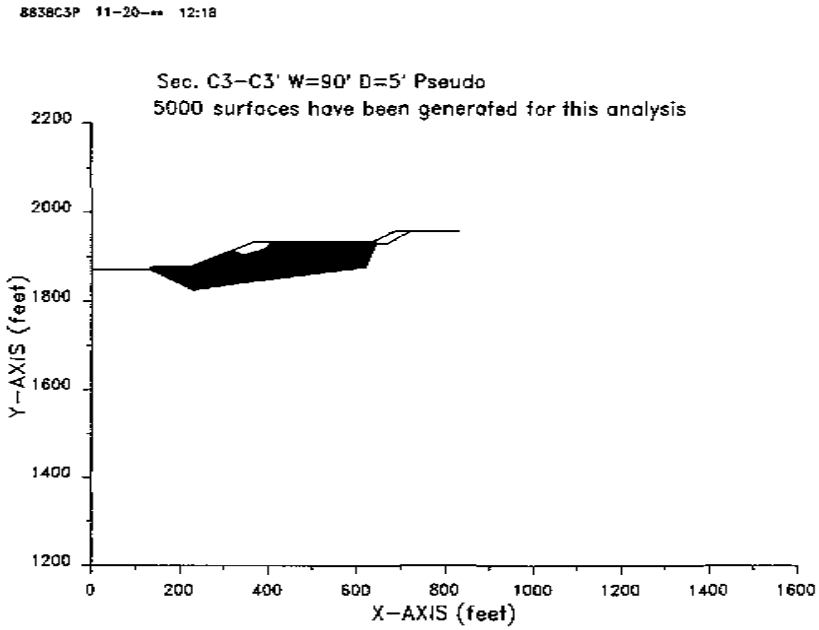
** Corrected JANBU FOS = 1.091 ** (Fo factor = 1.048)

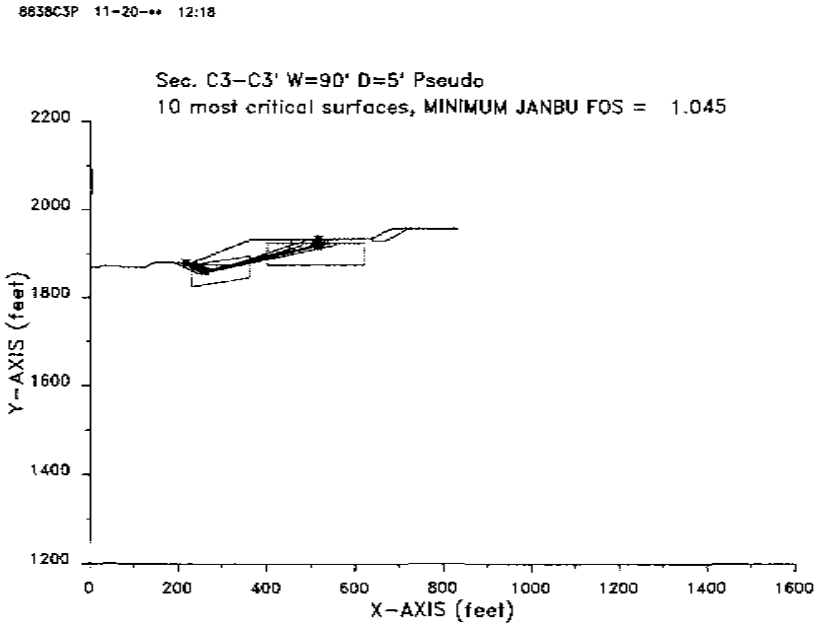
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. C3-C3' W=90' D=5' Pseudo

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.045	1.039	216.14	515.95	3.959E+05
2.	1.046	1.034	228.50	528.70	3.782E+05
3.	1.057	1.039	208.72	503.38	3.634E+05
4.	1.071	1.039	203.53	556.67	4.796E+05
5.	1.073	1.041	210.01	533.77	4.336E+05
6.	1.074	1.038	226.58	534.67	4.171E+05
7.	1.074	1.043	190.29	517.46	4.273E+05
8.	1.084	1.048	211.57	480.39	3.801E+05
9.	1.089	1.037	235.11	538.41	4.038E+05
10.	1.091	1.048	227.90	454.61	3.409E+05

* * * END OF FILE * * *





W.O. 8838

Sec. C3-C3' Pseudo., Spencer's

XSTABL File: 8838C3PS 11-20-** 12:19

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 À 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 À 1545  *
*****************************************
```

Problem Description : Sec. C3-C3' W=90' D=5' Pseudo Spenc

SEGMENT BOUNDARY COORDINATES

9 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1870.0	125.0	1870.0	1
2	125.0	1870.0	145.0	1880.0	1
3	145.0	1880.0	230.0	1880.0	1
4	230.0	1880.0	365.0	1933.0	2
5	365.0	1933.0	495.0	1933.0	2
6	495.0	1933.0	637.0	1935.0	1
7	637.0	1935.0	680.0	1957.0	2
8	680.0	1957.0	720.0	1957.0	2
9	720.0	1957.0	830.0	1957.0	1

6 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	230.0	1880.0	230.1	1875.0	1
2	230.1	1875.0	320.0	1875.0	1
3	320.0	1875.0	495.0	1933.0	1
4	637.0	1935.0	637.1	1930.0	1
5	637.1	1930.0	667.0	1930.0	1
6	667.0	1930.0	720.0	1957.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	12.00	225.0	40.00
2	16.00	150.0	11.00
3	90.00	225.0	40.00

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A SINGLE FAILURE SURFACE HAS BEEN SPECIFIED FOR ANALYSIS

Trial failure surface specified by the following 5 coordinate points :

Point No.	x-surf (ft)	y-surf (ft)
1	216.14	1889.00
2	259.55	1859.75
3	512.28	1917.44
4	515.95	1925.30
5	515.95	1933.30

****
SELECTED METHOD OF ANALYSIS: Spencer (1973)
****

****

W.O. 8838

Sec. C3-C3' Pseudo., Spencer's

SUMMARY OF INDIVIDUAL SLICE INFORMATION
****

Slice	x-base (ft)	y-base (ft)	height (ft)	width (ft)	alpha	beta	weight (lb)
1	223.07	1876.77	3.23	13.86	-25.01	.00	5825.
2	230.05	1873.51	6.51	.10	-25.01	21.43	83.
3	244.82	1866.62	19.20	29.45	-25.01	21.43	71919.
4	289.77	1866.65	36.82	60.45	12.86	21.43	280728.
5	342.50	1878.68	45.48	45.00	12.86	21.43	256684.
6	430.00	1898.66	34.34	130.00	12.86	.00	566376.
7	503.64	1915.47	17.65	17.28	12.86	.81	39658.
8	514.11	1921.37	11.90	3.67	64.97	.81	5675.

ITERATIONS FOR SPENCER'S METHOD

Iter #	Theta	FOS_force	FOS_moment
2	14.5280	1.2704	1.1711
3	13.9876	-----	1.2704
3	14.2578	1.2637	-----
4	14.0187	1.2579	1.2637
5	14.0327	1.2583	1.2579

SLICE INFORMATION ... continued :

Slice	Sigma (psf)	c-value (psf)	phi	U-base (lb)	U-top (lb)	P-top (lb)	Delta
1	1312.9	225.0	40.00	0.	0.	0.	.00
2	2293.4	225.0	40.00	0.	0.	0.	.00
3	6110.0	225.0	40.00	0.	0.	0.	.00
4	4244.5	150.0	11.00	0.	0.	0.	.00
5	5212.9	150.0	11.00	0.	0.	0.	.00
6	3982.1	150.0	11.00	0.	0.	0.	.00
7	2098.9	150.0	11.00	0.	0.	0.	.00
8	412.1	225.0	40.00	0.	0.	0.	.00

SPENCER'S (1973) - TOTAL Stresses at center of slice base

Slice #	Base x-coord (ft)	Normal Stress (psf)	Vertical Stress (psf)	Pore Water Pressure (psf)	Shear Stress (psf)
1	223.07	1312.9	420.3	.0	1054.4
2	230.05	2293.4	833.5	.0	1708.2
3	244.82	6110.0	2442.1	.0	4253.3
4	289.77	4244.5	4644.0	.0	774.9
5	342.50	5212.9	5704.1	.0	924.5
6	430.00	3982.1	4356.7	.0	734.4
7	503.64	2098.9	2295.0	.0	443.4
8	514.11	412.1	1547.2	.0	453.6

SPENCER'S (1973) - Magnitude & Location of Interslice Forces

Slice #	Right x-coord (ft)	Force Angle (degrees)	Interslice Force (lb)	Force Height (ft)	Boundary Height (ft)	Height Ratio
1	230.00	14.03	22912.	4.90	6.47	.758
2	230.10	14.03	23186.	4.91	6.55	.750
3	259.55	14.03	227700.	11.66	31.85	.366
4	320.00	14.03	172208.	12.35	41.78	.296
5	365.00	14.03	120209.	11.41	49.18	.232
6	495.00	14.03	9240.	7.10	19.50	.364
7	512.28	14.03	2473.	5.56	15.80	.352
8	515.95	.00	-25.	.42	8.00	.052

AVERAGE VALUES ALONG FAILURE SURFACE

Total Normal Stress = 4098.94 (psf)
Pore Water Pressure = .00 (psf)
Shear Stress = 1124.02 (psf)

Total Length of failure surface = 315.80 feet

For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S (1973) procedure gives a

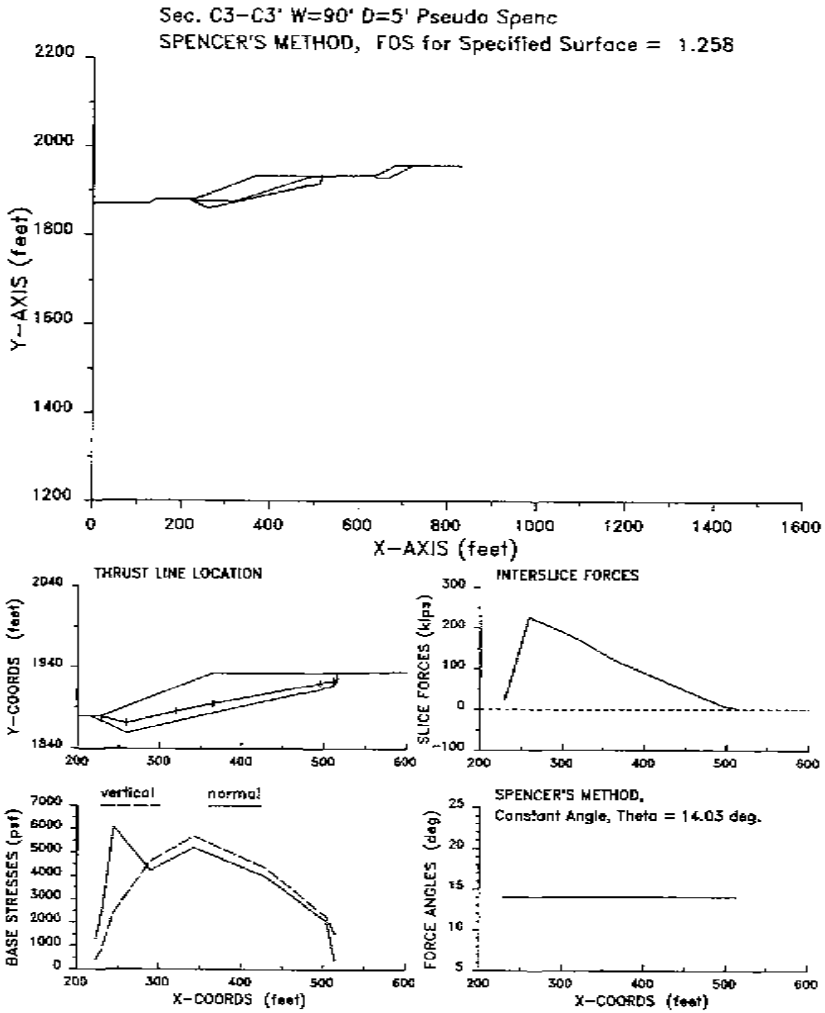
FACTOR OF SAFETY = 1.258

Total shear strength available along specified failure surface = 446.65E+03 lb

W.O. 8838

Sec. C3-C3' Pseudo., Spencer's

8838C3PS 11-20-94 12:19



Sec. C3-C3' W=90' D=5' Pseudo Spenc
SPENCER'S METHOD, FOS for Specified Surface = 1.258

W.O. 8838
Sec. C3-C3' Backcut

```
XSTABL File: 8838C3B   11-20-**   12:13

*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*         Copyright (C) 1992 À 96       *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 À 1545  *
*****************************************
```

Problem Description : Sec. C3-C3' Backcut

SEGMENT BOUNDARY COORDINATES

10 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1870.0	125.0	1870.0	1
2	125.0	1870.0	145.0	1880.0	1
3	145.0	1880.0	230.0	1880.0	1
4	230.0	1880.0	230.1	1875.0	1
5	230.1	1875.0	320.0	1875.0	1
6	320.0	1875.0	495.0	1933.0	1
7	495.0	1933.0	637.0	1935.0	1
8	637.0	1935.0	680.0	1957.0	2
9	680.0	1957.0	720.0	1957.0	2
10	720.0	1957.0	830.0	1957.0	1

3 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	637.0	1935.0	637.1	1930.0	1
2	637.1	1930.0	667.0	1930.0	1
3	667.0	1930.0	720.0	1957.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil Unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	12.00	225.0	40.00
2	16.00	150.0	11.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	320.0	1850.0	400.0	1870.0	50.0
2	495.0	1905.0	700.0	1910.0	50.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

W.O. 8838
Sec. C3-C3' Backcut

Failure surface No. 1 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	325.98	1876.98
2	338.02	1871.37
3	536.19	1925.28
4	536.32	1925.58
5	536.32	1933.58

** Corrected JANBU FOS = 1.274 ** (Fo factor = 1.019)

Failure surface No. 2 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	310.61	1875.00
2	325.68	1867.97
3	519.74	1922.72
4	520.97	1925.37
5	520.97	1933.37

** Corrected JANBU FOS = 1.288 ** (Fo factor = 1.023)

Failure surface No. 3 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	331.70	1878.88
2	342.04	1874.06
3	539.66	1925.38
4	539.77	1925.63
5	539.77	1933.63

** Corrected JANBU FOS = 1.292 ** (Fo factor = 1.018)

Failure surface No. 4 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	313.05	1875.00
2	324.11	1869.84
3	496.74	1914.24
4	501.80	1925.10
5	501.80	1933.10

** Corrected JANBU FOS = 1.295 ** (Fo factor = 1.037)

Failure surface No. 5 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	328.42	1877.79
2	336.43	1874.05
3	519.96	1919.45
4	522.73	1925.39
5	522.73	1933.39

** Corrected JANBU FOS = 1.297 ** (Fo factor = 1.029)

Failure surface No. 6 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	312.66	1875.00
2	322.73	1870.30
3	506.87	1918.62
4	509.94	1925.21
5	509.94	1933.21

** Corrected JANBU FOS = 1.298 ** (Fo factor = 1.029)

Failure surface No. 7 specified by 4 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	313.35	1875.00
2	328.25	1868.05
3	560.08	1925.92
4	560.08	1933.92

** Corrected JANBU FOS = 1.299 ** (Fo factor = 1.019)

Failure surface No. 8 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	308.89	1875.00
2	325.70	1867.16
3	512.96	1920.07
4	515.39	1925.29
5	515.39	1933.29

** Corrected JANBU FOS = 1.300 ** (Fo factor = 1.026)

Failure surface No. 9 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	316.11	1875.00
2	322.69	1871.93
3	520.42	1923.93
4	521.10	1925.37
5	521.10	1933.37

** Corrected JANBU FOS = 1.305 ** (Fo factor = 1.020)

Failure surface No.10 specified by 4 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	329.49	1878.15
2	345.01	1870.91
3	541.53	1925.66
4	541.53	1933.66

** Corrected JANBU FOS = 1.305 ** (Fo factor = 1.023)

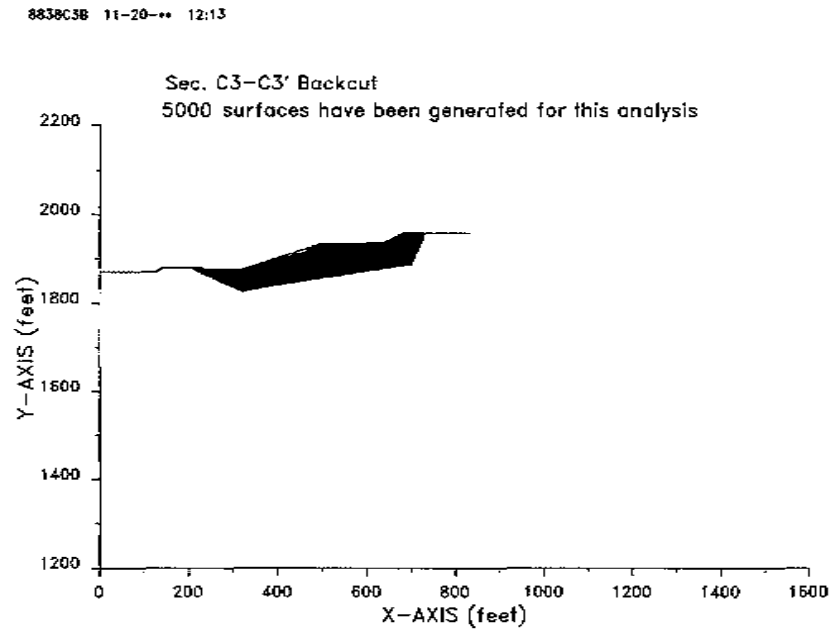
W.O. 8838
Sec. C3-C3' Backcut

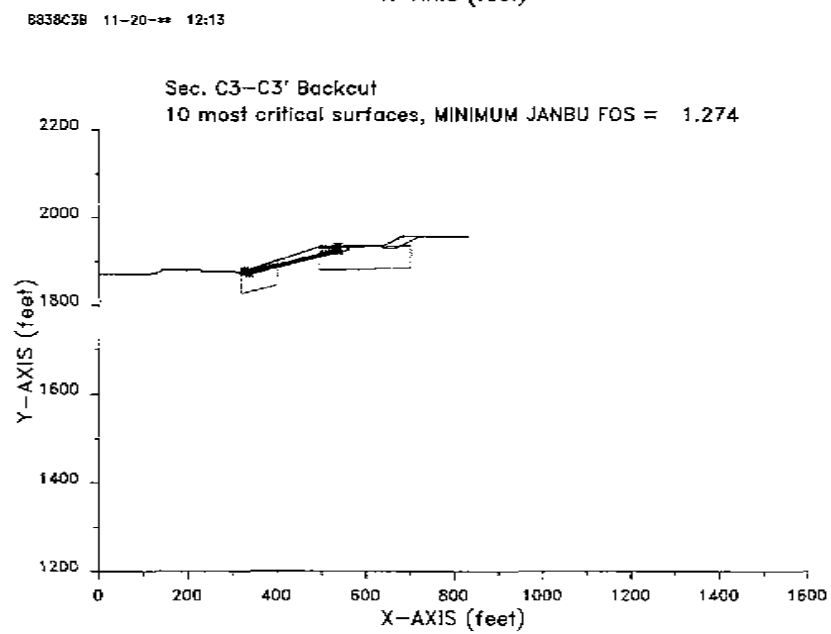
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. C3-C3' Backcut

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.274	1.019	325.98	536.32	1.145E+05
2.	1.288	1.023	310.61	520.97	1.105E+05
3.	1.292	1.018	331.70	539.77	1.089E+05
4.	1.295	1.037	313.05	501.80	9.945E+04
5.	1.297	1.029	328.42	522.73	1.010E+05
6.	1.298	1.029	312.66	509.94	9.449E+04
7.	1.299	1.019	313.35	560.08	1.454E+05
8.	1.300	1.026	308.89	515.39	1.158E+05
9.	1.305	1.020	316.11	521.10	8.531E+04
10.	1.305	1.023	329.49	541.53	1.298E+05

* * END OF FILE * * *





GEOLABS-WESTLAKE VILLAGE

Plate C3b.3

W.O. 8838
Sec. D-D' W=100' D=5'

XSTABL File: 8838D 11-13-** 15:12

```
*****************************************
*              X S T A B L              *
*                                       *
*       Slope Stability Analysis        *
*             using the                 *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 À 96        *
*   Interactive Software Designs, Inc.  *
*       Moscow, ID 83843, U.S.A.        *
*                                       *
*         All Rights Reserved           *
*                                       *
*  Ver. 5.201                 96 À 1545 *
*****************************************
```

Problem Description : Sec. D-D' W=100' D=5'

SEGMENT BOUNDARY COORDINATES

7 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1954.0	310.0	1955.0	1
2	310.0	1955.0	700.0	2130.0	2
3	700.0	2130.0	710.0	2130.0	2
4	710.0	2130.0	760.0	2120.0	2
5	760.0	2120.0	880.0	2080.0	1
6	880.0	2080.0	1000.0	2100.0	3
7	1000.0	2100.0	1120.0	2110.0	3

5 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	310.0	1955.0	310.1	1950.0	1
2	310.1	1950.0	410.0	1950.0	1
3	410.0	1950.0	760.0	2120.0	1
4	880.0	2080.0	1120.0	2080.0	1
5	.0	1880.0	1120.0	2020.0	4

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

4 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	1
2	125.0	135.0	200.0	34.00	.000	.0	1
3	125.0	135.0	200.0	30.00	.000	.0	1
4	130.0	140.0	200.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	6.00	225.0	40.00
2	11.00	150.0	17.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 3 coordinate points

```
**********************************
        PHREATIC SURFACE,
**********************************
```

Point No.	x-water (ft)	y-water (ft)
1	.00	1905.00
2	410.00	1950.00
3	1120.00	2050.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

W.O. 8838
Sec. D-D' W=100' D=5'

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	380.0	1940.0	600.0	2007.0	80.0
2	620.0	2020.0	980.0	2040.0	80.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	368.44	1981.22
2	414.36	1956.81
3	651.46	2001.74
4	690.97	2086.47
5	709.86	2122.00
6	709.86	2130.00

** Corrected JANBU FOS = 1.562 ** (Fo factor = 1.082)

Failure surface No. 2 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	337.91	1967.52
2	370.87	1950.00
3	395.90	1938.33
4	665.92	1990.72
5	708.18	2081.35
6	716.31	2098.78
7	726.86	2118.63
8	726.86	2126.63

** Corrected JANBU FOS = 1.575 ** (Fo factor = 1.080)

Failure surface No. 3 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	355.65	1975.48
2	395.14	1954.48
3	634.67	1998.70
4	671.10	2076.82
5	693.59	2119.12
6	693.59	2127.12

** Corrected JANBU FOS = 1.578 ** (Fo factor = 1.081)

Failure surface No. 4 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	353.11	1974.34
2	383.19	1958.35
3	641.78	2003.64
4	677.31	2079.84
5	699.65	2121.84
6	699.65	2129.84

** Corrected JANBU FOS = 1.584 ** (Fo factor = 1.080)

Failure surface No. 5 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	350.44	1973.15
2	393.98	1950.00
3	394.95	1949.54
4	691.03	2000.65
5	733.29	2091.29
6	742.78	2111.64
7	744.61	2115.08
8	744.61	2123.08

** Corrected JANBU FOS = 1.611 ** (Fo factor = 1.077)

Failure surface No. 6 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	403.08	1996.77
2	436.43	1979.03
3	654.90	2019.06
4	684.97	2083.56
5	705.41	2122.00
6	705.41	2130.00

** Corrected JANBU FOS = 1.627 ** (Fo factor = 1.081)

Failure surface No. 7 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	383.82	1988.13
2	429.15	1964.02
3	651.66	1999.13
4	692.81	2087.36
5	711.10	2121.78
6	711.10	2129.78

** Corrected JANBU FOS = 1.641 ** (Fo factor = 1.084)

Failure surface No. 8 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	385.76	1989.00
2	425.18	1968.04
3	705.16	2020.65
4	747.42	2111.28

W.O. 8838
Sec. D-D' W=100' D=5'

5	748.80	2114.24
6	748.80	2122.24

** Corrected JANBU FOS = 1.653 ** (Fo factor = 1.074)

Failure surface No. 9 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	369.81	1981.84
2	385.84	1973.31
3	684.79	2019.88
4	723.13	2102.09
5	731.43	2117.71
6	731.43	2125.71

** Corrected JANBU FOS = 1.659 ** (Fo factor = 1.074)

Failure surface No.10 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	368.51	1981.25
2	390.22	1969.71
3	713.28	2030.17
4	752.17	2113.57
5	752.17	2121.57

** Corrected JANBU FOS = 1.671 ** (Fo factor = 1.067)

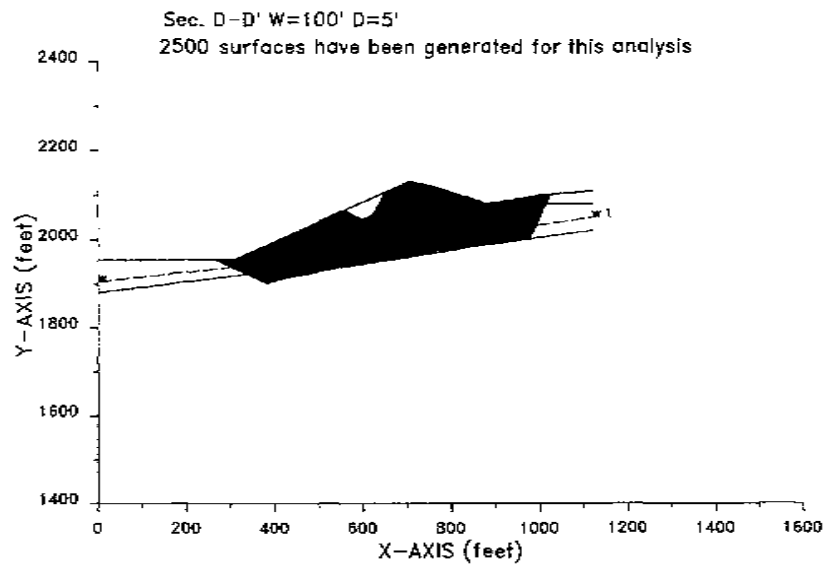
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. D-D' W=100' D=5'

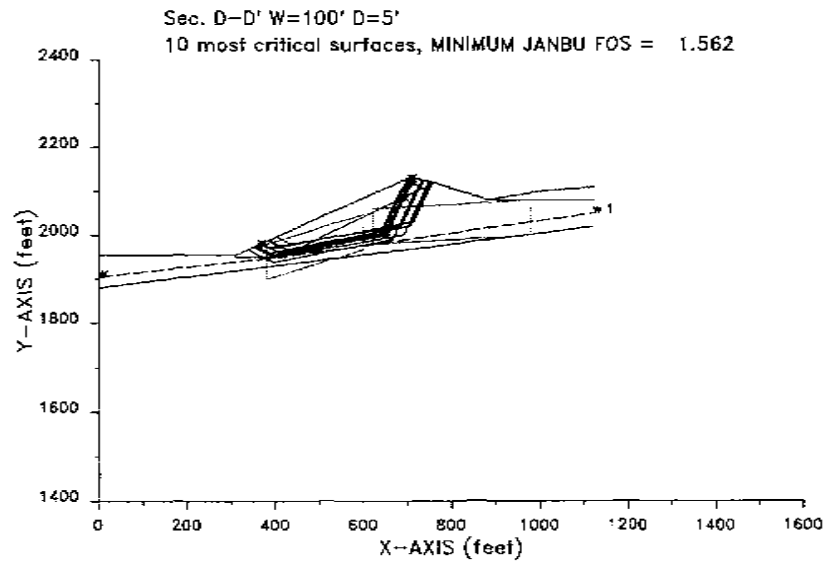
	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.562	1.082	368.44	709.86	1.277E+06
2.	1.575	1.080	337.91	726.86	1.694E+06
3.	1.578	1.081	355.65	693.59	1.215E+06
4.	1.584	1.080	353.11	699.65	1.202E+06
5.	1.611	1.077	350.44	744.61	1.614E+06
6.	1.627	1.081	403.08	705.41	9.991E+05
7.	1.641	1.084	383.82	711.10	1.264E+06
8.	1.653	1.074	385.76	748.80	1.329E+06
9.	1.659	1.074	369.81	731.43	1.212E+06
10.	1.671	1.067	368.51	752.17	1.263E+06

* * * END OF FILE * * *

8838D 11-13-** 15:12



8838D 11-13-** 15:12



W.O. 8838
Sec. D-D' Backcut

XSTABL File: 8838DB 11-13-** 15:11

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*         Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Â 1545  *
*****************************************
```

Problem Description : Sec. D-D' Backcut

SEGMENT BOUNDARY COORDINATES
---

7 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1954.0	310.0	1955.0	1
2	310.0	1955.0	310.1	1950.0	1
3	310.1	1950.0	410.0	1950.0	1
4	410.0	1950.0	760.0	2120.0	1
5	760.0	2120.0	880.0	2080.0	1
6	880.0	2080.0	1000.0	2100.0	3
7	1000.0	2100.0	1120.0	2110.0	3

2 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	880.0	2080.0	1120.0	2080.0	1
2	.0	1880.0	1120.0	2020.0	4

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

---
ISOTROPIC Soil Parameters
---

4 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	1
2	125.0	135.0	200.0	34.00	.000	.0	1
3	125.0	135.0	200.0	30.00	.000	.0	1
4	130.0	140.0	200.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	6.00	225.0	40.00
2	11.00	150.0	17.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 3 coordinate points

```
**********************************
        PHREATIC SURFACE,
**********************************
```

Point No.	x-water (ft)	y-water (ft)
1	.00	1905.00
2	410.00	1950.00
3	1120.00	2050.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of lane segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	410.0	1915.0	600.0	2007.0	60.0
2	620.0	2010.0	980.0	2040.0	80.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	397.18	1950.00
2	417.65	1940.45
3	677.07	1987.92
4	719.33	2078.55
5	727.58	2096.26
6	727.58	2104.26

** Corrected JANBU FOS = 1.279 ** (Fo factor = 1.078)

Failure surface No. 2 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	371.80	1950.00
2	411.16	1931.65
3	721.43	1987.77
4	763.69	2078.40
5	776.75	2106.42
6	776.75	2114.42

** Corrected JANBU FOS = 1.288 ** (Fo factor = 1.076)

Failure surface No. 3 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	387.00	1950.00
2	417.55	1935.76
3	721.53	1986.48
4	763.79	2077.09
5	777.37	2106.21
6	777.37	2114.21

** Corrected JANBU FOS = 1.295 ** (Fo factor = 1.077)

Failure surface No. 4 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	380.63	1950.00
2	410.55	1936.05
3	698.94	1979.53
4	741.20	2069.16
5	761.02	2111.66
6	761.02	2119.66

** Corrected JANBU FOS = 1.317 ** (Fo factor = 1.081)

Failure surface No. 5 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	425.03	1957.30
2	451.57	1944.92
3	709.33	1994.22
4	751.59	2084.85
5	763.68	2110.77
6	763.68	2118.77

** Corrected JANBU FOS = 1.318 ** (Fo factor = 1.079)

Failure surface No. 6 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	393.74	1950.00
2	428.88	1933.61
3	431.70	1932.30
4	731.00	1987.43
5	773.27	2078.07
6	785.18	2103.61
7	785.18	2111.61

** Corrected JANBU FOS = 1.335 ** (Fo factor = 1.077)

Failure surface No. 7 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	477.13	1982.50
2	483.46	1979.55
3	680.41	2015.46
4	715.31	2090.29
5	715.31	2098.29

** Corrected JANBU FOS = 1.339 ** (Fo factor = 1.077)

Failure surface No. 8 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	496.11	1991.83
2	503.17	1988.54
3	715.10	2025.76
4	753.94	2109.06
5	753.94	2117.06

** Corrected JANBU FOS = 1.340 ** (Fo factor = 1.077)

Failure surface No. 9 specified by 6 coordinate points

W.O. 8838
Sec. D-D' Backcut

Point No.	x-surf (ft)	y-surf (ft)
1	408.57	1950.00
2	430.93	1939.57
3	744.22	1993.10
4	786.48	2083.73
5	794.32	2100.56
6	794.32	2108.56

** Corrected JANBU FOS = 1.342 ** (Fo factor = 1.074)

Failure surface No.10 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	465.85	1977.13
2	484.06	1968.64
3	723.56	2013.31
4	765.82	2103.94
5	768.29	2109.24
6	768.29	2117.24

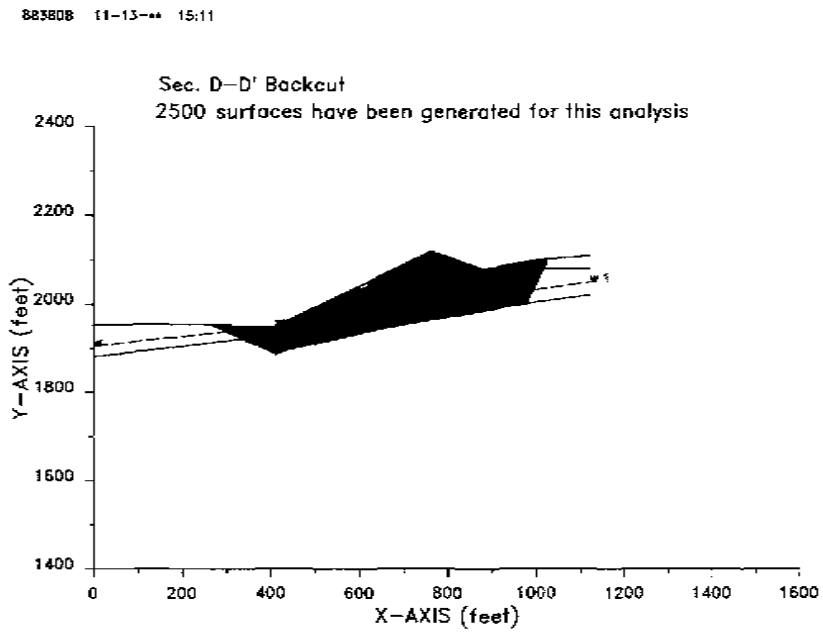
** Corrected JANBU FOS = 1.344 ** (Fo factor = 1.077)

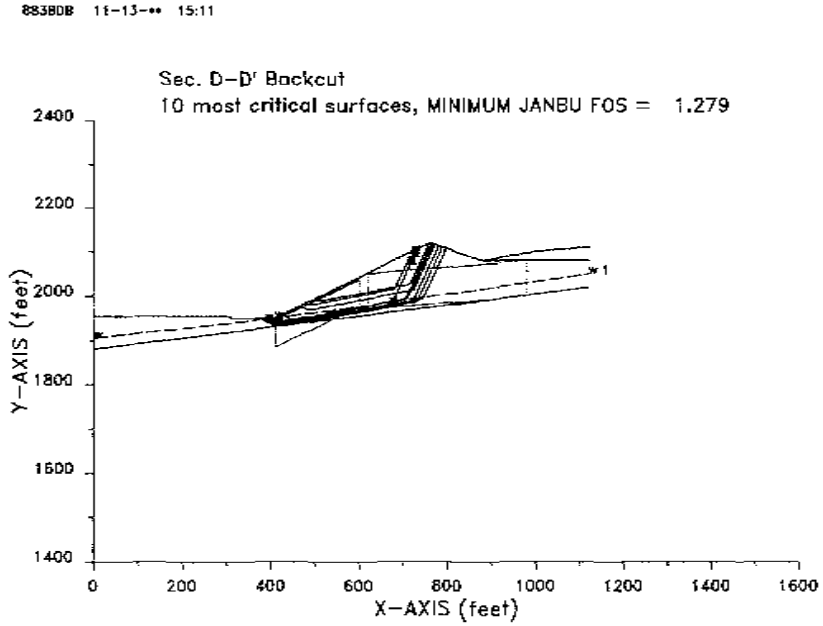
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. D-D' Backcut

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.279	1.078	397.18	727.58	8.334E+05
2.	1.288	1.076	371.80	776.75	1.224E+06
3.	1.296	1.077	387.00	777.37	1.205E+06
4.	1.317	1.081	380.63	761.02	1.127E+06
5.	1.318	1.079	425.03	763.68	1.040E+06
6.	1.335	1.077	393.74	785.18	1.341E+06
7.	1.339	1.077	477.13	715.31	4.518E+05
8.	1.340	1.077	495.11	753.94	5.354E+05
9.	1.342	1.074	408.57	794.32	1.261E+06
10.	1.344	1.077	465.85	768.29	8.136E+05

* * * END OF FILE * * *





W.O. 8838
Sec. L-L' W=70' D=5'

XSTABL File: 8838L 11-21-** 11:31

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 À 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 À 1545  *
*****************************************
```

Problem Description : Sec. L-L' W=70' D=5'

SEGMENT BOUNDARY COORDINATES

9 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1708.0	130.0	1708.0	1
2	130.0	1708.0	136.0	1705.0	1
3	136.0	1705.0	200.0	1705.0	2
4	200.0	1705.0	255.0	1705.0	2
5	255.0	1705.0	475.0	1795.0	1
6	475.0	1795.0	520.0	1790.0	1
7	520.0	1790.0	585.0	1775.0	3
8	585.0	1775.0	650.0	1800.0	3
9	650.0	1800.0	950.0	1855.0	3

6 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1625.0	200.0	1705.0	2
2	255.0	1705.0	255.1	1700.0	2
3	255.1	1700.0	325.0	1700.0	2
4	325.0	1700.0	430.0	1750.0	2
5	430.0	1750.0	520.0	1790.0	3
6	430.0	1750.0	950.0	1800.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil Unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	135.0	200.0	34.00	.000	.0	0
2	130.0	140.0	200.0	40.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	17.00	200.0	40.00
2	24.00	100.0	25.00
3	90.00	200.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	255.0	1670.0	350.0	1690.0	60.0
2	380.0	1710.0	570.0	1740.0	70.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

GEOLABS-WESTLAKE VILLAGE

Plate L.1

W.O. 8838
Sec. L-L' W=70' D=5'

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	239.04	1705.00
2	284.98	1683.58
3	456.09	1749.30
4	457.65	1752.66
5	463.32	1764.81
6	475.11	1786.99
7	475.11	1794.99

** Corrected JANBU FOS = 1.861 ** (Fo factor = 1.037)

Failure surface No. 2 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	249.54	1705.00
2	255.06	1702.07
3	258.95	1700.00
4	289.78	1685.62
5	453.03	1745.35
6	456.38	1752.54
7	461.78	1764.12
8	473.65	1786.45
9	473.65	1794.45

** Corrected JANBU FOS = 1.872 ** (Fo factor = 1.061)

Failure surface No. 3 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	234.29	1705.00
2	281.76	1682.87
3	462.32	1754.91
4	467.88	1766.83
5	478.40	1786.62
6	478.40	1794.62

** Corrected JANBU FOS = 1.883 ** (Fo factor = 1.057)

Failure surface No. 4 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	289.07	1718.94
2	324.69	1700.00
3	325.57	1699.59
4	453.88	1750.28
5	454.87	1752.39
6	459.96	1763.32
7	471.87	1785.72
8	471.87	1793.72

** Corrected JANBU FOS = 1.890 ** (Fo factor = 1.065)

Failure surface No. 5 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	275.01	1713.18
2	299.80	1700.00
3	314.41	1693.19
4	450.55	1752.03
5	454.74	1760.99
6	466.77	1783.64
7	466.77	1791.64

** Corrected JANBU FOS = 1.903 ** (Fo factor = 1.062)

Failure surface No. 6 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	268.32	1710.45
2	287.97	1700.00
3	300.89	1693.98
4	468.91	1752.55
5	469.49	1753.80
6	477.59	1771.15
7	485.40	1785.84
8	485.40	1793.84

** Corrected JANBU FOS = 1.909 ** (Fo factor = 1.056)

Failure surface No. 7 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	259.37	1706.79
2	272.13	1700.00
3	301.27	1686.41
4	461.94	1747.45
5	464.68	1753.33
6	471.79	1768.57
7	481.22	1786.31
8	481.22	1794.31

** Corrected JANBU FOS = 1.910 ** (Fo factor = 1.060)

Failure surface No. 8 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	255.85	1705.35
2	265.90	1700.00
3	286.23	1690.52
4	453.67	1747.12
5	456.18	1752.52
6	461.55	1764.02
7	473.42	1785.35
8	473.42	1794.35

** Corrected JANBU FOS = 1.916 ** (Fo factor = 1.060)

Failure surface No. 9 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)

W.O. 8838
Sec. L-L' W=70' D=5'

1	239.48	1705.00
2	279.87	1686.16
3	447.28	1744.92
4	450.57	1751.98
5	454.78	1761.01
6	466.82	1783.65
7	466.82	1791.65

** Corrected JANBU FOS = 1.919 ** (Fo factor = 1.060)

Failure surface No.10 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	241.55	1705.00
2	279.84	1687.14
3	453.56	1749.39
4	454.96	1752.40
5	460.08	1763.37
6	471.99	1785.77
7	471.99	1793.77

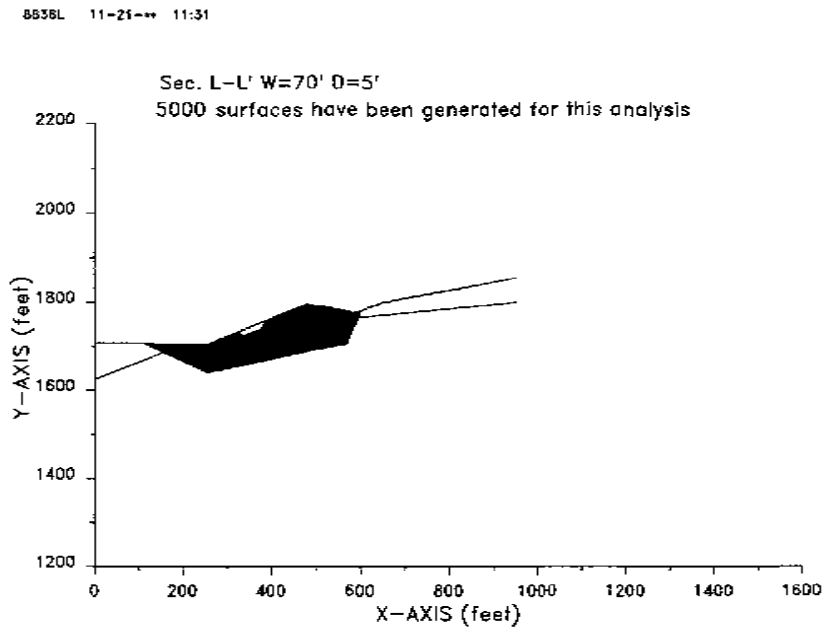
** Corrected JANBU FOS = 1.919 ** (Fo factor = 1.057)

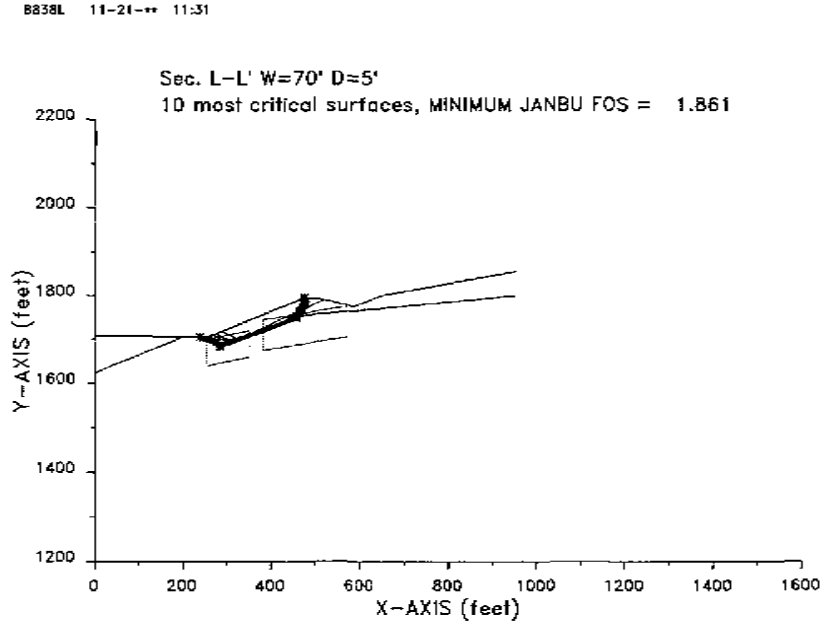
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. L-L' W=70' D=5'

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.861	1.057	239.04	475.11	5.363E+05
2.	1.872	1.061	249.54	473.65	5.324E+05
3.	1.883	1.057	234.29	478.40	5.382E+05
4.	1.890	1.065	289.07	471.87	4.054E+05
5.	1.903	1.062	275.01	466.77	4.344E+05
6.	1.909	1.056	268.32	485.40	5.004E+05
7.	1.910	1.060	259.37	481.22	5.754E+05
8.	1.916	1.060	255.85	473.42	4.893E+05
9.	1.919	1.060	239.48	466.82	5.016E+05
10.	1.919	1.057	241.55	471.99	4.998E+05

* * * END OF FILE * * *





W.O. 8838

Sec. L-L' W=70' D=5' Pseudo

XSTABL File: 8838LP 11-21-** 11:31

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*       Copyright (C) 1992 Â 96         *
*   Interactive Software Designs, Inc.  *
*       Moscow, ID 83843, U.S.A.        *
*                                       *
*         All Rights Reserved           *
*                                       *
*  Ver. 5.201                96 Â 1545  *
*****************************************
```

Problem Description : Sec. L-L' W=70' D=5' Pseudo

SEGMENT BOUNDARY COORDINATES

9 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1708.0	130.0	1708.0	1
2	130.0	1708.0	136.0	1705.0	1
3	136.0	1705.0	200.0	1705.0	2
4	200.0	1705.0	255.0	1705.0	2
5	255.0	1705.0	475.0	1795.0	1
6	475.0	1795.0	520.0	1790.0	1
7	520.0	1790.0	585.0	1775.0	3
8	585.0	1775.0	650.0	1800.0	3
9	650.0	1800.0	950.0	1855.0	3

6 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1625.0	200.0	1705.0	2
2	255.0	1705.0	255.1	1700.0	2
3	255.1	1700.0	325.0	1700.0	2
4	325.0	1700.0	430.0	1750.0	2
5	430.0	1750.0	520.0	1790.0	3
6	430.0	1750.0	950.0	1800.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	135.0	200.0	34.00	.000	.0	0
2	130.0	140.0	200.0	40.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	17.00	200.0	40.00
2	24.00	100.0	25.00
3	90.00	200.0	40.00

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	255.0	1670.0	350.0	1690.0	60.0
2	380.0	1710.0	570.0	1740.0	70.0

W.O. 8838
Sec. L-L' W=70' D=5' Pseudo

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	250.90	1705.00
2	255.04	1702.80
3	260.30	1700.00
4	287.76	1687.20
5	480.30	1747.98
6	483.65	1755.16
7	494.64	1778.73
8	497.70	1784.48
9	497.70	1792.48

** Corrected JANBU FOS = 1.311 ** (Fo factor = 1.056)

Failure surface No. 2 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	239.04	1705.00
2	284.98	1683.58
3	456.09	1749.30
4	457.65	1752.66
5	463.32	1764.81
6	475.11	1786.99
7	475.11	1794.99

** Corrected JANBU FOS = 1.318 ** (Fo factor = 1.057)

Failure surface No. 3 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	249.54	1705.00
2	255.06	1702.07
3	258.95	1700.00
4	289.78	1685.62
5	453.03	1745.35
6	456.38	1752.54
7	461.78	1764.12
8	473.65	1786.45
9	473.65	1794.45

** Corrected JANBU FOS = 1.321 ** (Fo factor = 1.061)

Failure surface No. 4 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	268.32	1710.45
2	287.97	1700.00
3	300.89	1693.98
4	468.91	1752.55
5	469.49	1753.80
6	477.59	1771.15
7	485.40	1785.84
8	485.40	1793.84

** Corrected JANBU FOS = 1.323 ** (Fo factor = 1.056)

Failure surface No. 5 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	282.14	1716.10
2	312.42	1700.00
3	317.16	1697.79
4	481.05	1755.18
5	491.35	1777.26
6	495.32	1784.74
7	495.32	1792.74

** Corrected JANBU FOS = 1.324 ** (Fo factor = 1.055)

Failure surface No. 6 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	235.65	1705.00
2	279.74	1684.44
3	489.59	1757.53
4	500.73	1781.44
5	502.09	1783.99
6	502.09	1791.99

** Corrected JANBU FOS = 1.324 ** (Fo factor = 1.049)

Failure surface No. 7 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	289.07	1718.94
2	324.69	1700.00
3	325.57	1699.59
4	453.88	1750.28
5	454.87	1752.39
6	459.96	1763.32
7	471.87	1785.72
8	471.87	1793.72

** Corrected JANBU FOS = 1.330 ** (Fo factor = 1.065)

Failure surface No. 8 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	271.00	1711.55
2	292.72	1700.00
3	304.11	1694.69
4	462.68	1746.94
5	465.71	1753.43

W.O. 8838
Sec. L-L' W=70' D=5' Pseudo

6	473.03	1769.12
7	482.11	1786.21
8	482.11	1794.21

** Corrected JANBU FOS = 1.330 ** (Fo factor = 1.063)

Failure surface No. 9 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	234.29	1705.00
2	281.76	1682.87
3	462.32	1754.91
4	467.88	1766.83
5	478.40	1786.62
6	478.40	1794.62

** Corrected JANBU FOS = 1.332 ** (Fo factor = 1.057)

Failure surface No.10 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	255.85	1705.35
2	265.90	1700.00
3	286.23	1690.52
4	453.67	1747.12
5	456.18	1752.52
6	461.55	1764.02
7	473.42	1786.35
8	473.42	1794.35

** Corrected JANBU FOS = 1.336 ** (Fo factor = 1.060)

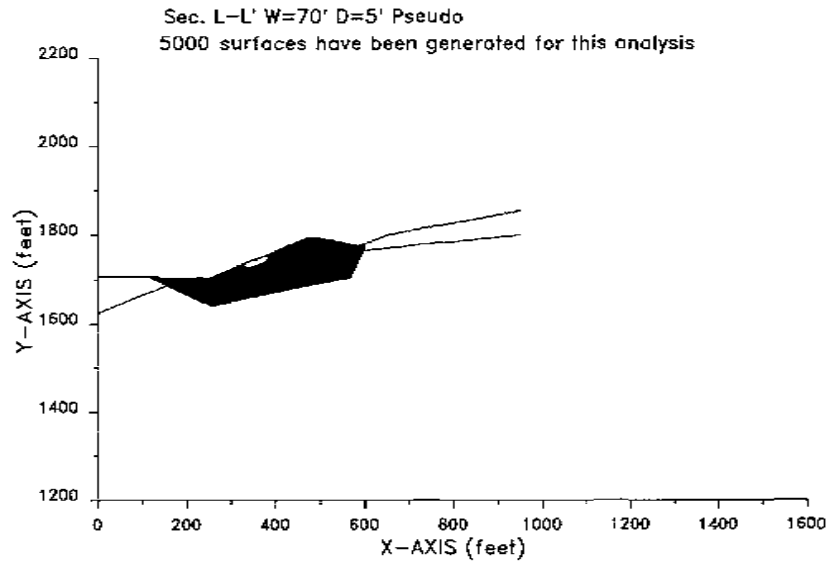
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. L-L' W=70' D=5' Pseudo

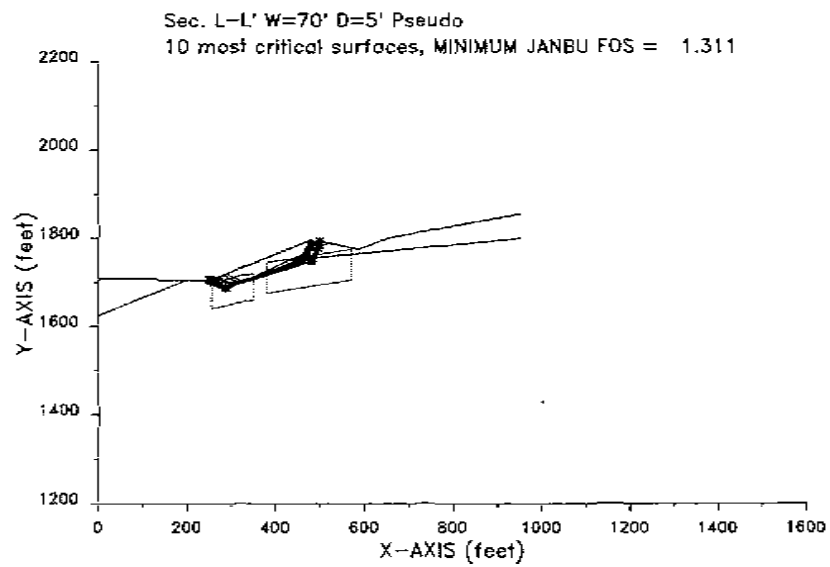
	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.311	1.056	250.90	497.70	6.034E+05
2.	1.318	1.057	239.04	475.11	5.296E+05
3.	1.321	1.061	249.54	473.65	5.241E+05
4.	1.323	1.056	268.32	485.40	4.976E+05
5.	1.324	1.055	282.14	495.32	4.894E+05
6.	1.324	1.049	235.65	502.09	6.026E+05
7.	1.330	1.065	289.07	471.87	3.976E+05
8.	1.330	1.063	271.00	482.11	4.907E+05
9.	1.332	1.057	234.29	478.40	5.316E+05
10.	1.336	1.060	255.85	473.42	4.757E+05

* * * END OF FILE * * *

8838LP 11-21-** 11:31



8838LP 11-21-** 11:31



W.O. 8838
Sec. L-L' Backcut

XSTABL File: 8838LB 11-21-** 11:34

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*       Moscow, ID 83843, U.S.A.        *
*                                       *
*         All Rights Reserved           *
*                                       *
* Ver. 5.201                96 Â 1545   *
*****************************************
```

Problem Description : Sec. L-L' Backcut

SEGMENT BOUNDARY COORDINATES

11 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1708.0	130.0	1708.0	1
2	130.0	1708.0	136.0	1705.0	1
3	136.0	1705.0	200.0	1705.0	2
4	200.0	1705.0	255.0	1705.0	2
5	255.0	1705.0	255.1	1700.0	2
6	255.1	1700.0	325.0	1700.0	2
7	325.0	1700.0	430.0	1750.0	2
8	430.0	1750.0	520.0	1790.0	3
9	520.0	1790.0	585.0	1775.0	3
10	585.0	1775.0	650.0	1800.0	3
11	650.0	1800.0	950.0	1855.0	3

2 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1625.0	200.0	1705.0	2
2	430.0	1750.0	950.0	1800.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	135.0	200.0	34.00	.000	.0	0
2	130.0	140.0	200.0	40.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	17.00	200.0	40.00
2	24.00	100.0	25.00
3	90.00	200.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	325.0	1665.0	390.0	1695.0	60.0
2	400.0	1700.0	530.0	1750.0	70.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

W.O. 8838
Sec. L-L' Backcut

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	331.66	1703.17
2	340.13	1699.22
3	469.94	1754.02
4	473.31	1761.25
5	473.31	1769.25

** Corrected JANBU FOS = 1.479 ** (Fo factor = 1.035)

Failure surface No. 2 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	332.76	1703.69
2	341.23	1699.74
3	467.81	1750.89
4	469.15	1753.76
5	472.46	1760.87
6	472.46	1768.87

** Corrected JANBU FOS = 1.491 ** (Fo factor = 1.040)

Failure surface No. 3 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	323.79	1700.00
2	331.66	1696.33
3	512.95	1757.37
4	513.25	1758.00
5	524.01	1781.08
6	524.01	1789.08

** Corrected JANBU FOS = 1.496 ** (Fo factor = 1.047)

Failure surface No. 4 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	338.51	1706.43
2	347.73	1702.13
3	488.27	1754.29
4	488.91	1755.66
5	496.27	1771.45
6	496.27	1779.45

** Corrected JANBU FOS = 1.506 ** (Fo factor = 1.047)

Failure surface No. 5 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	335.01	1704.77
2	344.18	1700.49
3	502.59	1755.78
4	503.18	1757.04
5	513.47	1779.10
6	513.47	1787.10

** Corrected JANBU FOS = 1.507 ** (Fo factor = 1.050)

Failure surface No. 6 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	331.02	1702.87
2	343.37	1697.11
3	483.90	1751.42
4	485.73	1755.36
5	492.45	1769.75
6	492.45	1777.75

** Corrected JANBU FOS = 1.507 ** (Fo factor = 1.048)

Failure surface No. 7 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	329.00	1701.90
2	336.31	1698.49
3	496.49	1752.74
4	498.28	1756.57
5	507.56	1776.47
6	507.56	1784.47

** Corrected JANBU FOS = 1.509 ** (Fo factor = 1.051)

Failure surface No. 8 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	328.82	1701.82
2	341.17	1696.06
3	488.16	1757.69
4	494.14	1770.51
5	494.14	1778.51

** Corrected JANBU FOS = 1.510 ** (Fo factor = 1.039)

Failure surface No. 9 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	314.04	1700.00
2	331.12	1692.03
3	482.02	1755.78
4	487.52	1767.56
5	487.52	1775.56

** Corrected JANBU FOS = 1.512 ** (Fo factor = 1.037)

Failure surface No.10 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)

W.O. 8838
Sec. L-L' Backcut

1	317.70	1700.00
2	330.09	1694.22
3	459.50	1746.99
4	462.36	1753.11
5	464.29	1757.24
6	464.29	1765.24

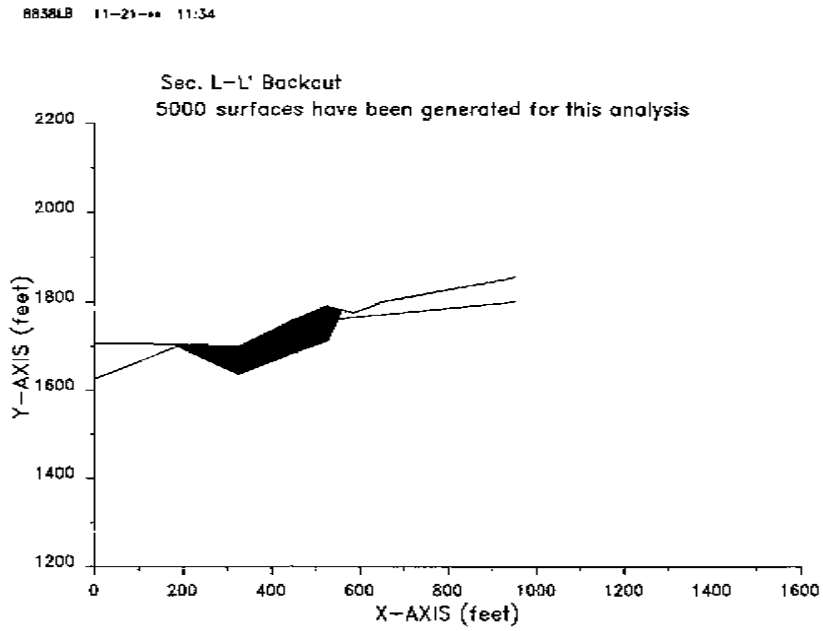
** Corrected JANBU FOS = 1.513 ** (Fo factor = 1.040)

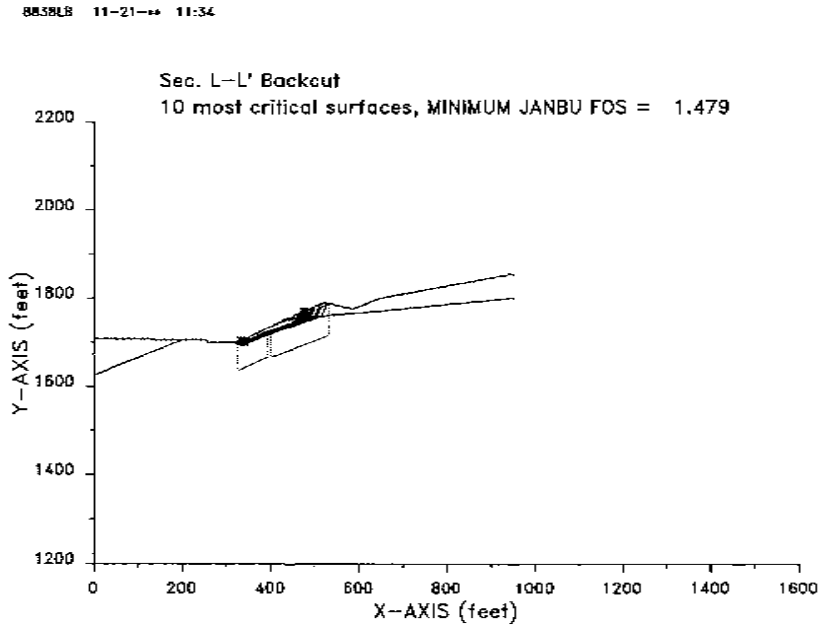
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. L-L' Backcut

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.479	1.035	331.66	473.31	1.107E+05
2.	1.491	1.040	332.76	472.46	1.181E+05
3.	1.496	1.047	323.79	524.01	2.484E+05
4.	1.506	1.047	338.51	496.27	1.656E+05
5.	1.507	1.050	335.01	513.47	2.145E+05
6.	1.507	1.048	331.02	492.45	1.889E+05
7.	1.509	1.051	329.00	507.56	2.076E+05
8.	1.510	1.039	328.82	494.14	1.768E+05
9.	1.512	1.037	314.04	487.52	1.716E+05
10.	1.513	1.040	317.70	464.29	1.246E+05

* * * END OF FILE * * *





W.O. 8838
Sec. M-M' W=60'D=5'

XSTABL File: B838M 11-22-** 12:03

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Ä 96        *
*   Interactive Software Designs, Inc.  *
*       Moscow, ID 83843, U.S.A.        *
*                                       *
*         All Rights Reserved           *
*                                       *
*  Ver. 5.201                96 Ä 1545  *
*****************************************
```

Problem Description : Sec. M-M' W=60' D=5'

SEGMENT BOUNDARY COORDINATES

11 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1665.0	215.0	1667.0	1
2	215.0	1667.0	340.0	1667.0	2
3	340.0	1667.0	490.0	1720.0	1
4	490.0	1720.0	570.0	1750.0	1
5	570.0	1750.0	735.0	1805.0	1
6	735.0	1805.0	800.0	1820.0	3
7	800.0	1820.0	1250.0	1910.0	3
8	1250.0	1910.0	1370.0	1955.0	3
9	1370.0	1955.0	1450.0	1955.0	3
10	1450.0	1955.0	1540.0	1930.0	3
11	1540.0	1930.0	1670.0	1860.0	3

6 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1585.0	215.0	1667.0	2
2	340.0	1667.0	340.1	1662.0	2
3	340.1	1662.0	400.0	1662.0	2
4	400.0	1662.0	560.0	1745.0	2
5	560.0	1745.0	735.0	1805.0	3
6	560.0	1745.0	1670.0	1860.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	135.0	200.0	34.00	.000	.0	0
2	130.0	140.0	200.0	40.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	200.0	40.00
2	15.00	100.0	25.00
3	90.00	200.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	5.00	225.0	40.00
2	10.00	100.0	25.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

W.O. 8838
Sec. M-M' W=60'D=5'

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	340.0	1620.0	480.0	1670.0	70.0
2	500.0	1675.0	850.0	1760.0	90.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	357.74	1673.27
2	378.93	1662.00
3	379.58	1661.70
4	725.88	1754.48
5	729.65	1762.58
6	747.00	1799.77
7	747.00	1807.77

** Corrected JANBU FOS = 1.867 ** (Fo factor = 1.045)

Failure surface No. 2 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	359.89	1674.03
2	382.51	1662.00
3	389.55	1658.71
4	713.23	1743.32
5	721.83	1761.77
6	738.65	1797.84
7	738.65	1805.84

** Corrected JANBU FOS = 1.884 ** (Fo factor = 1.052)

Failure surface No. 3 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	362.57	1674.97
2	386.50	1662.25
3	786.60	1767.92
4	786.87	1768.51
5	807.89	1813.58
6	807.89	1821.58

** Corrected JANBU FOS = 1.886 ** (Fo factor = 1.041)

Failure surface No. 4 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	371.18	1678.02
2	388.95	1668.57
3	737.64	1758.86
4	739.87	1763.64
5	757.89	1802.28
6	757.89	1810.28

** Corrected JANBU FOS = 1.891 ** (Fo factor = 1.044)

Failure surface No. 5 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	315.88	1667.00
2	353.30	1649.55
3	686.13	1737.94
4	695.99	1759.09
5	709.74	1788.58
6	709.74	1796.58

** Corrected JANBU FOS = 1.896 ** (Fo factor = 1.049)

Failure surface No. 6 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	381.26	1681.58
2	398.97	1672.16
3	693.34	1750.29
4	697.51	1759.25
5	711.46	1789.15
6	711.46	1797.15

** Corrected JANBU FOS = 1.897 ** (Fo factor = 1.046)

Failure surface No. 7 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	358.23	1673.44
2	379.76	1662.00
3	391.77	1656.40
4	773.86	1758.22
5	778.24	1767.61
6	798.81	1811.72
7	798.81	1819.72

** Corrected JANBU FOS = 1.898 ** (Fo factor = 1.046)

Failure surface No. 8 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	368.73	1677.15
2	397.23	1662.00
3	398.81	1661.27
4	779.79	1759.68
5	783.75	1768.18
6	804.61	1812.92
7	804.61	1820.92

W.O. 8838
Sec. M-M' W=60'D=5'

** Corrected JANBU FOS = 1.904 ** (Fo factor = 1.046)

Failure surface No. 9 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	320.11	1667.00
2	355.68	1650.42
3	680.39	1733.57
4	692.10	1758.69
5	705.36	1787.12
6	705.36	1795.12

** Corrected JANBU FOS = 1.912 ** (Fo factor = 1.051)

Failure surface No.10 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	346.91	1669.44
2	360.90	1662.00
3	374.99	1655.43
4	691.07	1734.08
5	703.08	1759.82
6	717.73	1791.24
7	717.73	1799.24

** Corrected JANBU FOS = 1.914 ** (Fo factor = 1.054)

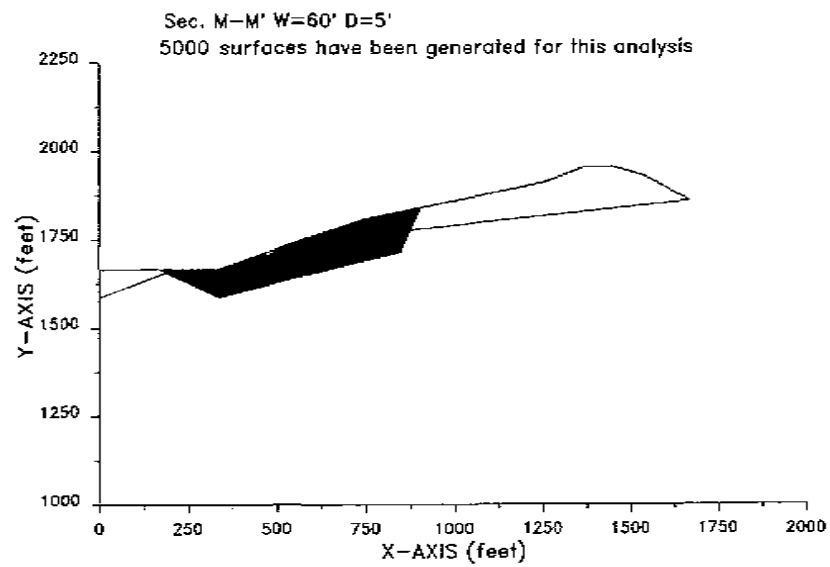
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. M-M' W=60' D=5'

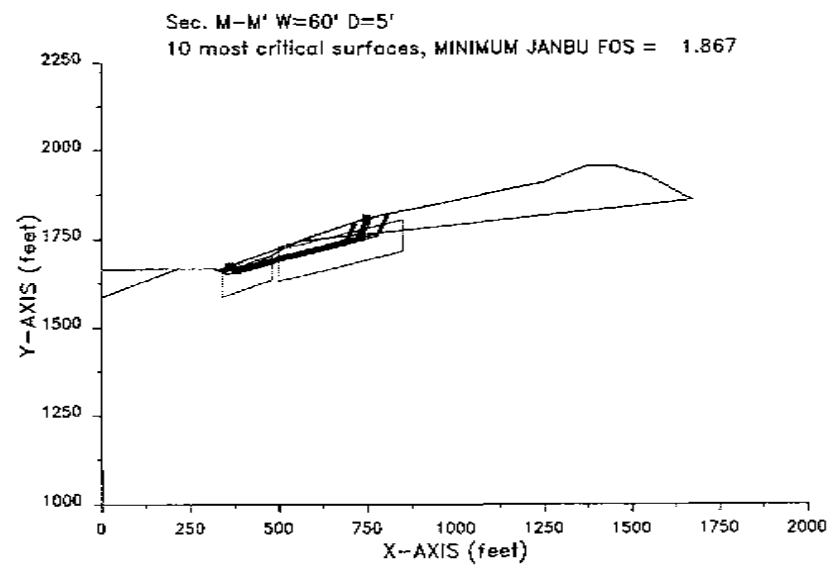
	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.867	1.045	357.74	747.00	8.616E+05
2.	1.884	1.052	359.89	738.65	9.731E+05
3.	1.886	1.041	362.57	807.89	1.079E+06
4.	1.891	1.044	371.18	757.89	8.147E+05
5.	1.896	1.049	315.88	709.74	9.120E+05
6.	1.897	1.046	381.26	711.46	6.304E+05
7.	1.898	1.046	358.23	798.81	1.234E+06
8.	1.904	1.046	368.73	804.61	1.190E+06
9.	1.912	1.051	320.11	705.36	9.222E+05
10.	1.914	1.054	346.91	717.73	9.568E+05

* * END OF FILE * * *

8838M 11-22-** 12:03



8838M 11-22-** 12:03



W.O. 8838

Sec. M-M' Pseudostatic

XSTABL File: B838MP 11-22-** 12:03

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*          Copyright (C) 1992 Â 96      *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Â 1545  *
*****************************************
```

Problem Description : Sec. M-M' W=60' D=5' Pseudo

SEGMENT BOUNDARY COORDINATES

11 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1665.0	215.0	1667.0	1
2	215.0	1667.0	340.0	1667.0	2
3	340.0	1667.0	490.0	1720.0	1
4	490.0	1720.0	570.0	1750.0	1
5	570.0	1750.0	735.0	1805.0	1
6	735.0	1805.0	800.0	1820.0	3
7	800.0	1820.0	1250.0	1910.0	3
8	1250.0	1910.0	1370.0	1955.0	3
9	1370.0	1955.0	1450.0	1955.0	3
10	1450.0	1955.0	1540.0	1930.0	3
11	1540.0	1930.0	1670.0	1860.0	3

6 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1585.0	215.0	1667.0	2
2	340.0	1667.0	340.1	1662.0	2
3	340.1	1662.0	400.0	1662.0	2
4	400.0	1662.0	560.0	1745.0	2
5	560.0	1745.0	735.0	1805.0	3
6	560.0	1745.0	1670.0	1860.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	135.0	200.0	34.00	.000	.0	0
2	130.0	140.0	200.0	40.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	200.0	40.00
2	15.00	100.0	25.00
3	90.00	200.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	5.00	225.0	40.00
2	10.00	100.0	25.00
3	90.00	225.0	40.00

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

W.O. 8838
Sec. M-M' Pseudostatic

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	340.0	1620.0	480.0	1670.0	70.0
2	500.0	1675.0	850.0	1760.0	90.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	362.57	1674.97
2	386.50	1662.25
3	786.60	1767.92
4	786.87	1768.51
5	807.89	1813.58
6	807.89	1821.58

** Corrected JANBU FOS = 1.213 ** (Fo factor = 1.041)

Failure surface No. 2 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	357.74	1673.27
2	378.93	1662.00
3	379.58	1661.70
4	725.88	1754.48
5	729.65	1762.58
6	747.00	1799.77
7	747.00	1807.77

** Corrected JANBU FOS = 1.219 ** (Fo factor = 1.045)

Failure surface No. 3 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	371.18	1678.02
2	388.95	1668.57
3	737.64	1758.86
4	739.87	1763.64
5	757.89	1802.28
6	757.89	1810.28

** Corrected JANBU FOS = 1.226 ** (Fo factor = 1.044)

Failure surface No. 4 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	368.73	1677.15
2	397.23	1662.00
3	398.81	1661.27
4	779.79	1759.68
5	783.75	1768.18
6	804.61	1812.92
7	804.61	1820.92

** Corrected JANBU FOS = 1.226 ** (Fo factor = 1.045)

Failure surface No. 5 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	361.09	1674.45
2	378.93	1664.97
3	781.95	1767.43
4	782.23	1768.02
5	803.01	1812.60
6	803.01	1820.60

** Corrected JANBU FOS = 1.226 ** (Fo factor = 1.041)

Failure surface No. 6 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	342.95	1668.04
2	354.32	1662.00
3	364.25	1657.37
4	814.59	1770.17
5	815.18	1771.44
6	837.50	1819.52
7	837.50	1827.52

** Corrected JANBU FOS = 1.227 ** (Fo factor = 1.040)

Failure surface No. 7 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	342.56	1667.90
2	353.67	1662.00
3	371.85	1653.52
4	807.67	1765.38
5	811.24	1771.03
6	833.47	1818.69
7	833.47	1826.69

** Corrected JANBU FOS = 1.229 ** (Fo factor = 1.043)

Failure surface No. 8 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)

W.O. 8838
Sec. M-M' Pseudostatic

1	358.23	1673.44
2	379.76	1662.00
3	391.77	1656.40
4	773.86	1758.22
5	778.24	1767.61
6	798.81	1811.72
7	798.81	1819.72

** Corrected JANBU FOS = 1.232 ** (Fo factor = 1.046)

Failure surface No. 9 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	359.89	1674.03
2	382.51	1662.00
3	389.55	1658.71
4	713.23	1743.32
5	721.83	1761.77
6	738.55	1797.84
7	738.65	1805.84

** Corrected JANBU FOS = 1.235 ** (Fo factor = 1.052)

Failure surface No.10 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	341.46	1667.51
2	351.83	1662.00
3	369.44	1653.79
4	824.98	1775.03
5	846.56	1821.31
6	846.56	1829.31

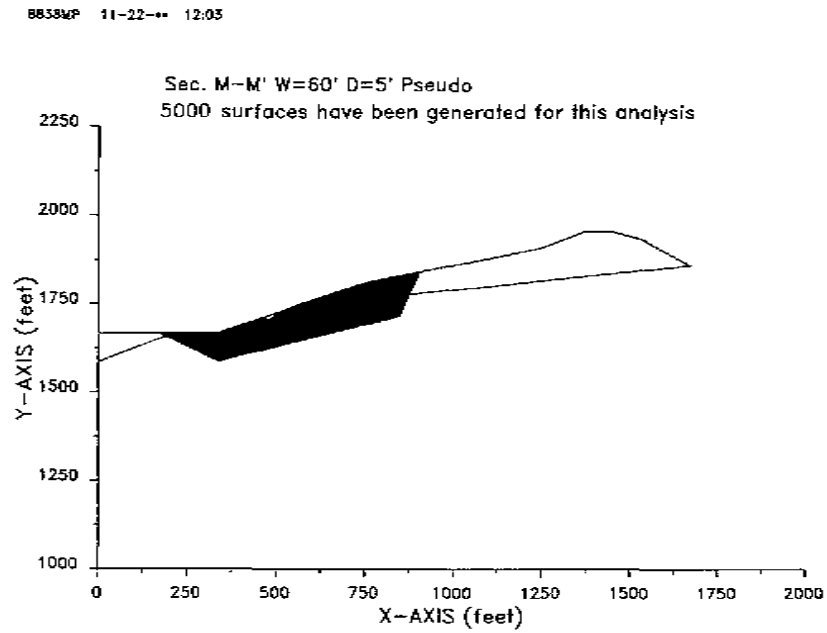
** Corrected JANBU FOS = 1.235 ** (Fo factor = 1.037)

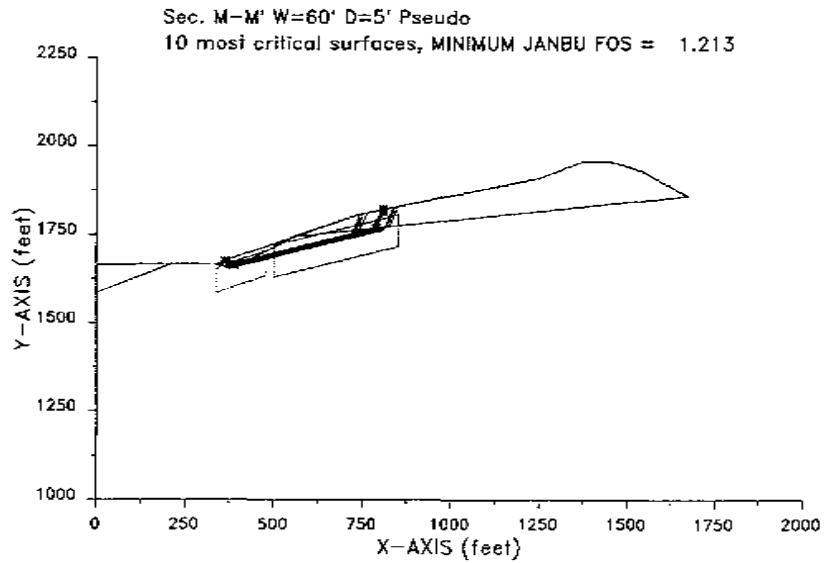
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. M-M' W=60' D=5' Pseudo

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.213	1.041	362.57	807.89	1.033E+06
2.	1.219	1.045	357.74	747.00	8.232E+05
3.	1.226	1.044	371.18	757.89	7.772E+05
4.	1.226	1.046	368.73	804.61	1.141E+06
5.	1.226	1.041	361.09	803.01	9.596E+05
6.	1.227	1.040	342.95	837.60	1.204E+06
7.	1.229	1.043	342.56	833.47	1.338E+06
8.	1.232	1.046	358.23	798.81	1.188E+06
9.	1.235	1.052	359.89	738.65	9.338E+05
10.	1.235	1.037	341.46	846.56	1.296E+06

* * * END OF FILE * * *





W.O. 8838
Sec. M-M' Backcut

XSTABL File: 8838MB 11-22-** 12:04

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*         Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Â 1545  *
*****************************************
```

Problem Description : Sec. M-M' Backcut

SEGMENT BOUNDARY COORDINATES

12 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1665.0	215.0	1667.0	1
2	215.0	1667.0	340.0	1667.0	2
3	340.0	1667.0	340.1	1662.0	2
4	340.1	1662.0	400.0	1662.0	2
5	400.0	1662.0	560.0	1745.0	2
6	560.0	1745.0	735.0	1805.0	3
7	735.0	1805.0	800.0	1820.0	3
8	800.0	1820.0	1250.0	1910.0	3
9	1250.0	1910.0	1370.0	1955.0	3
10	1370.0	1955.0	1450.0	1955.0	3
11	1450.0	1955.0	1540.0	1930.0	3
12	1540.0	1930.0	1670.0	1860.0	3

2 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1585.0	215.0	1667.0	2
2	560.0	1745.0	1670.0	1860.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	135.0	200.0	34.00	.000	.0	0
2	130.0	140.0	200.0	40.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	200.0	40.00
2	15.00	100.0	25.00
3	90.00	200.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	5.00	225.0	40.00
2	10.00	100.0	25.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box	x-left	y-left	x-right	y-right	Width

no.	(ft)	(ft)	(ft)	(ft)	(ft)
1	400.0	1620.0	480.0	1655.0	70.0
2	500.0	1670.0	850.0	1760.0	70.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	415.01	1669.79
2	424.13	1665.54
3	598.98	1710.87
4	617.68	1750.98
5	620.90	1757.88
6	620.90	1765.88

** Corrected JANBU FOS = 1.630 ** (Fo factor = 1.067)

Failure surface No. 2 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	395.72	1662.00
2	406.06	1657.18
3	615.20	1710.31
4	635.00	1752.77
5	640.52	1764.51
6	640.52	1772.51

** Corrected JANBU FOS = 1.631 ** (Fo factor = 1.065)

Failure surface No. 3 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	400.11	1662.06
2	413.07	1656.01
3	619.95	1709.89
4	640.20	1753.31
5	646.41	1766.63
6	646.41	1774.63

** Corrected JANBU FOS = 1.639 ** (Fo factor = 1.067)

Failure surface No. 4 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	421.96	1673.39
2	433.81	1667.87
3	615.40	1715.79
4	632.53	1752.51
5	637.72	1763.65
6	637.72	1771.65

** Corrected JANBU FOS = 1.654 ** (Fo factor = 1.066)

Failure surface No. 5 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	411.88	1668.16
2	425.42	1661.85
3	648.04	1720.14
4	664.69	1755.85
5	674.15	1776.14
6	674.15	1784.14

** Corrected JANBU FOS = 1.662 ** (Fo factor = 1.064)

Failure surface No. 6 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	404.20	1664.18
2	418.36	1657.37
3	686.51	1727.16
4	701.68	1759.68
5	716.05	1790.50
6	716.05	1798.50

** Corrected JANBU FOS = 1.668 ** (Fo factor = 1.062)

Failure surface No. 7 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	406.33	1665.29
2	425.37	1656.41
3	691.27	1726.74
4	706.88	1760.22
5	721.94	1792.52
6	721.94	1800.52

** Corrected JANBU FOS = 1.682 ** (Fo factor = 1.063)

Failure surface No. 8 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	403.97	1664.06
2	424.50	1654.48
3	563.00	1690.66
4	589.29	1747.04
5	589.29	1755.04

** Corrected JANBU FOS = 1.686 ** (Fo factor = 1.077)

Failure surface No. 9 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	403.33	1663.73

W.O. 8838
Sec. M-M' Backcut

2	412.70	1659.35
3	676.02	1723.80
4	692.30	1758.71
5	705.43	1786.86
6	705.43	1794.86

** Corrected JANBU FOS = 1.687 ** (Fo factor = 1.063)

Failure surface No.10 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	404.63	1664.40
2	414.52	1659.79
3	547.85	1686.59
4	573.52	1741.64
5	573.52	1749.64

** Corrected JANBU FOS = 1.688 ** (Fo factor = 1.079)

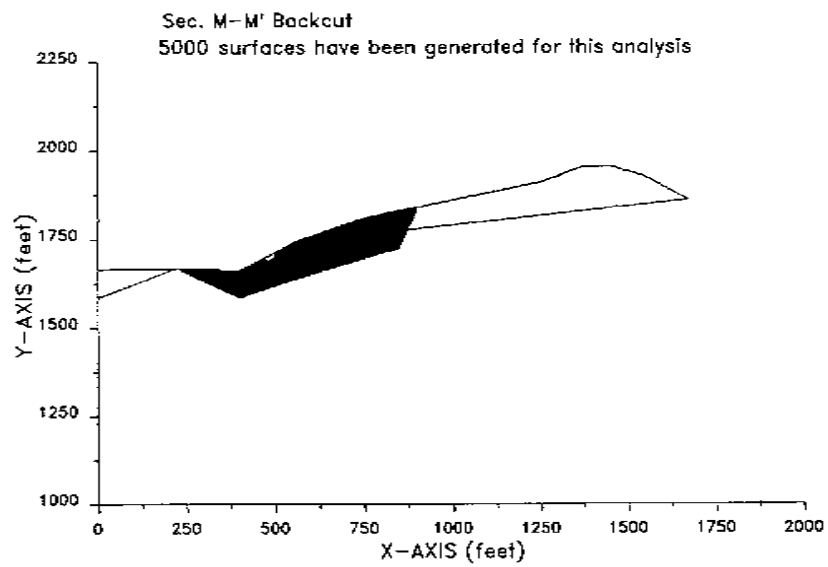
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. M-M' Backcut

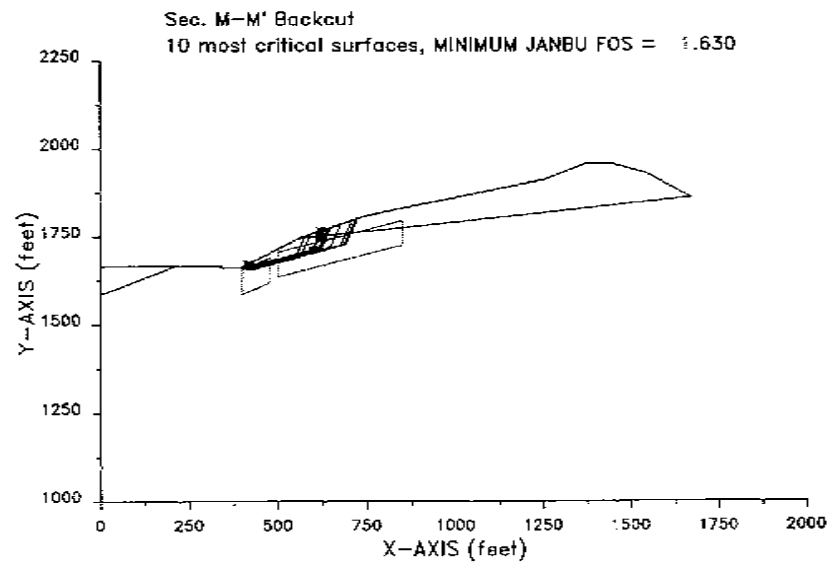
	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.630	1.067	415.01	620.90	4.166E+05
2.	1.631	1.065	395.72	640.52	5.440E+05
3.	1.639	1.067	400.11	646.41	5.989E+05
4.	1.654	1.066	421.96	637.72	4.635E+05
5.	1.662	1.064	411.88	674.15	6.475E+05
6.	1.668	1.062	404.20	716.05	8.532E+05
7.	1.682	1.063	406.33	721.94	9.235E+05
8.	1.686	1.077	403.97	589.29	4.648E+05
9.	1.687	1.063	403.33	705.43	7.904E+05
10.	1.688	1.079	404.63	573.52	3.640E+05

* * * END OF FILE * * *

8838MB 11-22-** 12:04



8838MB 11-22-** 12:04



W.O. 8838
Sec. N-N'

XSTABL File: 8838N 11-20-** 14:49

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Ã 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Ã 1545  *
*****************************************
```

Problem Description : Sec. N-N' W=80' D=5'/W=50' D=5'

SEGMENT BOUNDARY COORDINATES

11 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1625.0	160.0	1625.0	1
2	160.0	1625.0	370.0	1710.0	2
3	370.0	1710.0	390.0	1710.0	2
4	390.0	1710.0	710.0	1838.0	2
5	710.0	1838.0	770.0	1840.0	2
6	770.0	1840.0	975.0	1900.0	1
7	975.0	1900.0	1080.0	1860.0	1
8	1080.0	1860.0	1150.0	1858.0	1
9	1150.0	1858.0	1170.0	1850.0	1
10	1170.0	1850.0	1190.0	1840.0	1
11	1190.0	1840.0	1215.0	1820.0	3

8 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	160.0	1625.0	160.1	1620.0	1
2	160.1	1620.0	240.0	1620.0	3
3	240.0	1620.0	390.0	1705.0	3
4	390.0	1705.0	440.0	1705.0	3
5	440.0	1705.0	540.0	1755.0	3
6	540.0	1755.0	670.0	1815.0	1
7	670.0	1815.0	770.0	1840.0	1
8	540.0	1755.0	1190.0	1840.0	3

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	200.0	40.00	.000	.0	0

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between x = 155.0 ft
and x = 165.0 ft

Each surface terminates between x = 700.0 ft
and x = 1080.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

24.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface

W.O. 8838
Sec. N-N'

is specified by 24 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	160.56	1625.22
2	183.75	1631.40
3	206.88	1637.79
4	229.96	1644.38
5	252.97	1651.19
6	275.92	1658.20
7	298.81	1665.43
8	321.63	1672.86
9	344.39	1680.49
10	367.07	1688.33
11	389.68	1696.38
12	412.22	1704.63
13	434.68	1713.09
14	457.06	1721.75
15	479.36	1730.61
16	501.59	1739.68
17	523.73	1748.94
18	545.78	1758.41
19	567.75	1768.07
20	589.63	1777.94
21	611.42	1788.00
22	633.11	1798.26
23	644.82	1803.93
24	644.82	1811.93

**** Simplified BISHOP FOS = 2.263 ****

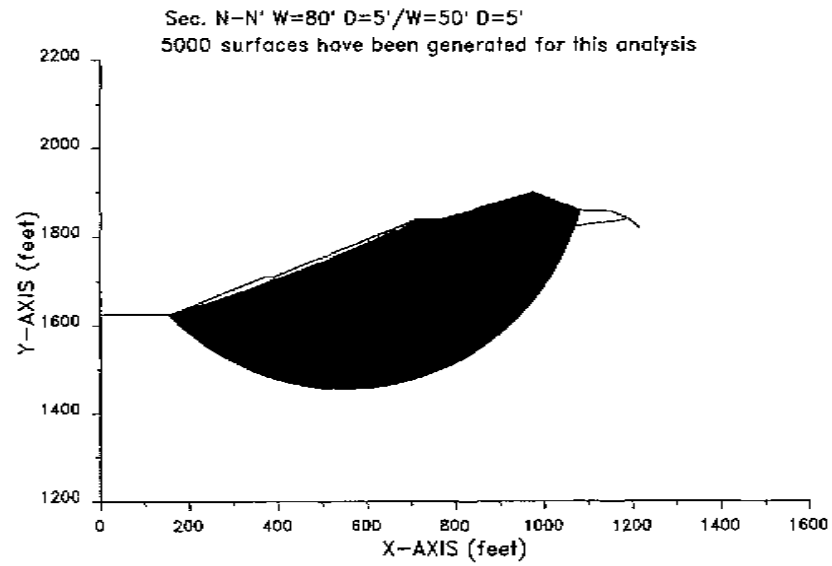
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. N-N' W=80' D=5'/W=50' D=5'

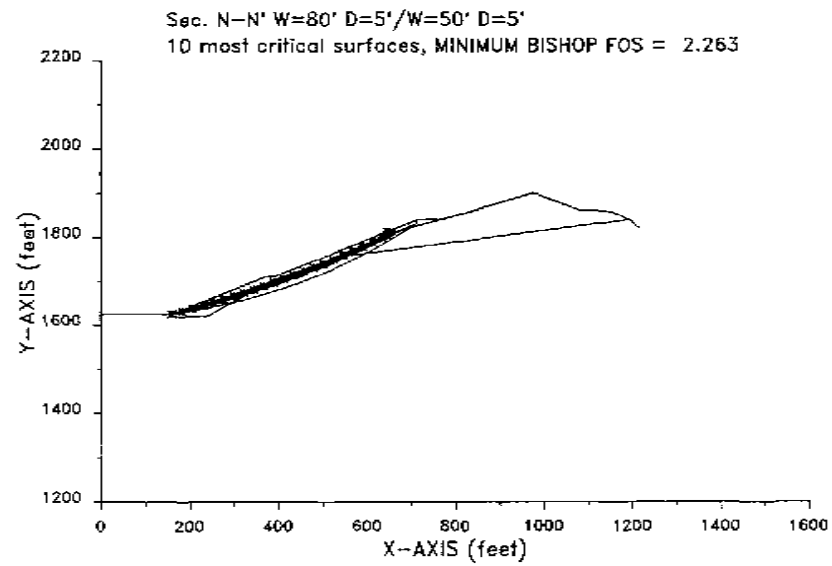
	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	2.263	-508.49	4183.95	2644.75	160.56	644.82	1.634E+09
2.	2.299	-588.84	4389.77	2863.88	163.89	626.93	1.538E+09
3.	2.331	-876.05	5200.47	3722.24	162.78	660.82	1.991E+09
4.	2.338	-1050.82	5659.96	4212.66	150.56	652.38	2.047E+09
5.	2.353	-1018.43	5569.72	4116.59	163.89	640.33	1.909E+09
6.	2.361	-444.99	4085.17	2532.87	163.89	701.18	2.146E+09
7.	2.363	-304.50	3649.48	2076.80	161.67	657.96	1.694E+09
8.	2.367	-272.55	3565.27	1987.02	165.00	654.76	1.621E+09
9.	2.379	-280.74	3632.79	2055.10	162.78	693.97	2.018E+09
10.	2.381	-3.91	2913.85	1298.17	163.89	710.53	2.043E+09

* * * END OF FILE * * *

8838N 11-20-** 14:49



8838N 11-20-** 14:49



W.O. 8838
Sec. N-N' Pseudo.

XSTABL File: 8838NP 11-20-** 14:50

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Ã 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 Ã 1545  *
*****************************************
```

Problem Description : Sec. N-N' W=80' D=5'/W=50' D=5' Pse

SEGMENT BOUNDARY COORDINATES

11 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1625.0	160.0	1625.0	1
2	160.0	1625.0	370.0	1710.0	2
3	370.0	1710.0	390.0	1710.0	2
4	390.0	1710.0	710.0	1838.0	2
5	710.0	1838.0	770.0	1840.0	2
6	770.0	1840.0	975.0	1900.0	1
7	975.0	1900.0	1080.0	1860.0	1
8	1080.0	1860.0	1150.0	1858.0	1
9	1150.0	1858.0	1170.0	1850.0	1
10	1170.0	1850.0	1190.0	1840.0	1
11	1190.0	1840.0	1215.0	1820.0	3

8 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	160.0	1625.0	160.1	1620.0	1
2	160.1	1620.0	240.0	1620.0	3
3	240.0	1620.0	390.0	1705.0	3
4	390.0	1705.0	440.0	1705.0	3
5	440.0	1705.0	540.0	1755.0	3
6	540.0	1755.0	670.0	1815.0	1
7	670.0	1815.0	770.0	1840.0	1
8	540.0	1755.0	1190.0	1840.0	3

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	200.0	40.00	.000	.0	0

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between x = 155.0 ft
and x = 165.0 ft

Each surface terminates between x = 700.0 ft
and x = 1080.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

24.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

W.O. 8838
Sec. N-N' Pseudo.

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 24 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	160.56	1625.22
2	183.75	1631.40
3	206.88	1637.79
4	229.96	1644.38
5	252.97	1651.19
6	275.92	1658.20
7	298.81	1665.43
8	321.63	1672.86
9	344.39	1680.49
10	367.07	1688.33
11	389.68	1696.38
12	412.22	1704.63
13	434.68	1713.09
14	457.06	1721.75
15	479.36	1730.61
16	501.59	1739.68
17	523.73	1748.94
18	545.78	1758.41
19	567.75	1768.07
20	589.63	1777.94
21	611.42	1788.00
22	633.11	1798.26
23	644.82	1803.93
24	644.82	1811.93

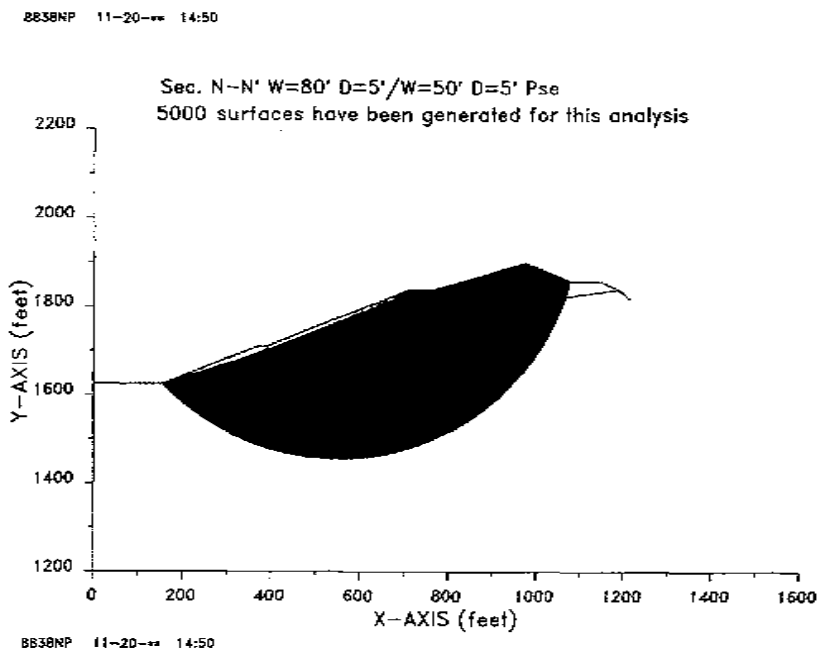
**** Simplified BISHOP FOS = 1.541 ****

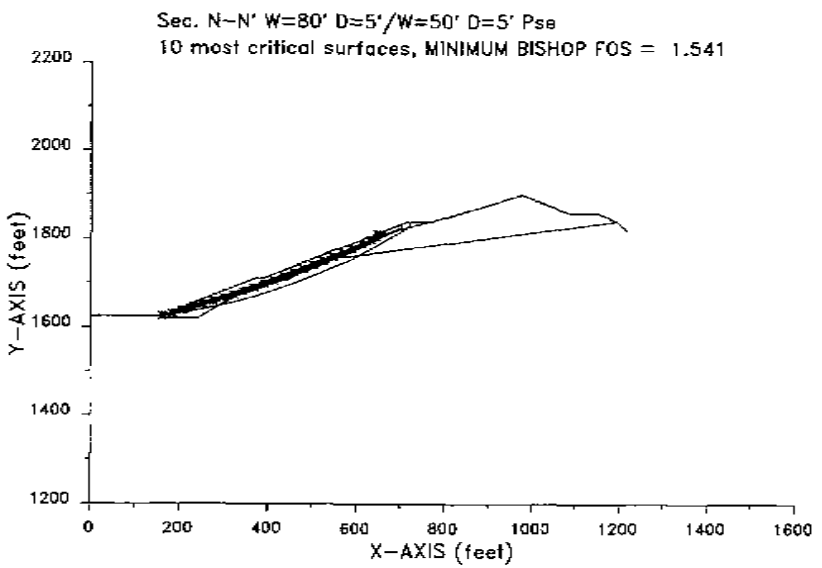
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. N-N' W=80' D=5'/W=50' D=5' Pse

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.541	-508.49	4183.95	2644.75	160.56	644.82	1.556E+09
2.	1.565	-588.84	4389.77	2863.88	163.89	626.93	1.468E+09
3.	1.590	-876.05	5200.47	3722.24	162.78	660.82	1.902E+09
4.	1.596	-1050.82	5659.96	4212.66	160.56	652.38	1.957E+09
5.	1.606	-1018.43	5569.72	4116.59	163.89	640.33	1.826E+09
6.	1.606	-304.50	3649.48	2075.80	161.67	657.96	1.611E+09
7.	1.607	-444.99	4085.17	2532.87	163.89	701.18	2.040E+09
8.	1.608	-272.55	3565.27	1987.02	165.00	654.76	1.541E+09
9.	1.618	-280.74	3632.79	2055.10	162.78	693.97	1.916E+09
10.	1.619	-9.79	2958.00	1343.62	160.56	720.79	2.204E+09

* * * END OF FILE * * *





GEOLABS-WESTLAKE VILLAGE

Plate Np.2

W.O. 8838
Sec. N-N' Backcut

XSTABL File: 8838NB 11-20-** 14:53

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*         Copyright (C) 1992 À 96       *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 À 1545   *
*****************************************
```

Problem Description : Sec. N-N' Backcut

SEGMENT BOUNDARY COORDINATES
---

13 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1625.0	160.0	1625.0	1
2	160.0	1625.0	160.1	1620.0	1
3	160.1	1620.0	240.0	1620.0	1
4	240.0	1620.0	390.0	1705.0	1
5	390.0	1705.0	440.0	1705.0	1
6	440.0	1705.0	540.0	1755.0	1
7	540.0	1755.0	670.0	1820.0	1
8	670.0	1820.0	770.0	1840.0	1
9	770.0	1840.0	975.0	1900.0	1
10	975.0	1900.0	1150.0	1858.0	1
11	1150.0	1858.0	1170.0	1850.0	1
12	1170.0	1850.0	1190.0	1840.0	1
13	1190.0	1840.0	1215.0	1820.0	3

1 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	540.0	1755.0	1190.0	1840.0	3

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

---
ISOTROPIC Soil Parameters
---

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	200.0	40.00	.000	.0	0

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between x = 240.0 ft
and x = 240.0 ft

Each surface terminates between x = 600.0 ft
and x = 1080.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

26.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 22 coordinate points

Point No.	x-surf (ft)	y-surf (ft)

W.O. 8838
Sec. N-N' Backcut

1	240.00	1620.00
2	265.52	1624.97
3	290.92	1630.55
4	316.17	1636.73
5	341.27	1643.50
6	356.20	1650.87
7	390.96	1658.84
8	415.51	1667.38
9	439.86	1676.51
10	463.98	1686.22
11	487.86	1696.49
12	511.49	1707.33
13	534.86	1718.73
14	557.95	1730.68
15	580.75	1743.18
16	603.25	1756.21
17	625.43	1769.78
18	647.28	1783.87
19	668.79	1798.47
20	689.95	1813.58
21	694.33	1816.87
22	694.33	1824.87

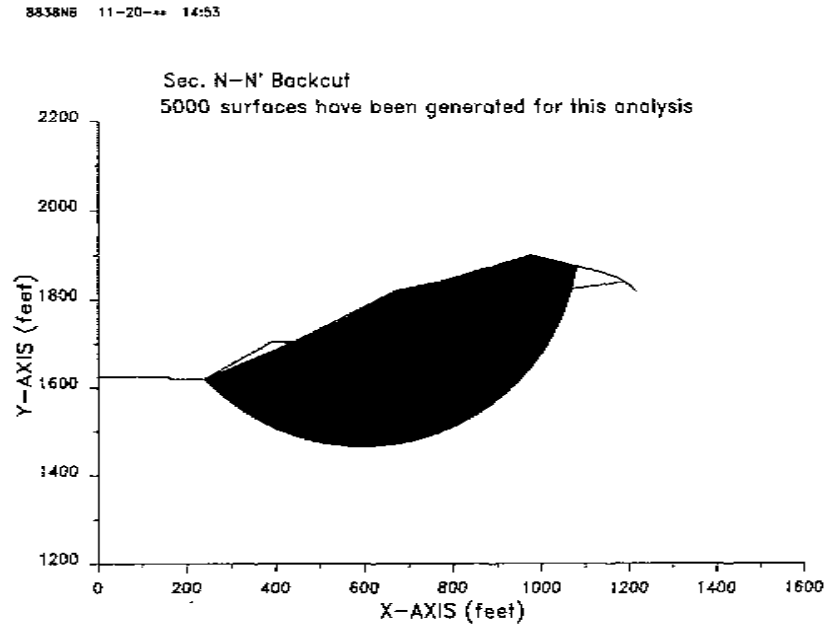
**** Simplified BISHOP FOS = 2.150 ****

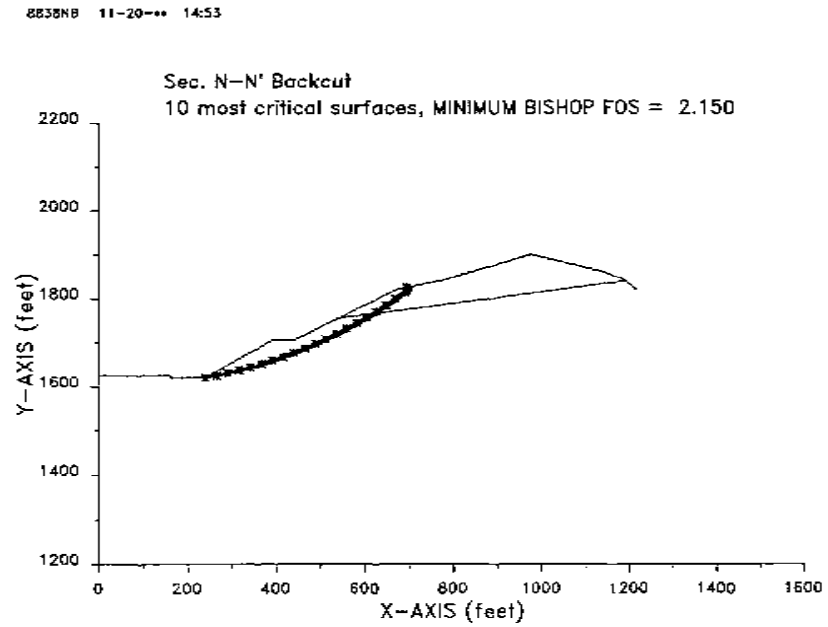
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. N-N' Backcut

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	2.150	43.56	2696.38	1094.16	240.00	694.33	1.557E+09
2.	2.151	42.87	2694.71	1092.64	240.00	693.04	1.539E+09
3.	2.151	25.69	2738.91	1139.25	240.00	694.88	1.584E+09
4.	2.151	42.03	2718.46	1116.15	240.00	701.96	1.672E+09
5.	2.151	41.32	2692.18	1090.43	240.00	690.52	1.504E+09
6.	2.151	20.36	2747.47	1148.57	240.00	693.41	1.567E+09
7.	2.153	70.66	2613.11	1007.44	240.00	685.52	1.408E+09
8.	2.153	107.61	2553.06	942.41	240.00	696.36	1.522E+09
9.	2.153	70.59	2610.33	1004.72	240.00	684.22	1.391E+09
10.	2.153	86.23	2623.69	1015.40	240.00	705.56	1.673E+09

* * * END OF FILE * * *





W.O. 8838
Sec. P-P'

XSTABL File: 8838P 11-20-** 16:10

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 Ã 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 Ã 1545  *
*****************************************
```

Problem Description : Sec. P-P' W=80'D=5'/W=50' D=5'

SEGMENT BOUNDARY COORDINATES

14 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1650.0	100.0	1600.0	1
2	100.0	1600.0	205.0	1600.0	1
3	205.0	1600.0	435.0	1695.0	2
4	435.0	1695.0	455.0	1695.0	2
5	455.0	1695.0	680.0	1795.0	2
6	680.0	1795.0	700.0	1795.0	2
7	700.0	1795.0	840.0	1843.0	3
8	840.0	1843.0	990.0	1900.0	3
9	990.0	1900.0	1092.0	1920.0	3
10	1092.0	1920.0	1150.0	1915.0	3
11	1150.0	1915.0	1228.0	1880.0	3
12	1228.0	1880.0	1310.0	1900.0	3
13	1310.0	1900.0	1358.0	1900.0	3
14	1358.0	1900.0	1415.0	1910.0	3

7 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	205.0	1600.0	205.1	1595.0	1
2	205.1	1595.0	285.0	1595.0	1
3	285.0	1595.0	455.0	1690.0	1
4	455.0	1690.0	505.0	1690.0	1
5	505.0	1690.0	640.0	1760.0	1
6	640.0	1760.0	700.0	1795.0	3
7	640.0	1760.0	1415.0	1840.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	200.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between x = 205.0 ft
and x = 205.0 ft

Each surface terminates between x = 680.0 ft
and x = 1150.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

32.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

W.O. 8838
Sec. P-P'

The most critical circular failure surface is specified by 19 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	205.00	1600.00
2	236.12	1607.44
3	267.11	1615.44
4	297.94	1623.99
5	328.62	1633.09
6	359.13	1642.74
7	389.46	1652.94
8	419.61	1663.67
9	449.56	1674.95
10	479.30	1686.76
11	508.82	1699.10
12	538.12	1711.97
13	567.19	1725.36
14	596.01	1739.27
15	624.57	1753.69
16	652.87	1768.62
17	680.90	1784.06
18	686.03	1787.00
19	686.03	1795.00

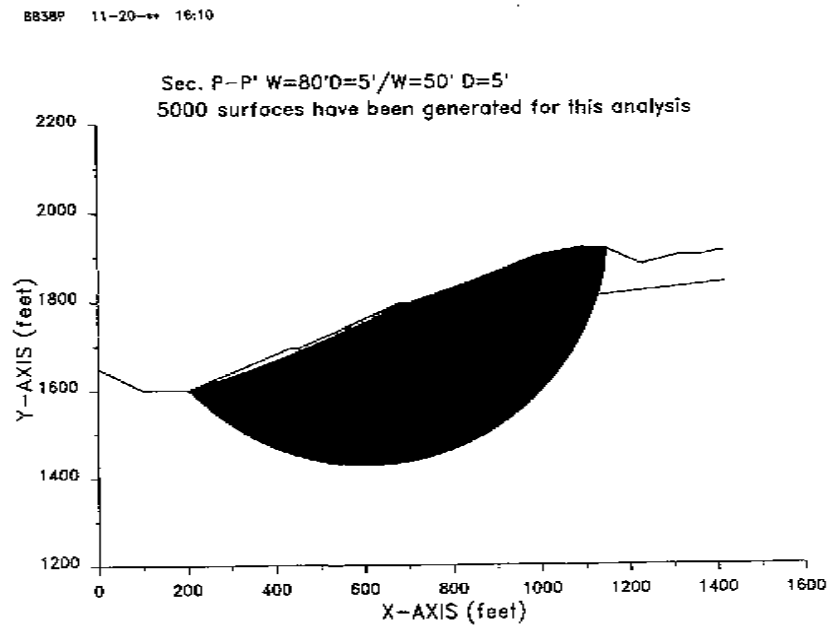
**** Simplified BISHOP FOS = 2.100 ****

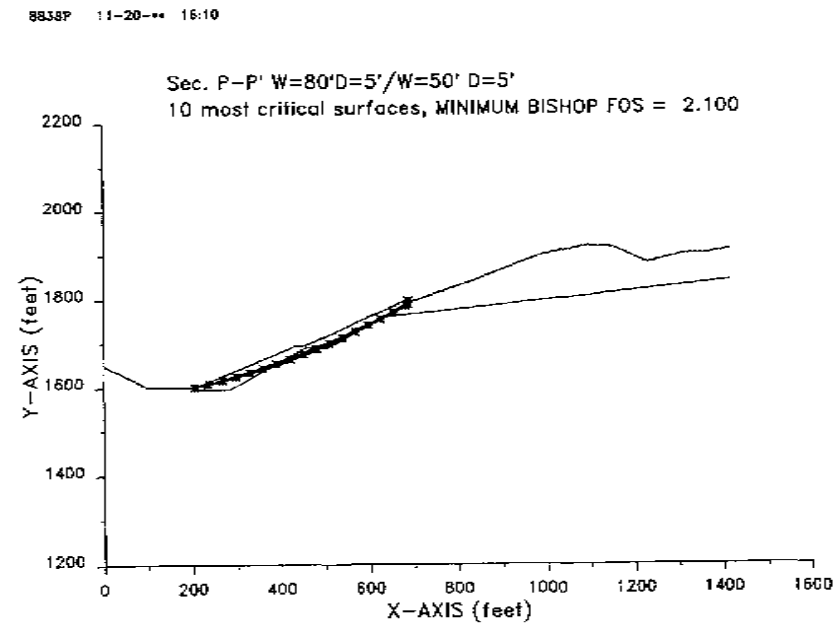
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. P-P' W=80'D=5'/W=50' D=5'

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	2.100	-194.83	3341.14	1786.45	205.00	686.03	1.401E+09
2.	2.100	-164.18	3258.13	1698.73	205.00	685.11	1.367E+09
3.	2.101	-91.66	3066.30	1496.01	205.00	683.80	1.312E+09
4.	2.105	-71.22	3006.52	1433.39	205.00	681.96	1.269E+09
5.	2.106	-238.41	3443.73	1896.30	205.00	684.14	1.375E+09
6.	2.108	-219.48	3385.83	1835.58	205.00	682.21	1.323E+09
7.	2.111	-68.46	2989.16	1415.82	205.00	677.96	1.217E+09
8.	2.113	-326.59	3671.02	2138.15	205.00	684.37	1.420E+09
9.	2.115	-201.34	3366.08	1812.22	205.00	687.72	1.455E+09
10.	2.116	-358.70	3755.87	2228.35	205.00	684.83	1.447E+09

* * * END OF FILE * * *





W.O. 8838

Sec. P-P' Pseudostatic

XSTABL File: 8838PP 11-20-** 16:11

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*         Copyright (C) 1992 A 96       *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 A 1545  *
*****************************************
```

Problem Description : Sec. P-P' W=80'D=5'/W=50' D=5'Pseudo

SEGMENT BOUNDARY COORDINATES
---

14 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1650.0	100.0	1600.0	1
2	100.0	1600.0	205.0	1600.0	1
3	205.0	1600.0	435.0	1695.0	2
4	435.0	1695.0	455.0	1695.0	2
5	455.0	1695.0	680.0	1795.0	2
6	680.0	1795.0	700.0	1795.0	2
7	700.0	1795.0	840.0	1843.0	3
8	840.0	1843.0	990.0	1900.0	3
9	990.0	1900.0	1092.0	1920.0	3
10	1092.0	1920.0	1150.0	1915.0	3
11	1150.0	1915.0	1228.0	1880.0	3
12	1228.0	1880.0	1310.0	1900.0	3
13	1310.0	1900.0	1358.0	1900.0	3
14	1358.0	1900.0	1415.0	1910.0	3

7 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	205.0	1600.0	205.1	1595.0	1
2	205.1	1595.0	285.0	1595.0	1
3	285.0	1595.0	455.0	1690.0	1
4	455.0	1690.0	505.0	1690.0	1
5	505.0	1690.0	640.0	1760.0	1
6	640.0	1760.0	700.0	1795.0	3
7	640.0	1760.0	1415.0	1840.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

---
ISOTROPIC Soil Parameters
---

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	200.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between x = 205.0 ft
and x = 205.0 ft

Each surface terminates between x = 680.0 ft
and x = 1150.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

32.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

W.O. 8838
Sec. P-P' Pseudostatic

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface
is specified by 19 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	205.00	1600.00
2	236.12	1607.44
3	267.11	1615.44
4	297.94	1623.99
5	328.62	1633.09
6	359.13	1642.74
7	389.46	1652.94
8	419.61	1663.67
9	449.56	1674.95
10	479.30	1686.76
11	508.82	1699.10
12	538.12	1711.97
13	567.19	1725.36
14	596.01	1739.27
15	624.57	1753.69
16	652.87	1768.62
17	680.90	1784.06
18	686.03	1787.00
19	686.03	1795.00

**** Simplified BISHOP FOS = 1.449 ****

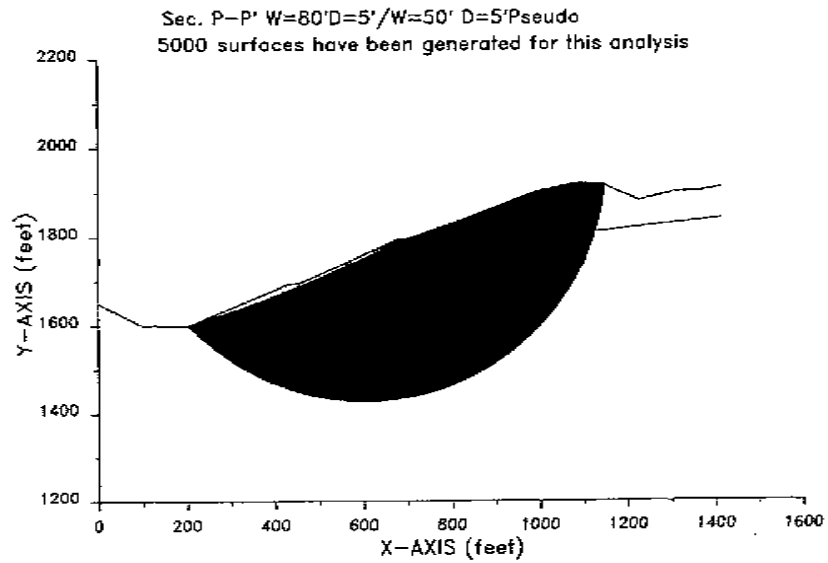
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. P-P' W=80'D=5'/W=50' D=5'Pseudo

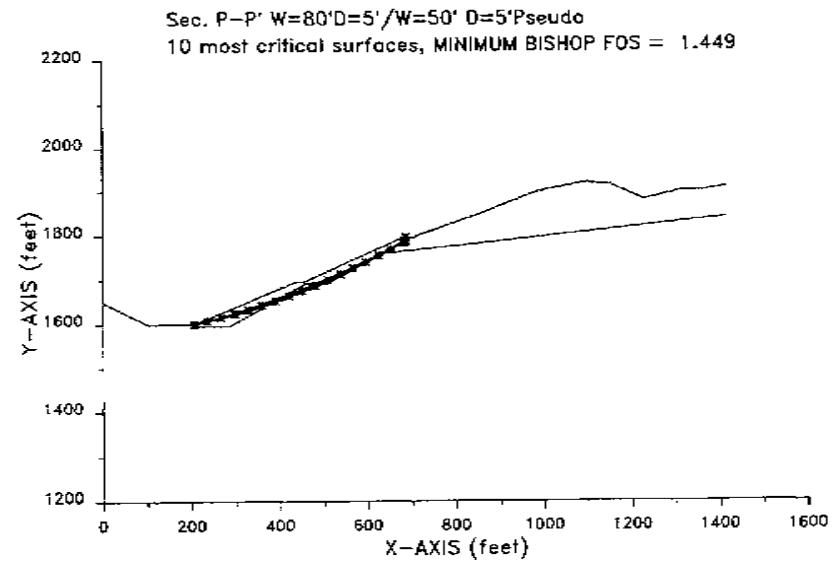
	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.449	-194.83	3341.14	1786.45	205.00	686.03	1.329E+09
2.	1.449	-164.18	3258.13	1698.73	205.00	685.11	1.297E+09
3.	1.450	-91.66	3066.30	1496.01	205.00	683.80	1.244E+09
4.	1.452	-71.22	3006.52	1433.39	205.00	681.96	1.203E+09
5.	1.453	-238.41	3443.73	1896.30	205.00	684.14	1.306E+09
6.	1.456	-219.48	3385.83	1835.58	205.00	682.21	1.256E+09
7.	1.456	-68.46	2989.16	1415.82	205.00	677.96	1.155E+09
8.	1.458	-201.34	3366.08	1812.22	205.00	687.72	1.380E+09
9.	1.460	-326.59	3671.02	2138.15	205.00	684.37	1.349E+09
10.	1.462	-358.70	3755.87	2228.35	205.00	684.83	1.375E+09

* * * END OF FILE * * *

8838PP 11-20-** 16:11



8838PP 11-20-** 16:11



W.O. 8838
Sec. P-P' Backcut

XSTABL File: 8838PB 11-20-** 16:09

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 Â 1545   *
*****************************************
```

Problem Description : Sec. P-P' Backcut

SEGMENT BOUNDARY COORDINATES

16 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1650.0	100.0	1600.0	1
2	100.0	1600.0	205.0	1600.0	1
3	205.0	1600.0	205.1	1595.0	1
4	205.1	1595.0	285.0	1595.0	1
5	285.0	1595.0	455.0	1690.0	1
6	455.0	1690.0	505.0	1690.0	1
7	505.0	1690.0	640.0	1760.0	3
8	640.0	1760.0	700.0	1795.0	3
9	700.0	1795.0	840.0	1843.0	3
10	840.0	1843.0	990.0	1900.0	3
11	990.0	1900.0	1092.0	1920.0	3
12	1092.0	1920.0	1150.0	1915.0	3
13	1150.0	1915.0	1228.0	1880.0	3
14	1228.0	1880.0	1310.0	1900.0	3
15	1310.0	1900.0	1358.0	1900.0	3
16	1358.0	1900.0	1415.0	1910.0	3

1 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	640.0	1760.0	1415.0	1840.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	200.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between x = 285.0 ft
and x = 285.0 ft

Each surface terminates between x = 680.0 ft
and x = 1150.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

33.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 19 coordinate points

W.O. 8838
Sec. P-P' Backcut

Point No.	x-surf (ft)	y-surf (ft)
1	285.00	1595.00
2	317.31	1601.70
3	349.43	1609.28
4	381.32	1617.75
5	412.97	1627.10
6	444.35	1637.31
7	475.44	1648.39
8	506.21	1660.32
9	536.63	1673.10
10	566.69	1686.71
11	596.37	1701.14
12	625.64	1716.39
13	654.47	1732.44
14	682.85	1749.28
15	710.76	1766.89
16	738.17	1785.27
17	765.06	1804.40
18	777.00	1813.40
19	777.00	1821.40

**** Simplified BISHOP FOS = 2.070 ****

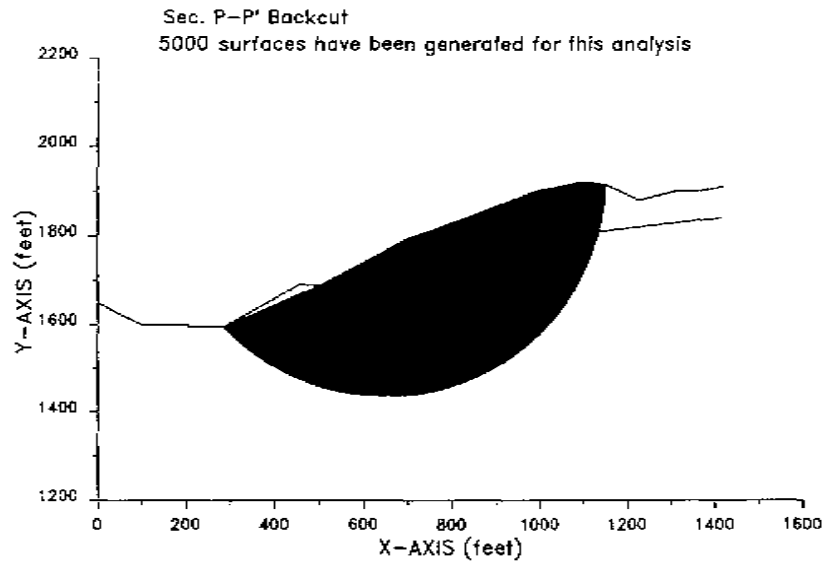
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. P-P' Backcut

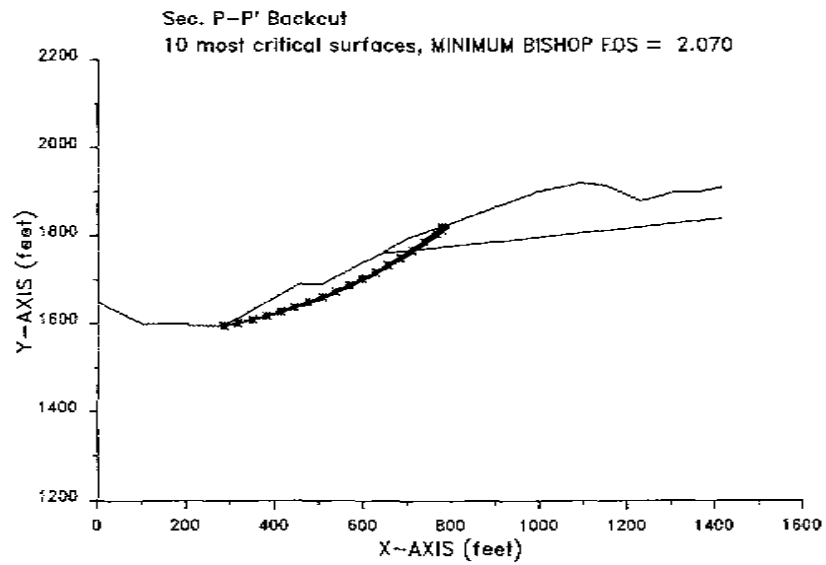
	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	2.070	58.49	2769.24	1195.89	285.00	777.00	1.947E+09
2.	2.071	62.32	2772.47	1198.34	285.00	783.68	2.030E+09
3.	2.072	52.50	2813.83	1240.81	285.00	794.63	2.187E+09
4.	2.072	28.18	2868.45	1299.09	285.00	794.35	2.213E+09
5.	2.072	10.32	2900.67	1334.25	285.00	789.64	2.171E+09
6.	2.072	104.53	2648.11	1068.46	285.00	767.15	1.774E+09
7.	2.072	103.73	2647.11	1067.61	285.00	765.61	1.755E+09
8.	2.072	103.44	2683.00	1103.04	285.00	785.69	2.010E+09
9.	2.073	89.21	2666.86	1089.60	285.00	758.33	1.681E+09
10.	2.073	117.45	2619.58	1038.19	285.00	767.42	1.765E+09

* * * END OF FILE * * *

8838PB 11-20-** 16:09



8838PB 11-20-** 16:09



W.O. 8838
Sec. R-R' W=40' D=5'

XSTABL File: 8838R 11-20-** 16:45

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Ã 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Ã 1545  *
*****************************************
```

Problem Description : Sec. R-R' W=40' D=5'

SEGMENT BOUNDARY COORDINATES

3 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1685.0	80.0	1685.0	1
2	80.0	1685.0	260.0	1761.0	1
3	260.0	1761.0	350.0	1738.0	2

4 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	80.0	1685.0	80.1	1680.0	1
2	80.1	1680.0	120.0	1680.0	1
3	120.0	1680.0	259.9	1756.0	1
4	259.9	1756.0	260.0	1761.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

5000 trial surfaces will be generated and analyzed.

100 Surfaces initiate from each of 50 points equally spaced along the ground surface between x = 80.0 ft
and x = 80.0 ft

Each surface terminates between x = 250.0 ft
and x = 330.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

6.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 35 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	80.00	1685.00
2	86.00	1685.12
3	91.99	1685.36
4	97.98	1685.74
5	103.96	1686.24
6	109.93	1686.87
7	115.88	1687.63
8	121.81	1688.52

W.O. 8838
Sec. R-R' W=40' D=5'

9	127.73	1689.53
10	133.62	1690.67
11	139.48	1691.93
12	145.32	1693.32
13	151.13	1694.84
14	156.90	1696.48
15	162.63	1698.24
16	168.33	1700.12
17	173.98	1702.13
18	179.60	1704.26
19	185.16	1706.50
20	190.67	1708.87
21	196.14	1711.35
22	201.54	1713.95
23	206.89	1716.66
24	212.19	1719.49
25	217.42	1722.43
26	222.58	1725.48
27	227.68	1728.64
28	232.71	1731.91
29	237.67	1735.29
30	242.56	1738.77
31	247.37	1742.36
32	252.10	1746.05
33	256.75	1749.84
34	260.36	1752.91
35	260.36	1760.91

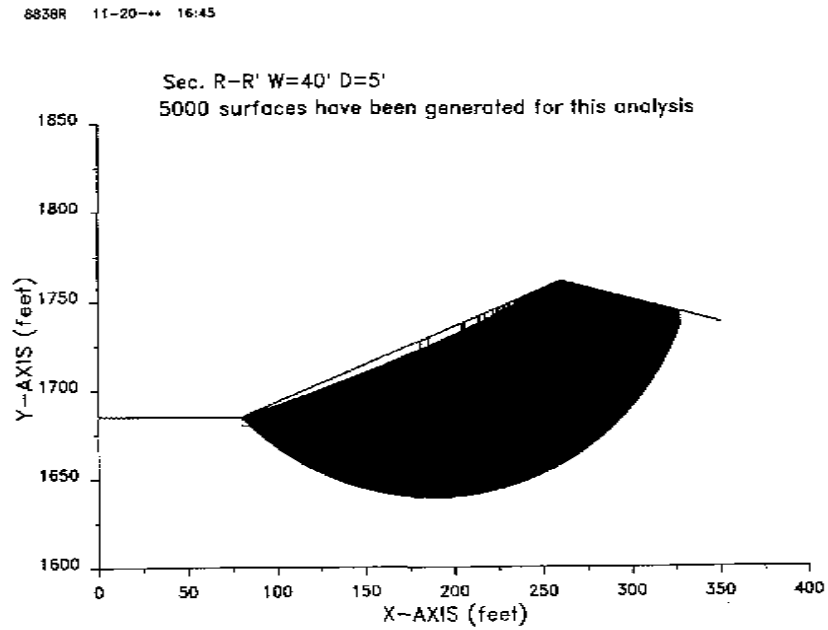
**** Simplified BISHOP FOS = 2.498 ****

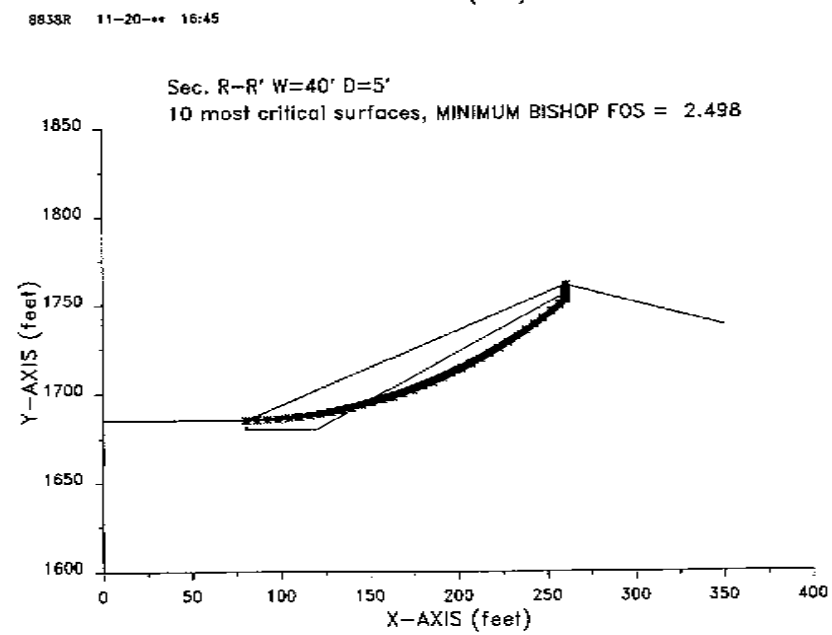
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. R-R' W=40' D=5'

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	2.498	77.49	1965.19	280.20	80.00	260.36	9.786E+07
2.	2.500	75.49	1968.06	283.10	80.00	259.05	9.590E+07
3.	2.501	80.39	1961.34	276.34	80.00	261.47	1.006E+08
4.	2.501	71.57	1972.97	293.09	80.00	258.68	9.632E+07
5.	2.502	82.85	1954.05	269.06	80.00	261.23	9.932E+07
6.	2.502	64.88	2000.02	315.38	80.00	260.71	1.022E+08
7.	2.503	62.41	2003.85	319.33	80.00	259.96	1.004E+08
8.	2.503	75.06	1967.23	282.27	80.00	257.62	9.399E+07
9.	2.504	79.22	1968.21	283.22	80.00	262.62	1.045E+08
10.	2.504	81.77	1960.84	275.84	80.00	262.39	1.032E+08

* * * END OF FILE * * *





W.O. 8838

Sec. R-R' Pseudostatic

XSTABL File: 8838RP 11-20-** 16:46

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 Â 1545   *
*****************************************
```

Problem Description : Sec. R-R' W=40' D=5' Pseudo

SEGMENT BOUNDARY COORDINATES

3 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1685.0	80.0	1685.0	1
2	80.0	1685.0	260.0	1761.0	1
3	260.0	1761.0	350.0	1738.0	2

4 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	80.0	1685.0	80.1	1680.0	1
2	80.1	1680.0	120.0	1680.0	1
3	120.0	1680.0	259.9	1756.0	1
4	259.9	1756.0	260.0	1761.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

5000 trial surfaces will be generated and analyzed.

100 Surfaces initiate from each of 50 points equally spaced along the ground surface between x = 80.0 ft
and x = 80.0 ft

Each surface terminates between x = 250.0 ft
and x = 330.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

6.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 35 coordinate points

Point No.	x-surf (ft)	y-surf (ft)

W.O. 8838
Sec. R-R' Pseudostatic

1	80.00	1685.00
2	86.00	1685.12
3	91.99	1685.36
4	97.98	1685.74
5	103.96	1686.24
6	109.93	1686.87
7	115.88	1687.63
8	121.81	1688.52
9	127.73	1689.53
10	133.62	1690.67
11	139.48	1691.93
12	145.32	1693.32
13	151.13	1694.84
14	156.90	1696.48
15	162.63	1698.24
16	168.33	1700.12
17	173.98	1702.13
18	179.60	1704.26
19	185.16	1706.50
20	190.67	1708.87
21	196.14	1711.35
22	201.54	1713.95
23	206.89	1716.66
24	212.19	1719.49
25	217.42	1722.43
26	222.58	1725.48
27	227.68	1728.64
28	232.71	1731.91
29	237.67	1735.29
30	242.56	1738.77
31	247.37	1742.36
32	252.10	1746.05
33	256.75	1749.84
34	260.36	1752.91
35	260.36	1760.91

**** Simplified BISHOP FOS = 1.744 ****

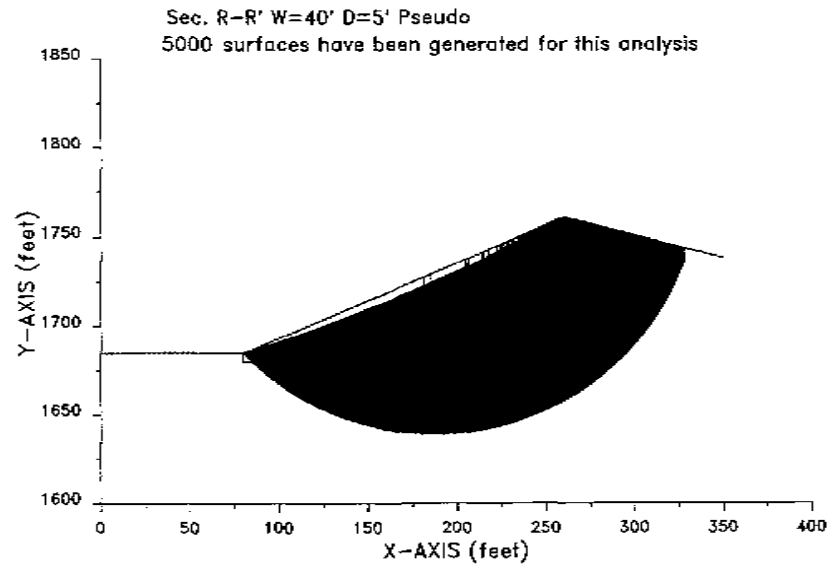
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. R-R' W=40' D=5' Pseudo

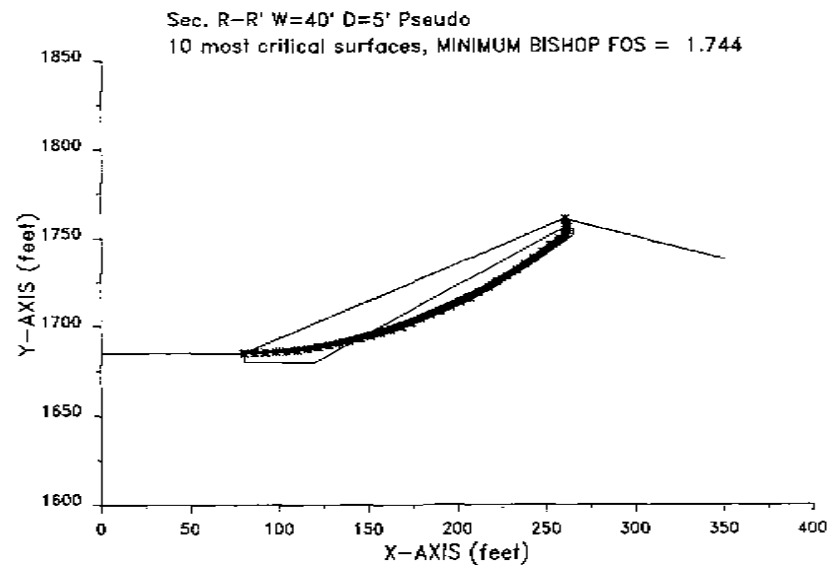
	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.744	77.49	1965.19	280.20	80.00	260.36	9.317E+07
2.	1.744	54.88	2000.02	315.38	80.00	260.71	9.730E+07
3.	1.745	80.39	1961.34	276.34	80.00	261.47	9.581E+07
4.	1.745	79.22	1968.21	283.22	80.00	262.62	9.950E+07
5.	1.745	75.49	1968.06	283.10	80.00	259.05	9.130E+07
6.	1.746	71.57	1977.97	293.09	80.00	258.68	9.170E+07
7.	1.746	62.41	2003.85	319.33	80.00	259.96	9.558E+07
8.	1.746	80.19	1967.15	282.15	80.00	262.99	1.005E+08
9.	1.746	70.76	1998.90	314.03	80.00	264.60	1.085E+08
10.	1.746	81.77	1960.84	275.84	80.00	262.39	9.827E+07

* * END OF FILE * * *

8838RP 11-20-** 16:46



8838RP 11-20-** 16:46



W.O. 8838
Sec. R-R' Backcut

XSTABL File: 8838RB 11-20-** 16:49

```
*****************************************
*              X S T A B L              *
*                                       *
*       Slope Stability Analysis        *
*             using the                 *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*       Moscow, ID 83843, U.S.A.        *
*                                       *
*         All Rights Reserved           *
*                                       *
* Ver. 5.2C1                96 Â 1545   *
*****************************************
```

Problem Description : Sec. R-R' Backcut

SEGMENT BOUNDARY COORDINATES

6 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1685.0	80.0	1685.0	1
2	80.0	1685.0	80.1	1680.0	1
3	80.1	1680.0	120.0	1680.0	1
4	120.0	1680.0	259.9	1756.0	1
5	259.9	1756.0	260.0	1761.0	1
6	260.0	1761.0	350.0	1738.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

1 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

5000 trial surfaces will be generated and analyzed.

100 Surfaces initiate from each of 50 points equally spaced along the ground surface between x = 120.0 ft
and x = 120.0 ft

Each surface terminates between x = 230.0 ft
and x = 330.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

7.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 26 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	120.00	1680.00
2	126.95	1680.83
3	133.87	1681.86
4	140.76	1683.10
5	147.61	1684.54
6	154.42	1686.19
7	161.17	1688.04
8	167.86	1690.09
9	174.49	1692.35
10	181.05	1694.79
11	187.53	1697.44
12	193.93	1700.27
13	200.24	1703.30
14	206.46	1706.51
15	212.58	1709.91
16	218.59	1713.49
17	224.50	1717.25

W.O. 8838
Sec. R-R' Backcut

18	230.29	1721.18
19	235.96	1725.28
20	241.51	1729.55
21	246.92	1733.99
22	252.20	1738.58
23	257.35	1743.33
24	262.34	1748.24
25	265.55	1751.58
26	265.55	1759.58

**** Simplified BISHOP FOS = 1.993 ****

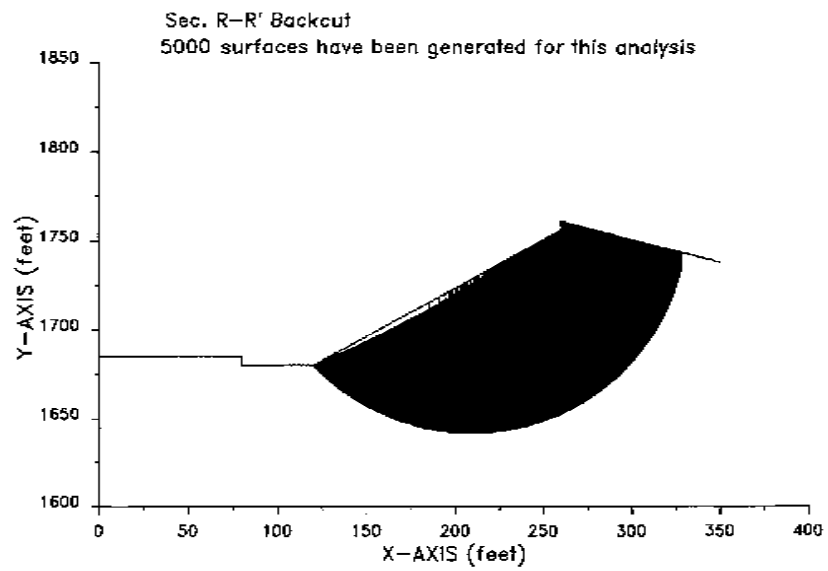
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. R-R' Backcut

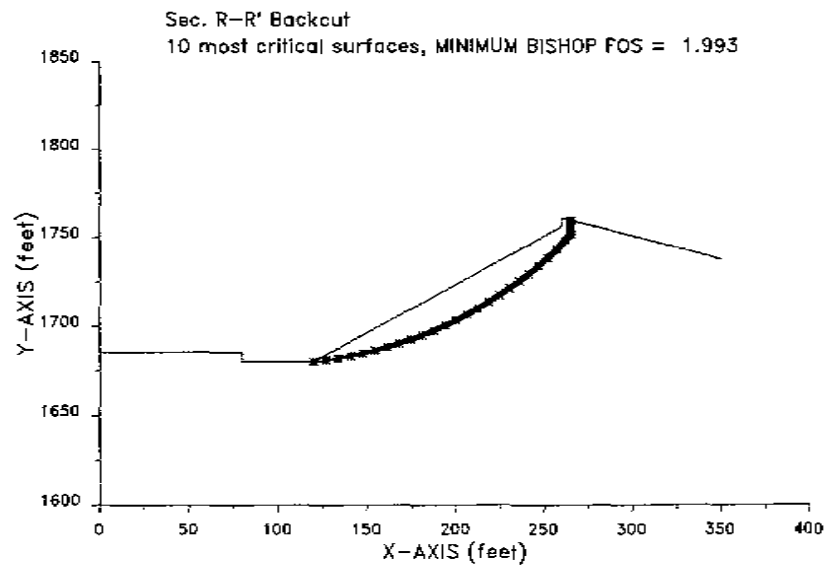
	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.993	95.86	1912.93	234.17	120.00	265.55	5.842E+07
2.	1.994	93.48	1914.32	235.81	120.00	264.36	5.604E+07
3.	1.995	95.52	1918.91	240.17	120.00	267.32	6.263E+07
4.	1.995	86.15	1931.54	253.81	120.00	265.20	5.902E+07
5.	1.996	103.44	1899.27	219.89	120.00	266.20	5.877E+07
6.	1.996	88.30	1924.66	246.71	120.00	264.39	5.675E+07
7.	1.996	87.47	1926.82	248.95	120.00	264.52	5.721E+07
8.	1.996	90.52	1919.11	240.92	120.00	263.99	5.555E+07
9.	1.997	84.85	1939.31	261.68	120.00	266.79	6.320E+07
10.	1.997	97.21	1903.24	224.40	120.00	263.14	5.284E+07

* * * END OF FILE * * *

8838RB 11-20-** 16:49



8838RB 11-20-** 16:49



W.O. 8838

Sec. R-R' Natural slope 40' setback

XSTABL File: 8838RN 11-21-** 10:10

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Á 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Á 1545  *
*****************************************
```

Problem Description : Sec. R-R' Natural slope 40' Setback

SEGMENT BOUNDARY COORDINATES
---

6 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1510.0	120.0	1515.0	1
2	120.0	1515.0	200.0	1540.0	1
3	200.0	1540.0	270.0	1585.0	2
4	270.0	1585.0	280.0	1612.0	2
5	280.0	1612.0	370.0	1666.0	2
6	370.0	1666.0	600.0	1666.0	2

1 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	200.0	1540.0	600.0	1575.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

---
ISOTROPIC Soil Parameters
---

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	200.0	40.00	.000	.0	0
2	125.0	135.0	225.0	40.00	.000	.0	0

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between x = 120.0 ft
and x = 270.0 ft

Each surface terminates between x = 410.0 ft
and x = 520.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

16.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 19 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	186.67	1535.83
2	202.32	1539.15
3	217.83	1543.08
4	233.17	1547.63
5	248.32	1552.77
6	263.25	1558.51
7	277.95	1564.84
8	292.38	1571.74

W.O. 8838

Sec. R-R' Natural slope 40' setback

9	306.53	1579.21
10	320.38	1587.23
11	333.89	1595.79
12	347.06	1604.88
13	359.86	1614.49
14	372.27	1624.59
15	384.27	1635.17
16	395.84	1646.22
17	406.96	1657.72
18	407.21	1658.00
19	407.21	1666.00

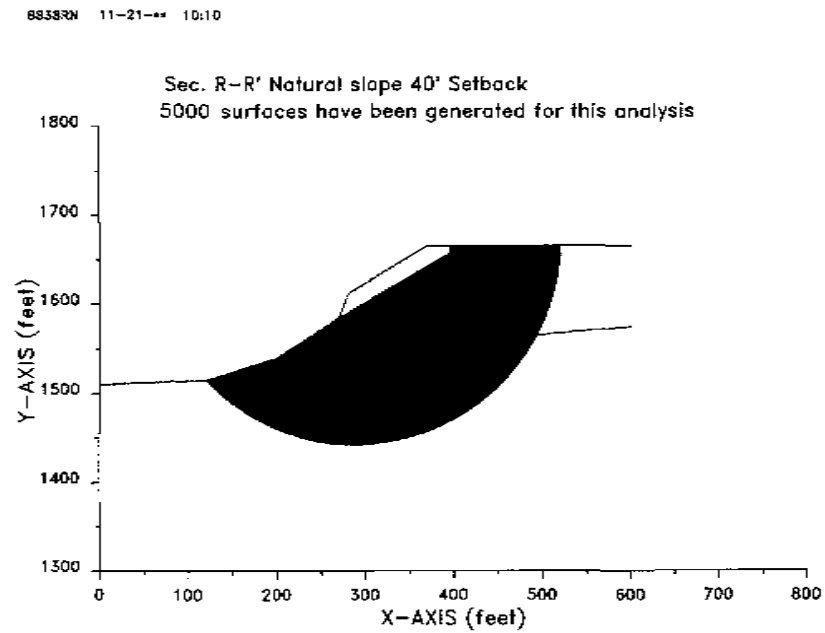
**** Simplified BISHOP FOS = 1.551 ****

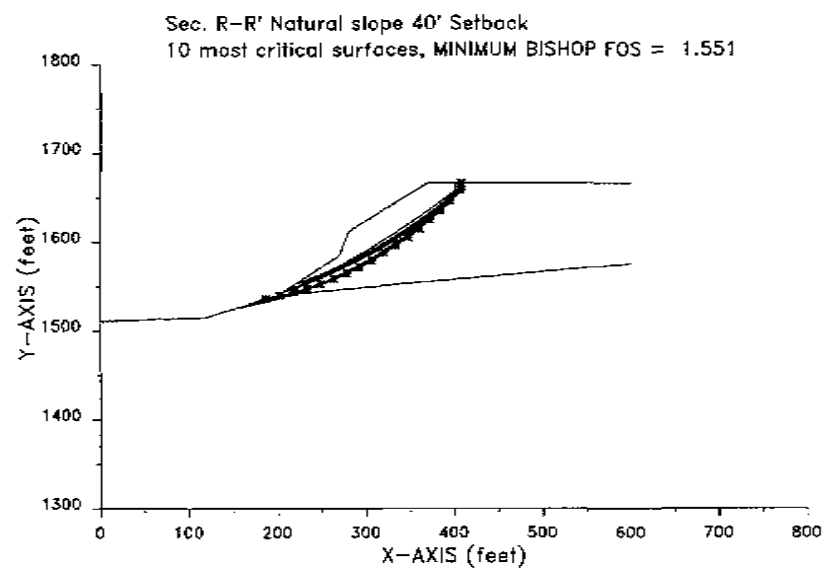
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. R-R' Natural slope 40' Setback

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.551	110.60	1933.33	404.71	186.67	407.21	2.655E+08
2.	1.553	-136.47	2349.15	875.63	203.33	401.10	3.793E+08
3.	1.556	14.27	2109.07	597.62	203.33	406.23	3.147E+08
4.	1.556	-.34	2133.35	625.31	203.33	405.87	3.226E+08
5.	1.558	106.14	1944.30	416.33	186.67	408.36	2.741E+08
6.	1.561	63.30	2004.59	487.56	153.33	406.16	3.100E+08
7.	1.564	80.87	1973.20	453.61	153.33	407.00	3.070E+08
8.	1.571	-63.03	2245.14	751.77	203.33	406.40	3.710E+08
9.	1.571	39.51	2081.66	558.75	220.00	403.75	2.594E+08
10.	1.576	107.08	1967.98	430.21	220.00	405.29	2.234E+08

* * * END OF FILE * * *





W.O. 8838

Sec. R-R', Nat. Slope, 40' Setback, Pseudo

```
XSTABL File: 8838RNP   11-21-**   10:10

*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*         Copyright (C) 1992 À 96       *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Á 1545  *
*****************************************
```

Problem Description : Sec. R-R' Natural slp 40' Sethk, pse

SEGMENT BOUNDARY COORDINATES

6 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1510.0	120.0	1515.0	1
2	120.0	1515.0	200.0	1540.0	1
3	200.0	1540.0	270.0	1585.0	2
4	270.0	1585.0	280.0	1612.0	2
5	280.0	1612.0	370.0	1666.0	2
6	370.0	1666.0	600.0	1666.0	2

1 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	200.0	1540.0	600.0	1575.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	200.0	40.00	.000	.0	0
2	125.0	135.0	225.0	40.00	.000	.0	0

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between x = 120.0 ft
and x = 270.0 ft

Each surface terminates between x = 410.0 ft
and x = 520.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

16.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 17 coordinate points

Point No.	x-surf (ft)	y-surf (ft)

W.O. 8838

Sec. R-R', Nat. Slope, 40' Setback, Pseudo

1	203.33	1542.14
2	218.02	1548.49
3	232.59	1555.10
4	247.04	1561.97
5	261.36	1569.11
6	275.55	1576.51
7	289.59	1584.17
8	303.50	1592.08
9	317.26	1600.25
10	330.87	1608.66
11	344.32	1617.32
12	357.61	1626.23
13	370.74	1635.38
14	383.70	1644.76
15	396.48	1654.39
16	401.10	1658.00
17	401.10	1666.00

**** Simplified BISHOP FOS = 1.155 ****

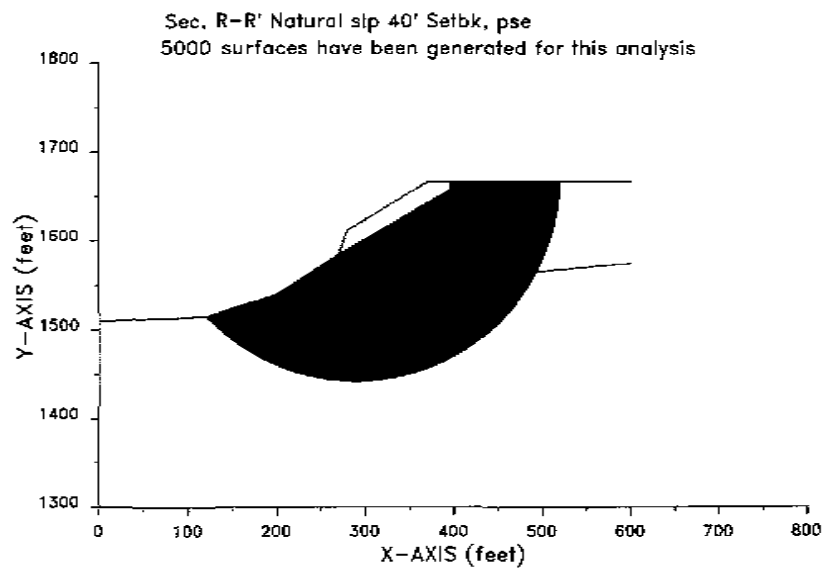
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. R-R' Natural slp 40' Setbk, pse

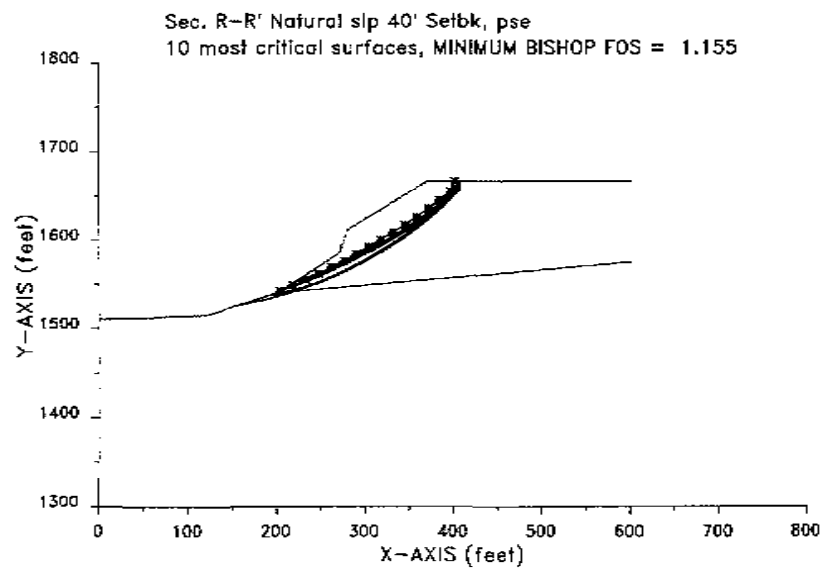
	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.155	-136.47	2349.15	875.63	203.33	401.10	3.493E+08
2.	1.158	-.34	2133.35	625.31	203.33	405.87	2.975E+08
3.	1.158	14.27	2109.07	597.62	203.33	406.23	2.902E+08
4.	1.164	110.60	1933.33	404.71	186.67	407.21	2.454E+08
5.	1.166	-63.03	2245.14	751.77	203.33	406.40	3.422E+08
6.	1.167	106.14	1944.30	416.33	186.67	408.36	2.535E+08
7.	1.169	63.30	2004.59	487.56	153.33	406.16	2.865E+08
8.	1.169	39.51	2081.66	558.75	220.00	403.75	2.394E+08
9.	1.172	80.87	1973.20	453.61	153.33	407.00	2.839E+08
10.	1.176	107.08	1967.98	430.21	220.00	405.29	2.065E+08

* * * END OF FILE * * *

8838RNP 11-21-** 10:10



8838RNP 11-21-** 10:10



REFERENCES

AEG, November 3, 1990; Geology and Engineering Geology of the Western Soledad Basin, Los Angeles County, California, Field Trip Guidebook

CDMG, 1998; Seismic Hazard Evaluation Report of the Mint Canyon 7.5-Minute Quadrangle, Los Angeles County, California, OFR-98-09

..., 1998; Official Map of Seismic Hazards Zones, Mint Canyon 7.5 Min. Quadrangle, Los Angeles County, California

Dibblee, T.W. Jr., 1996; Geologic Map of the Mint Canyon Quadrangle, Los Angeles County, California, Scale 1:24,000

Geolabs-Westlake Village, October 17, 1995; Geotechnical Overview, Property Northwest of Sierra Highway and Soledad Canyon Road, County of Los Angeles

..., June 19, 2001; Second Party Review of Geotechnical Conditions and Reports, Tract 46626, North of Canyon Crest Drive, City of Santa Clarita, California

..., March 6, 2004; Geotechnical Investigation of Vesting Tentative Tract Map No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

..., August 23, 2004; Response to LACDPW Review Sheets Dated May 25 and June 15 ,2004 for Tentative Tract Map No. 60922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

..., January 3, 2005; Response to LACDPW Review Sheets dated October 12 and 15, Tentative Tract No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

GeoSoils, Inc., August 31, 2006; Progress Report No. 2, May 2006, Rough Grading of Tracts 46018-08 through 46018-11, Plum Canyon , County of Los Angeles, California

..., June 23, 2006; Progress Report No. 1, April 2006, Rough Grading of Tracts 46018-08 through 46018-11, Plum Canyon , County of Los Angeles, California

..., June 5, 2006; Geologic and Geotechnical Engineering Report, Revised Tentative Tract Map 46018, Plum Canyon, County of Los Angeles, California, W.O. 5602A

..., April 17, 2002; Offsite Grading, North Rear of Lot 28, Tract 46626, Canyon Country, City of Santa Clarita, California

.., June 30, 1999; Final Compaction Report, Lots 1 through 138, Tract 46626, Santa Clarita, California

..., February 9, 1999; Progress Report, Tract 46626, Lots 1 through 138, City of Santa Clarita, California

..., October 31, 1996; Memo-Field Exploration of Landslide and Water Tank Site, Vesting Tentative Tract 46626, Canyon Country, City of Santa Clarita, California

..., February 5, 1999; Construction Memo-False Cut/Back Cut Failure, Tract 46626, Canyon Country, City of Santa Clarita, California

..., March 18, 1997; Summary of Removals and Buttress Sizing, 138 Lot Portion of Vesting Tentative Tract 46626, Canyon Country, City of Santa Clarita, California

Geotechnical Associates, February 4, 1997; Final Rough Grading Compaction Test Report, Plum Canyon/Whites Canyon Road Alignment, 7.5.464., Tentative Tract No. 46018, Saugus Area of Los Angeles County, CA

LACDPW, May 5 and June 15, 2004; Geologic and Soils Engineering Review Sheets for Tent. Tr. Map 060922, Santa Clarita Area, County of Los Angeles, California

..., October 12 and 15, 2004; Geologic and Soils Engineering Review Sheets for Tent. Tr. Map 060922, Santa Clarita Area, County of Los Angeles, California

..., February 7 and 22, 2005; Geologic and Soils Engineering Review Sheets (Approval) for Tentative Tract Map 060922, Santa Clarita Area, County of Los Angeles, California

..., July 24 and August 2, 2006; Geologic and Soils Engineering Review Sheets fort Revised Tentative Tract Map 46018, Plum Canyon

Larson, R.A., and Buckley, C.I., 1990; Geology and Engineering Geology of the Western Soledad Basin, Los Angeles County, California, Southern California Section of the Association of Engineering Geologists, 1990 Annual Field Trip Guidebook.

Leighton and Associates, October 11, 1999; Supplemental Geotechnical Investigation and Geotechnical Review of the 100-Scale Bulk Grading Plan, Tr. 46018, Plum Canyon, Saugus, California

..., April 19, 2004; Geotechnical Review of the 40-Scale Rough Grading Plan, Tracts 46018-10 and 46018-11, and Associated Fill Disposal Site, Plum Canyon Area, Saugus, County of Los Angeles, California

Munger Map Book, 1994; California-Alaska Oil and Gas Fields

Pacific Soils Engineering, Inc., May 6, 1992; Response to LACDPW Geologic and Geotechnical Engineering Review Sheets of the Supplemental Geologic/Geotechnical Investigation and Preliminary Grading Plan Review, Tracts 44967, 49433, and 49434 of Tentative Tract 44967, Mystery Mesa Project, County of Los Angeles, California

..., October 18, 1993; Grading Plan Review, Tract 49433 (Unit of Tentative Tract No. 44967), Including Summary of Geologic/Geotechnical Investigations, Mystery Mesa Project, County of Los Angeles, California

Saul, R.B., and Wooton, T.M., 1983, Geology of the south half of the Mint Canyon Quadrangle, Los Angeles County, California, CDMG Open File Report 83-24LA, Map Scale 1:9,600

Yerkes, R.F.(compiler), 1996; Preliminary Geologic Map of the Mint Canyon 7.5 Minute Quadrangle, Southern California, U.S. Geological Survey Open File Report 96-89, Scale 1:24,000

AERIAL PHOTOGRAPHS

Flight C-300, 1928, Frames F9, F10, F11, E243, E244, E245, Scale 1:18,000

Flight C-17727, 1952, Frames 4-72, 4-73, 4-74, Scale 1:14,400

Flight TG-7600, 1976, Frames 21-3, 21-4, 21-5, Scale 1:24,000

Flight 94-028, acc. 04684, 1994, Frames 106, 107, 108, 1:32,500

Horizon Surveys, performed for Sikand Engineering, Tr. 50846, Monarch Hills project, dated January 29, 1994, Frames 1-5, Scale 1:4800 +/-

GEOLABS-WESTLAKE VILLAGE
Foundation and Soils Engineering, Geology
31119 Via Colinas, Suite 502 • Westlake Village, CA 91362
Voice: (818) 889-2562 (805) 495-2197
Fax: (818) 889-2995 (805) 379-2603
a dba of
R & R Services
Corporation

April 13, 2007
W.O. 8838

Pardee Homes
26650 The Old Road, Suite 110
Valencia, California 91381

Attention: Mr. Tom Mitchell

SUBJECT: Response to Soils Engineering Review Sheet dated February 8, 2007, Tentative Tract Map No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

Mr. Mitchell:

We present herein our responses to the issued raised by the Los Angeles County Department of Public Works Soils Engineering Review Sheet dated February 8, 2007. A copy of the letter, along with the Geologic Review Sheet which did not contain any comments, is provided in Appendix A.

Item #1 – Slope Stability Analyses for Cross Sections B6-B6' and N-N'

The Geologic Map presented in our November 16, 2006 report utilized the 1"=200' scale Tentative Tract Map provided to our office by Sikand Engineers. This map is attached as Plate 1.2. At the 1"=200' scale, the eight feet wide terrace benches in the cross section (and map) are difficult to distinguish, let alone to illustrate. Cross Section B6-B6 and N-N' depict one of the largest slopes proposed, that contains up to six 8-foot benches, and two 20-foot wide benches. Our previously submitted analyses and cross sections included one 20-foot wide bench, and "smoothed" the terrain between the 20-foot bench and the top and toe of slope. This smoothing of the terrain (elimination of the smaller benches) allowed for a cleaner depiction of the slope, and yielded the 2.5:1 overall slope gradient as noted by the reviewer. In our experience of

evaluating slopes of such height (particularly for feasibility purposes), there is typically little change in the factor of safety by the "smoothing" of such slopes, since the overall gradient of the slope (from top to toe of slope) remains nearly the same.

Cross Sections B6-B6' and N-N' have been revised to reflect all of the benches and re-analyzed to verify the consistency in the factor of safety (versus the smoothing). It should be noted that the overall slope gradient of these slopes remains about 2.5:1 due to the numerous benches and intervening 2:1 slope gradient.

The revised analyses for Cross Sections B6-B6' and N-N' are presented in Appendix B. Shear strengths and the method of analysis remain as outlined in our referenced reports for Tentative Tract Map No. 060922. We have also revisited the other cross sections exhibiting tall graded slopes which were simplified and drawn with overall gradients slightly flatter than 2:1. Those slopes with factors of safety near the required minimum of 1.5 were reanalyzed. The output for such analyses is also provided in Appendix B. The following table summarizes the factors of safety for these analyses, and those previously presented in our November 16, 2006 report for comparison purposes.

Analysis	F.O.S. Revised Analyses with all 8' benches depicted	F.O.S. from November 16, 2006 Report
B6-B6' static	1.66	1.60
B6-B6' pseudostatic	1.20	1.20
N-N' static	2.15	2.26
N-N' pseudostatic	1.47	1.54
C3-C3' static	1.70	1.70
C3-C3' pseudostatic	1.24	1.25
B2-B2' static	1.50	1.52
C-C' static	1.59	1.60
C-C' pseudostatic	1.11	1.12
D-D' static	1.58	1.56

As indicated, the slopes have factors of safety above the required minimums. Refinement of the proposed grading led to very minor differences in the factors of safety. Slope stability analyses for these areas shall be revisited at the 1"=40' scale grading plan stage for design and

verification purposes.

Item #2 – Tentative Tract Map Modifications

The reviewer noted that the Tentative Tract Map configuration presented in our previous report does not conform with the map on file with Regional Planning (dated December 27, 2004). As the processing of TTM 060922 continues, we anticipate that Regional Planning will ultimately have the map/layout presented in this report and our November 16, 2006 report. Should further changes be made to the Tentative Tract Map, supplemental geotechnical report(s) shall be submitted by our office to address such changes.

SUMMARY

Based on our review of the available data and Tentative Tract Map design prepared by Sikand Engineers, Tentative Tract Map No. 60922 is considered feasible from a geotechnical engineering and engineering geologic perspective.

111 STATEMENT

Based upon tests conducted as outlined in this and applicable referenced reports, and if constructed in accordance with our recommendations and properly maintained, it is the opinion of the undersigned, a duly registered professional engineer and engineering geologist, that (1) the proposed grading and proposed structure(s) will be safe against hazard from landslide, settlement or slippage, and that (2) the proposed building or grading construction will have no adverse effect on the geologic stability of property outside the building site. The nature and extent of tests conducted for purposes of this declaration are, in the opinion of the undersigned, in conformance with generally accepted practices in this area. Test findings and statements of professional opinion do not constitute a guarantee or warranty, express or implied.

CLOSURE

This geotechnical report has been prepared in accordance with generally accepted

engineering practices at this time and location. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

Thank you for this opportunity to be of service. Please do not hesitate to call if you have any questions regarding this report.

Respectfully submitted,
GEOLABS-WESTLAKE VILLAGE

David Sarkisian
C.E.G. 2183

Ronald Z. Shmerling
C.E.G. 1047
R.C.E. 35444

Enclosures:

Geologic Map	Plate 1.2 (in pocket)
Cross Sections	Plate 2.1-2.4
LACDPW Review Sheets	Appendix A
Slope Stability Analyses	Appendix B
References	Plates R.1-R.3

XC: (1) Addressee
(1) Pardee-Valencia, Attention Jim Bizzelle
(2) Sikand Engineers, Attention Craig Young
(2) County of Los Angeles, Land Development (and 1 PDF on CD)
(2) PCR Services, Attention Jay Ziff (and 1 PDF on CD)
233 Wilshire Blvd., Suite 130
Santa Monica, CA 90401
(1) File

Copies of Maps on file with the
County of Los Angeles,
Department of Public Works,
Land Development

Proposed lot cap

Geologic Contact (dashed where approx., dotted where covered)

Fault (dashed where approx., dotted where covered)

Estimated removal depth

Line of Cross Section

Buttress keyway

P:\8838 Pardee-Skyline Ranch\8838geo200scale.dwg (Layout: GE

ALE 1"=200'

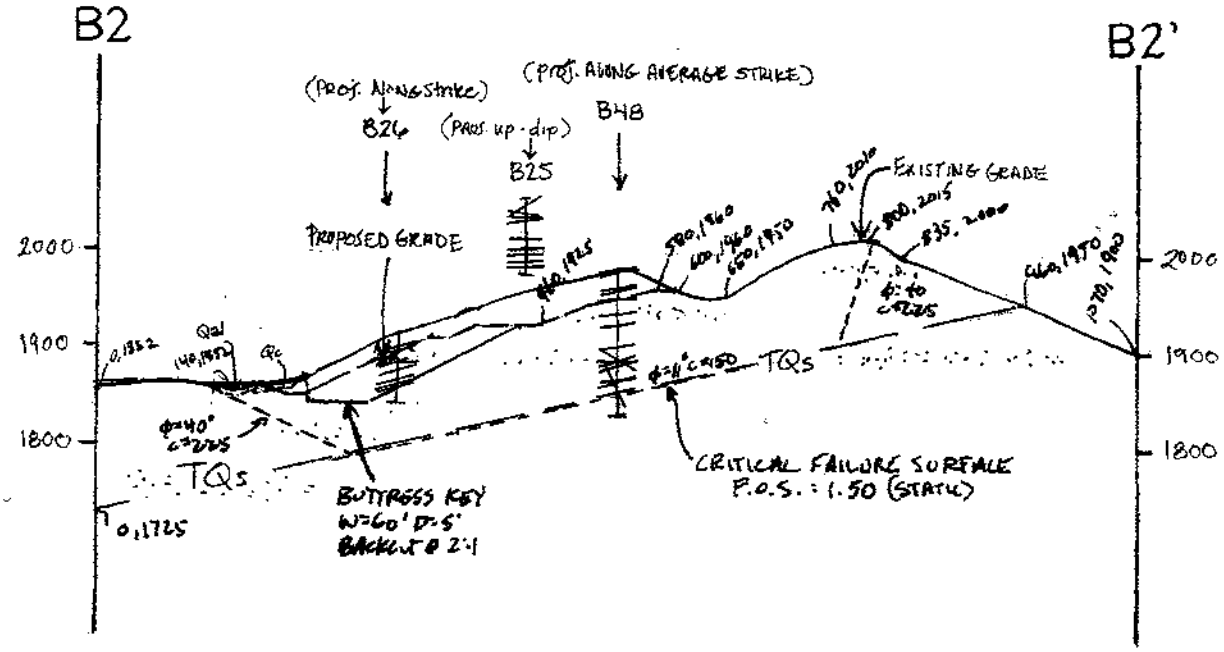
400 800
FEET

REISSUED 4/13/07

Geolabs - Westlake Village
GEOLOGY AND SOIL ENGINEERING

DATE 11/16/06 BY KMM/TC
SCALE 1"=200' W.O. 8838

PLATE 1.2



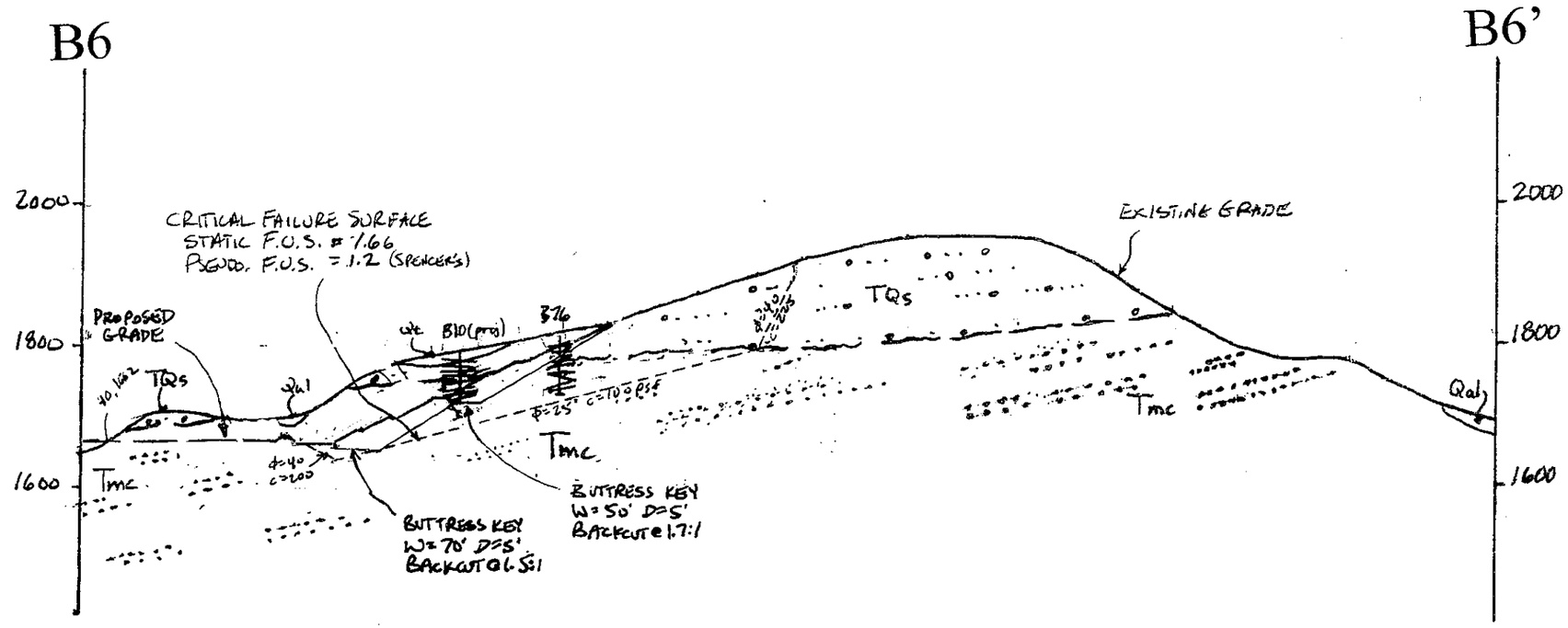
Geolabs – Westlake Village

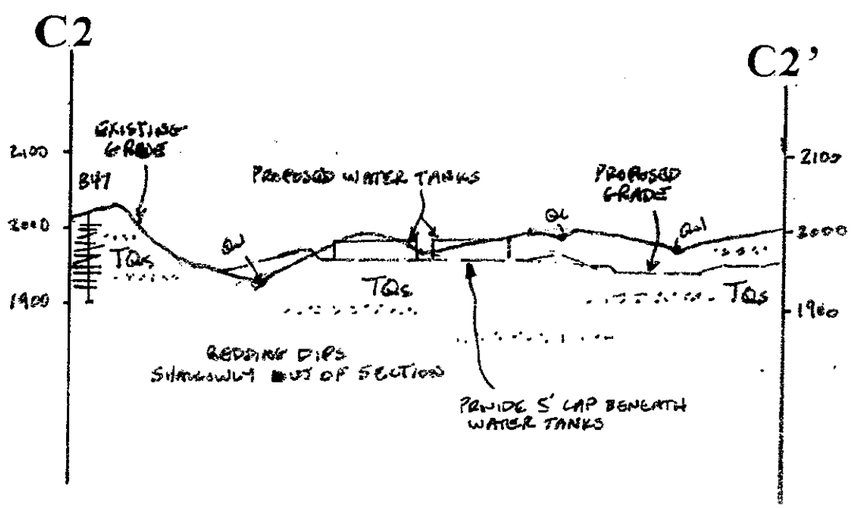
GEOLOGY AND SOIL ENGINEERING

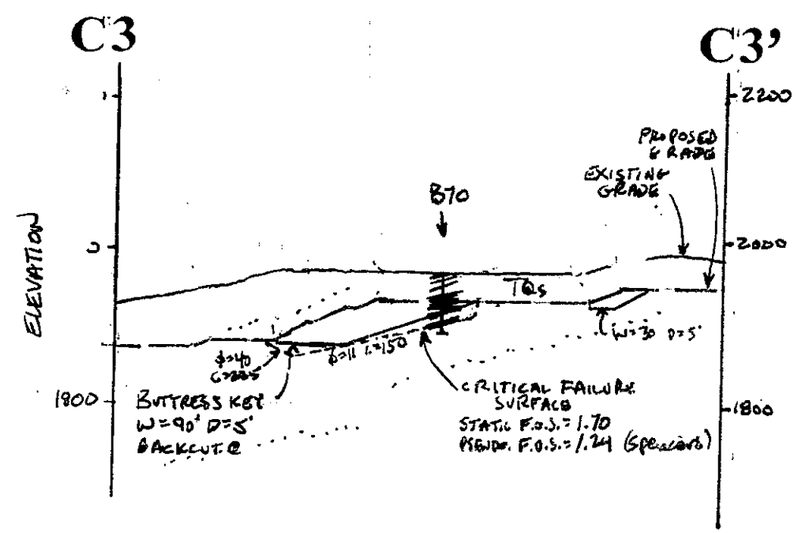
DATE 4/13/07 BY

SCALE 1" = 200' W.O. 8938

PLATE 2.1





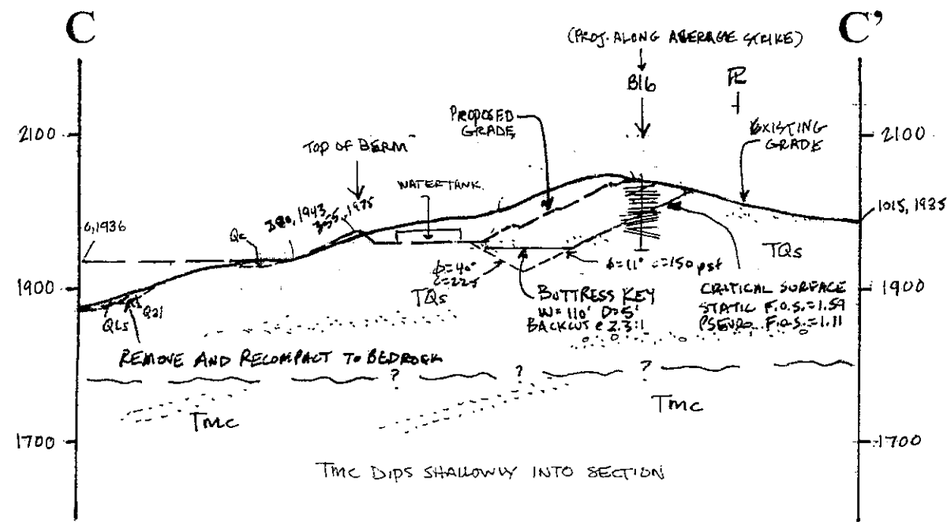


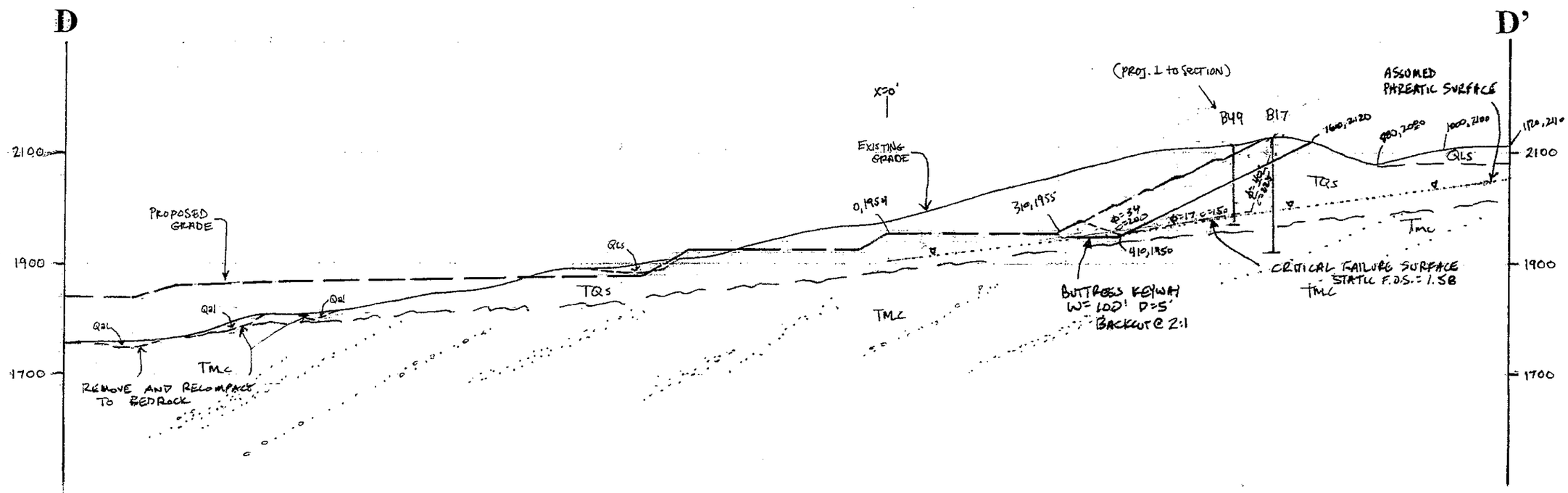
REVISED 4/13/07

Geolabs – Westlake Village
GEOLOGY AND SOIL ENGINEERING

DATE 11/16/06 BY DS
SCALE 1"=20' W.O. 8838

PLATE 2.2





REV. 4/13/07

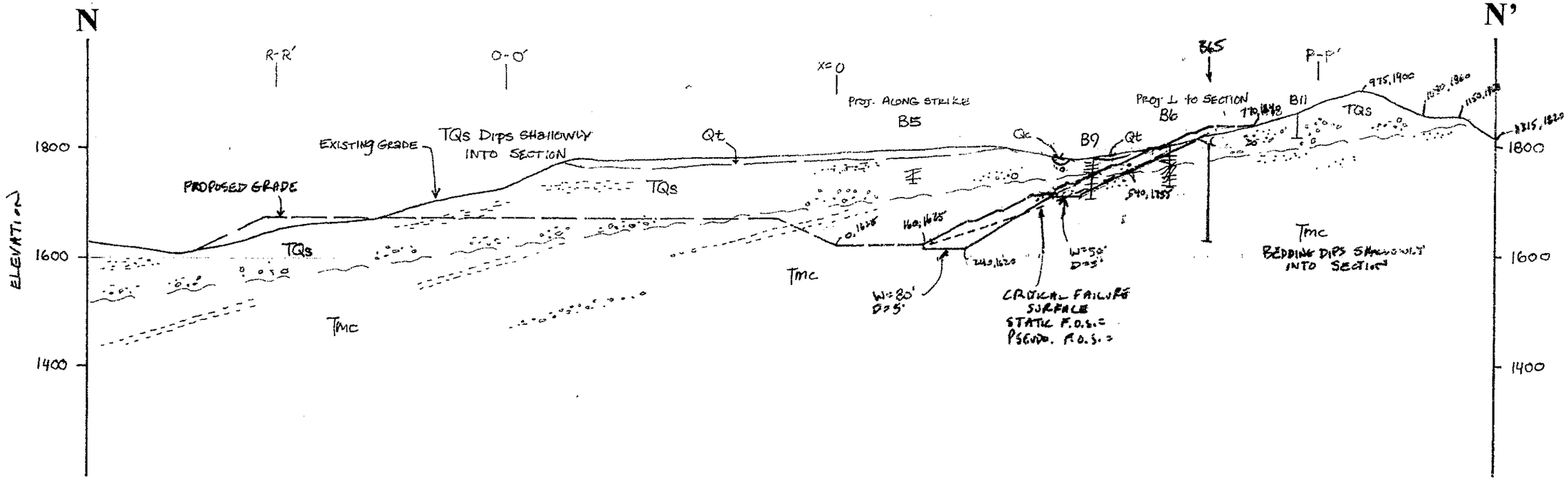
Geolabs - Westlake Village

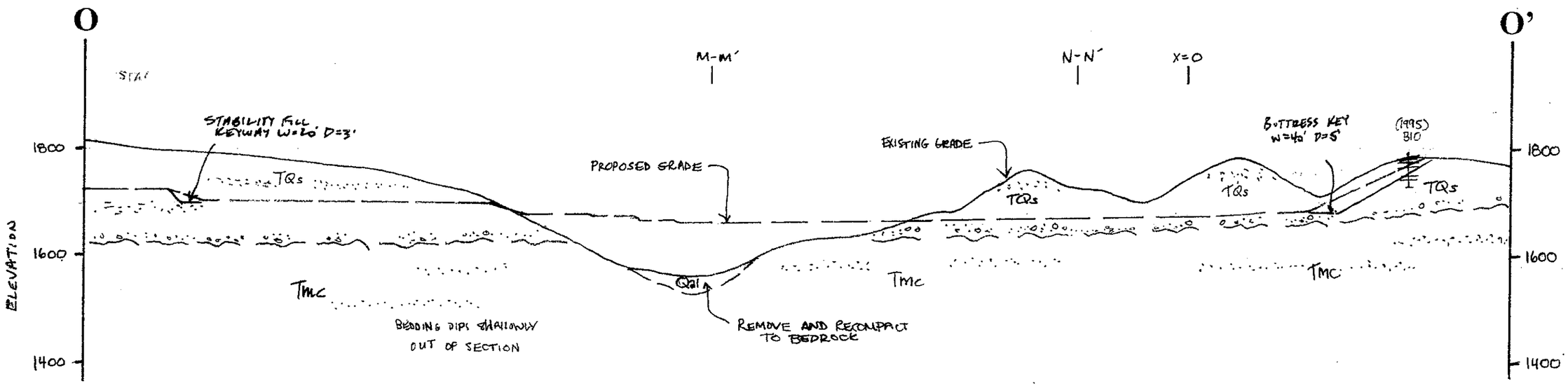
GEOLOGY AND SOIL ENGINEERING

DATE 11/16/06 BY DS

SCALE 1"=200' W.O. 8838

PLATE 2.3





REV. 4/13/07

Geolabs - Westlake Village
GEOLOGY AND SOIL ENGINEERING

DATE 11/16/06 BY JN
SCALE 1" = 200' W.O. 8838

PLATE 2.4

APPENDIX A

LACDPW REVIEW SHEETS FOR TTM 060922, SKYLINE RANCH, COUNTY OF LOS ANGELES, CALIFORNIA

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

RECEIVED FEB 14 2007

DISTRIBUTION
1 Geologist
__ Soils Engineer
1 GMED File
1 Subdivision

TENTATIVE TRACT MAP 60922
SUBDIVIDER Pardee Homes
ENGINEER Sikand
GEOLOGIST & SOILS ENGINEER Geolabs – Westlake Village

TENTATIVE MAP DATED 12/18/06 (Revised)
LOCATION Santa Clarita

REPORT DATE 11/16/06 (CD), 1/3/05, 8/23/04, 3/6/04

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 2/8/07 is attached.

NOTE Provide a copy of this review with your resubmittal

Prepared by Geir R. Mathisen Reviewed by _____ Date 2/6/07

P:\gmepub\Geology_Review\Geir\Review Sheets\District 8.2 (Santa Clarita)\Tracts\60922, TM7 NA.doc

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 8.2
Job Number LX001129
Sheet 1 of 2

DISTRIBUTION:
___ Drainage
___ Grading
___ Geo/Soils Central File
___ District Engineer
___ Geologist
___ Soils Engineer
___ Engineer/Architect

Tentative Tract Map	60922
Location	Santa Clarita
Developer/Owner	Pardee Homes
Engineer/Architect	Sikand
Soils Engineer	Geolabs - Westlake Village
Geologist	Same as above

Review of:

Revised Tentative Tract Map Dated By Regional Planning **12/18/06**
Soil Engineering and Geologic Report Dated 11/16/06, 1/3/05, 8/23/04, 3/06/04
Previous review sheet dated 1/10/07

ACTION:

Tentative Map feasibility is not recommended for approval.

REMARKS:

As Previously Requested:

1. In the slope stability analyses within the submitted report, the profile of the proposed slopes in the analyses for Cross Sections B6-B6' and Cross Section N-N' is at 2.5:1 gradient. However on the submitted geotechnical maps and on the tentative map the slopes are proposed to be at 2:1 gradient. Verify the gradient of the proposed slopes for all slope stability analyses and provide revised slope stability analyses as necessary. Recommend mitigation if factors of safety are below County minimum standards.

2. The geotechnical maps within the submitted report do not conform to the latest tentative map dated by Regional Planning 12/27/04. Provide geotechnical maps and tentative maps that conform, as requested by the Geology Section.

3. Include a copy of this review sheet with your response.

NOTE(S) TO THE PLAN CHECKER/BUILDING AND SAFETY ENGINEER:
A. THE ON-SITE SOILS ARE SEVERELY CORROSIVE TO FERROUS METALS.
B. THE ON-SITE SOILS HAVE A MEDIUM EXPANSION POTENTIAL.
C. OFF-SITE GRADING IS RECOMMENED FOR THE REMOVAL AND RECOMPACTION OF LANDSLIDES QLS-9A, QLS-10, QLS-10A, L1, AND L17.

REGISTERED PROFESSIONAL ENGINEER
YOSHIYA MORISAKU
No. 67587
Exp. 6/30/07
STATE OF CALIFORNIA

Reviewed by Yoshiya Morisaku Date 2/8/07

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\60922TentTe

APPENDIX B

SLOPE STABILITY ANALYSES
TTM 060922, SKYLINE RANCH,
COUNTY OF LOS ANGELES, CALIFORNIA

8838

Sec. B2-B2' W=60' D=5'

XSTABL File: 8838B2 4-13-** 13:40

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*         Copyright (C) 1992 À 96       *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 À 1545  *
*****************************************
```

Problem Description : Sec. B2-B2' W=60' D=5'

SEGMENT BOUNDARY COORDINATES

20 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1852.0	140.0	1852.0	1
2	140.0	1852.0	148.0	1856.0	1
3	148.0	1856.0	153.0	1856.0	1
4	153.0	1856.0	165.0	1850.0	1
5	165.0	1850.0	230.0	1850.0	1
6	230.0	1850.0	286.0	1875.0	2
7	286.0	1875.0	294.0	1875.0	2
8	294.0	1875.0	342.0	1900.0	2
9	342.0	1900.0	350.0	1900.0	2
10	350.0	1900.0	396.0	1925.0	2
11	396.0	1925.0	440.0	1925.0	2
12	440.0	1925.0	460.0	1925.0	1
13	460.0	1925.0	580.0	1960.0	1
14	580.0	1960.0	600.0	1960.0	1
15	600.0	1960.0	650.0	1950.0	1
16	650.0	1950.0	760.0	2010.0	1
17	760.0	2010.0	800.0	2015.0	1
18	800.0	2015.0	835.0	2000.0	1
19	835.0	2000.0	960.0	1950.0	1
20	960.0	1950.0	1070.0	1900.0	2

4 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	230.0	1850.0	230.1	1845.0	1
2	230.1	1845.0	290.0	1845.0	1
3	290.0	1845.0	440.0	1925.0	1
4	.0	1725.0	960.0	1950.0	3

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	1
2	125.0	135.0	200.0	34.00	.000	.0	1
3	130.0	140.0	225.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	6.00	225.0	40.00
2	12.00	150.0	17.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	6.00	225.0	40.00
2	12.00	150.0	11.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 4 coordinate points

```
*********************************
        PHREATIC SURFACE,
*********************************
```

8838

Sec. B2-B2' W=60' D=5'

Point No.	x-water (ft)	y-water (ft)
1	.00	1850.00
2	230.00	1850.00
3	242.00	1856.00
4	1000.00	1856.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	215.0	1795.0	360.0	1835.0	100.0
2	380.0	1840.0	880.0	1930.0	100.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	114.09	1852.00
2	166.55	1827.54
3	257.18	1785.28
4	262.49	1782.80
5	783.45	1886.96
6	794.78	1911.28
7	832.85	1992.92
8	832.85	2000.92

** Corrected JANBU FOS = 1.503 ** (Fo factor = 1.056)

Failure surface No. 2 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	201.41	1850.00
2	221.80	1840.49
3	312.43	1799.23
4	315.21	1796.93
5	792.07	1897.92
6	798.72	1912.20
7	835.79	1991.69
8	835.79	1999.69

** Corrected JANBU FOS = 1.503 ** (Fo factor = 1.055)

Failure surface No. 3 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	197.96	1850.00
2	219.51	1839.95
3	310.14	1797.69
4	315.25	1795.31
5	775.54	1889.98
6	784.33	1908.83
7	825.09	1996.25
8	825.09	2004.25

** Corrected JANBU FOS = 1.520 ** (Fo factor = 1.060)

Failure surface No. 4 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	194.15	1850.00
2	211.87	1841.74
3	302.50	1799.48
4	785.28	1899.05
5	790.51	1910.28
6	829.68	1994.28
7	829.68	2002.28

** Corrected JANBU FOS = 1.534 ** (Fo factor = 1.056)

Failure surface No. 5 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	187.09	1850.00
2	212.27	1838.26
3	302.90	1795.99
4	312.87	1791.35
5	750.68	1878.86
6	762.23	1903.65
7	804.50	1994.28
8	808.69	2003.28
9	808.69	2011.28

** Corrected JANBU FOS = 1.547 ** (Fo factor = 1.067)

Failure surface No. 6 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	202.09	1850.00
2	216.78	1843.15
3	307.41	1800.89

8838
Sec. B2-B2' W=60' D=5'

4	768.89	1889.49
5	777.12	1907.14
6	819.38	1997.77
7	819.74	1998.54
8	819.74	2006.54

** Corrected JANBU FOS = 1.549 ** (Fo factor = 1.062)

Failure surface No. 7 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	191.86	1850.00
2	238.83	1828.10
3	772.21	1939.73
4	802.98	2005.72
5	802.98	2013.72

** Corrected JANBU FOS = 1.551 ** (Fo factor = 1.043)

Failure surface No. 8 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	167.39	1850.00
2	191.32	1838.84
3	281.95	1796.58
4	800.53	1888.46
5	813.18	1915.59
6	846.64	1987.34
7	846.64	1995.34

** Corrected JANBU FOS = 1.558 ** (Fo factor = 1.055)

Failure surface No. 9 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	103.55	1852.00
2	148.90	1830.85
3	239.53	1788.59
4	761.57	1884.43
5	771.66	1903.86
6	813.93	1996.49
7	815.69	2000.28
8	815.69	2008.28

** Corrected JANBU FOS = 1.565 ** (Fo factor = 1.039)

Failure surface No.10 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	133.26	1852.00
2	179.30	1830.53
3	269.94	1788.27
4	282.58	1782.37
5	765.65	1871.50
6	782.90	1908.49
7	824.04	1996.70
8	824.04	2004.70

** Corrected JANBU FOS = 1.565 ** (Fo factor = 1.064)

The following is a summary of the TEN most critical surfaces

Problem Description : Sec. B2-B2' W=60' D=5'

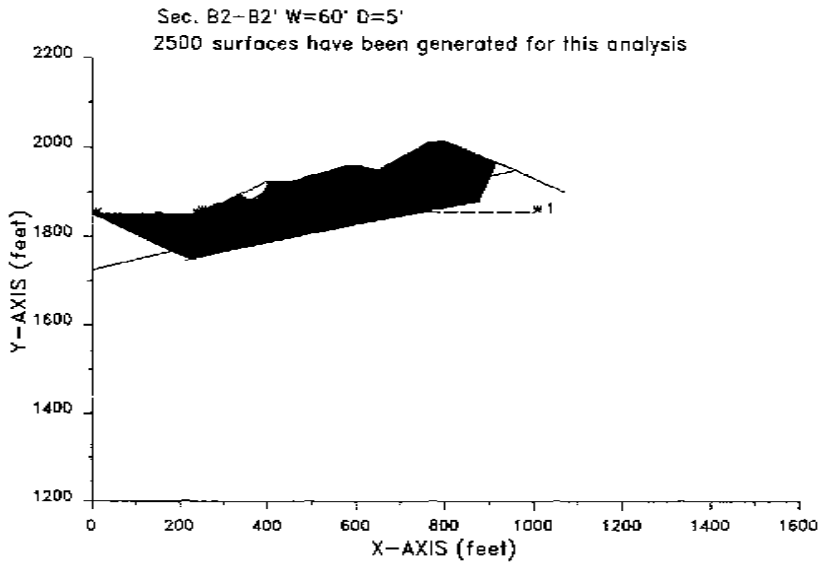
	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.503	1.056	114.09	832.85	2.317E+06
2.	1.503	1.055	201.41	835.79	2.087E+06
3.	1.520	1.060	197.96	825.09	2.153E+06
4.	1.534	1.056	194.15	829.68	2.102E+06
5.	1.547	1.067	187.09	808.69	2.239E+06
6.	1.549	1.062	202.09	819.74	2.111E+06
7.	1.551	1.043	191.86	802.98	1.337E+06
8.	1.558	1.055	167.39	846.64	2.193E+06
9.	1.565	1.059	103.55	815.69	2.282E+06
10.	1.565	1.064	133.26	824.04	2.475E+06

* * * END OF FILE * * *

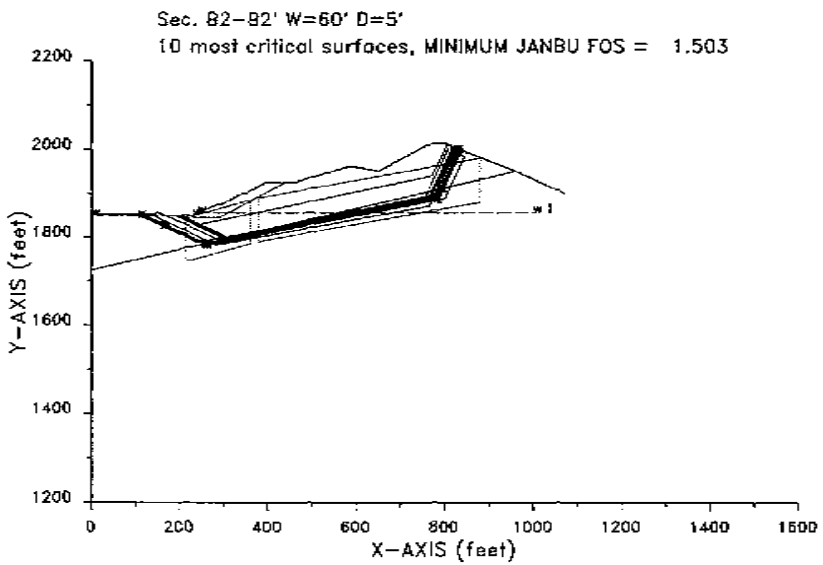
8838

Sec. B2-B2' W=60' D=5'

883882 4-13-** 13:40



883882 4-13-** 13:40



W.O. 8838
Sec. B2-B2' Backcut

XSTABL File: 8838B2B 4-13-** 13:44

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 A 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 A 1545  *
*****************************************
```

Problem Description : Sec. B2-B2' Backcut

SEGMENT BOUNDARY COORDINATES

17 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1852.0	140.0	1852.0	1
2	140.0	1852.0	148.0	1856.0	1
3	148.0	1856.0	153.0	1856.0	1
4	153.0	1856.0	165.0	1850.0	1
5	165.0	1850.0	230.0	1850.0	1
6	230.0	1850.0	230.1	1845.0	1
7	230.1	1845.0	290.0	1845.0	1
8	290.0	1845.0	440.0	1925.0	1
9	440.0	1925.0	460.0	1925.0	1
10	460.0	1925.0	580.0	1960.0	1
11	580.0	1960.0	600.0	1960.0	1
12	600.0	1960.0	650.0	1950.0	1
13	650.0	1950.0	760.0	2010.0	1
14	760.0	2010.0	800.0	2015.0	1
15	800.0	2015.0	835.0	2000.0	1
16	835.0	2000.0	960.0	1950.0	1
17	960.0	1950.0	1070.0	1900.0	2

1 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1725.0	960.0	1950.0	3

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 6.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	6.00	225.0	40.00
2	12.00	150.0	17.00
3	90.00	225.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	6.00	225.0	40.00
2	12.00	150.0	11.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of

W.O. 8838
Sec. B2-B2' Backcut

sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	265.0	1780.0	365.0	1835.0	100.0
2	380.0	1840.0	880.0	1930.0	100.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	319.27	1860.61
2	328.64	1856.24
3	433.25	1878.43
4	451.24	1917.00
5	451.24	1925.00

** Corrected JANBU FOS = 1.401 ** (Fo factor = 1.078)

Failure surface No. 2 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	299.52	1850.08
2	300.62	1849.56
3	466.30	1883.30
4	485.48	1924.43
5	485.48	1932.43

** Corrected JANBU FOS = 1.422 ** (Fo factor = 1.068)

Failure surface No. 3 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	295.80	1848.09
2	307.78	1842.50
3	431.70	1863.12
4	456.83	1917.00
5	456.83	1925.00

** Corrected JANBU FOS = 1.465 ** (Fo factor = 1.082)

Failure surface No. 4 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	264.93	1845.00
2	347.55	1806.47
3	792.62	1891.47
4	802.73	1913.14
5	838.79	1990.48
6	838.79	1998.48

** Corrected JANBU FOS = 1.482 ** (Fo factor = 1.060)

Failure surface No. 5 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	324.38	1853.33
2	332.00	1859.78
3	433.39	1876.81
4	452.13	1917.00
5	452.13	1925.00

** Corrected JANBU FOS = 1.484 ** (Fo factor = 1.081)

Failure surface No. 6 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	264.59	1845.00
2	282.40	1836.69
3	751.13	1929.13
4	786.67	2005.33
5	786.67	2013.33

** Corrected JANBU FOS = 1.486 ** (Fo factor = 1.052)

Failure surface No. 7 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	285.14	1845.00
2	294.50	1840.63
3	774.59	1934.34
4	807.06	2003.97
5	807.06	2011.97

** Corrected JANBU FOS = 1.494 ** (Fo factor = 1.049)

Failure surface No. 8 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	262.42	1845.00
2	345.90	1806.07
3	349.68	1804.31
4	720.85	1880.96
5	727.66	1895.54
6	769.92	1986.18
7	778.37	2004.30
8	778.37	2012.30

** Corrected JANBU FOS = 1.499 ** (Fo factor = 1.071)

Failure surface No. 9 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)

W.O. 8838
Sec. B2-B2' Backcut

1	281.68	1845.00
2	294.53	1839.01
3	758.06	1926.39
4	795.38	2006.42
5	795.38	2014.42

** Corrected JANBU FOS = 1.504 ** (Fo factor = 1.054)

Failure surface No.10 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	317.42	1859.63
2	325.80	1855.72
3	791.26	1951.69
4	814.21	2000.91
5	814.21	2008.91

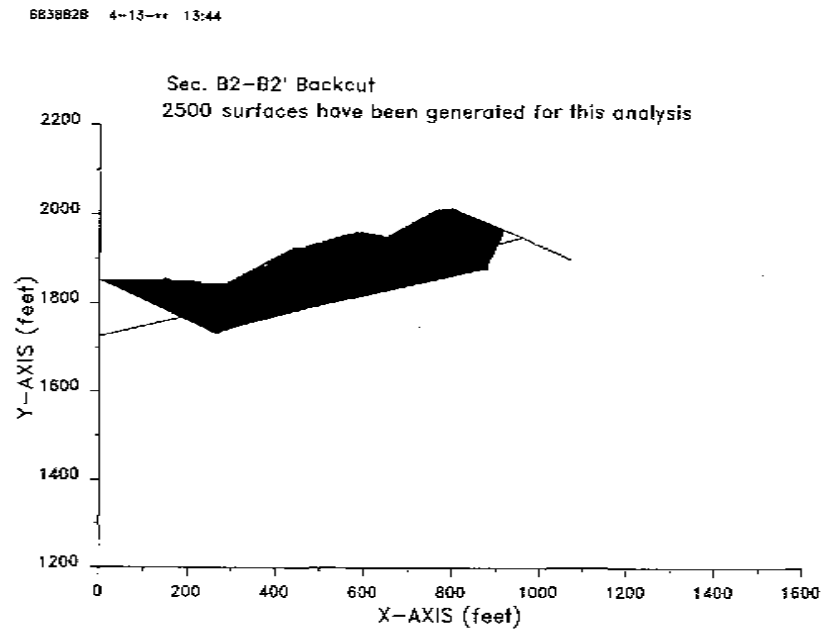
** Corrected JANBU FOS = 1.510 ** (Fo factor = 1.040)

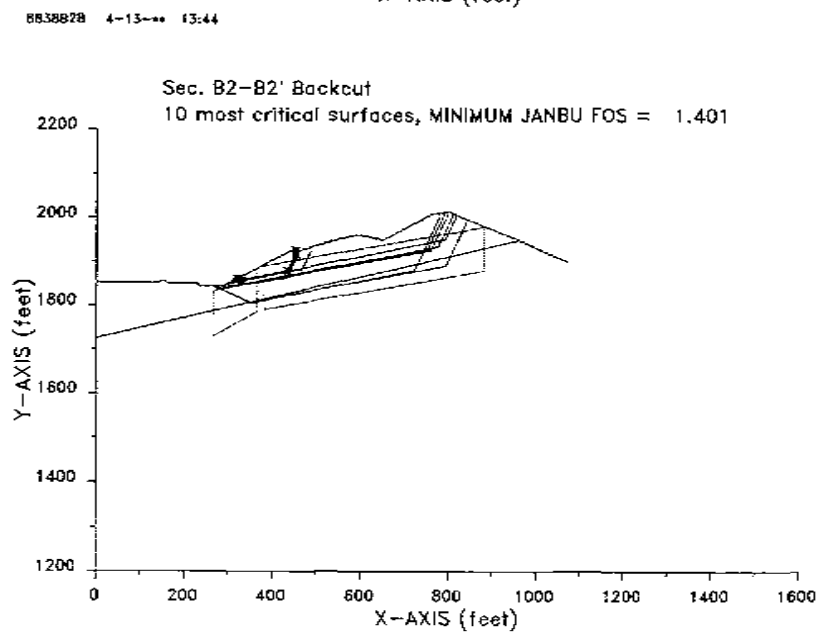
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. B2-B2' Backcut

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.401	1.078	319.27	451.24	1.880E+05
2.	1.422	1.068	299.52	485.48	2.588E+05
3.	1.465	1.082	295.80	456.83	3.026E+05
4.	1.482	1.060	264.93	838.79	1.990E+06
5.	1.484	1.081	324.38	452.13	1.872E+05
6.	1.486	1.052	264.59	786.67	1.154E+06
7.	1.494	1.049	285.14	807.06	1.181E+06
8.	1.499	1.071	262.42	778.37	1.846E+06
9.	1.504	1.054	281.68	795.38	1.222E+06
10.	1.510	1.040	317.42	814.21	9.377E+05

* ** END OF FILE ***





W.O. 8838
Sec. B6-B6'

XSTABL File: 8838B6 4-12-** 15:28

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Â 1545  *
*****************************************
```

Problem Description : Sec. B6-B6' W=70'D=5/W=50'D=5'

SEGMENT BOUNDARY COORDINATES

24 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1662.0	90.0	1662.0	1
2	90.0	1662.0	285.0	1658.0	2
3	285.0	1658.0	301.0	1650.0	2
4	301.0	1650.0	338.0	1650.0	2
5	338.0	1650.0	362.0	1663.0	1
6	362.0	1663.0	370.0	1663.0	1
7	370.0	1663.0	421.0	1688.0	1
8	421.0	1688.0	429.0	1688.0	1
9	429.0	1688.0	481.0	1712.0	1
10	481.0	1712.0	501.0	1712.0	1
11	501.0	1712.0	553.0	1739.0	1
12	553.0	1739.0	561.0	1739.0	1
13	561.0	1739.0	612.0	1763.0	1
14	612.0	1763.0	620.0	1763.0	1
15	620.0	1763.0	670.0	1789.0	1
16	670.0	1789.0	678.0	1789.0	1
17	678.0	1789.0	738.0	1817.0	1
18	738.0	1817.0	790.0	1830.0	3
19	790.0	1830.0	1050.0	1920.0	3
20	1050.0	1920.0	1200.0	1950.0	3
21	1200.0	1950.0	1380.0	1950.0	3
22	1380.0	1950.0	1570.0	1840.0	3
23	1570.0	1840.0	1720.0	1775.0	2
24	1720.0	1775.0	1820.0	1775.0	2

8 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1640.0	90.0	1662.0	2
2	338.0	1650.0	338.1	1645.0	2
3	338.1	1645.0	408.0	1645.0	2
4	408.0	1645.0	501.0	1707.0	2
5	501.0	1707.0	551.0	1707.0	2
6	551.0	1707.0	675.0	1775.0	2
7	675.0	1775.0	738.0	1817.0	3
8	675.0	1775.0	1570.0	1840.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	135.0	200.0	34.00	.000	.0	1
2	130.0	140.0	200.0	40.00	.000	.0	1
3	130.0	140.0	225.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	200.0	40.00
2	15.00	100.0	25.00
3	90.00	200.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	5.00	225.0	40.00
2	10.00	100.0	25.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 5 coordinate points

****
PHREATIC SURFACE,
****

Point No.	x-water (ft)	y-water (ft)
1	.00	1650.00
2	285.00	1658.00
3	338.00	1650.00
4	356.00	1658.00
5	1500.00	1658.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	320.0	1600.0	525.0	1670.0	80.0
2	550.0	1670.0	1100.0	1860.0	100.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	318.24	1650.00
2	359.26	1630.87
3	976.00	1793.46
4	977.64	1796.98
5	1019.91	1887.61
6	1027.67	1904.27
7	1027.67	1912.27

** Corrected JANBU FOS = 1.660 ** (Fo factor = 1.051)

Failure surface No. 2 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	330.17	1650.00
2	338.08	1645.79
3	339.57	1645.00
4	367.04	1632.19
5	906.22	1773.43
6	915.09	1792.44
7	955.61	1879.33
8	955.61	1887.33

** Corrected JANBU FOS = 1.670 ** (Fo factor = 1.054)

Failure surface No. 3 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	342.01	1652.17
2	353.49	1646.06
3	738.50	1748.05
4	753.74	1780.72
5	770.74	1817.19
6	770.74	1825.19

** Corrected JANBU FOS = 1.673 ** (Fo factor = 1.053)

Failure surface No. 4 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	302.51	1650.00
2	343.18	1631.04
3	760.75	1739.31
4	780.98	1782.70
5	801.10	1825.84
6	801.10	1833.84

** Corrected JANBU FOS = 1.678 ** (Fo factor = 1.056)

Failure surface No. 5 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	324.30	1650.00
2	362.73	1632.08
3	966.99	1787.04
4	971.41	1796.53
5	1013.67	1887.16
6	1020.50	1901.79
7	1020.50	1909.79

** Corrected JANBU FOS = 1.680 ** (Fo factor = 1.053)

Failure surface No. 6 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)

1	337.59	1650.00
2	338.00	1649.78
3	346.99	1645.00
4	353.68	1637.22
5	847.31	1762.83
6	859.23	1788.38
7	891.25	1857.05
8	891.25	1865.05

** Corrected JANBU FOS = 1.681 ** (Fo factor = 1.054)

Failure surface No. 7 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	280.12	1658.10
2	341.29	1629.57
3	968.53	1793.22
4	970.03	1796.43
5	1012.29	1887.06
6	1018.90	1901.23
7	1018.90	1909.23

** Corrected JANBU FOS = 1.682 ** (Fo factor = 1.050)

Failure surface No. 8 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	307.06	1650.00
2	361.09	1624.81
3	817.96	1745.31
4	837.30	1786.79
5	865.99	1848.30
6	865.99	1856.30

** Corrected JANBU FOS = 1.683 ** (Fo factor = 1.058)

Failure surface No. 9 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	339.38	1650.75
2	350.19	1645.00
3	374.82	1633.51
4	836.45	1753.39
5	852.53	1787.89
6	883.54	1854.38
7	883.54	1862.38

** Corrected JANBU FOS = 1.686 ** (Fo factor = 1.058)

Failure surface No.10 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	324.30	1650.00
2	335.52	1644.76
3	731.03	1747.81
4	746.12	1780.17
5	762.41	1815.10
6	762.41	1823.10

** Corrected JANBU FOS = 1.686 ** (Fo factor = 1.051)

The following is a summary of the TEN most critical surfaces

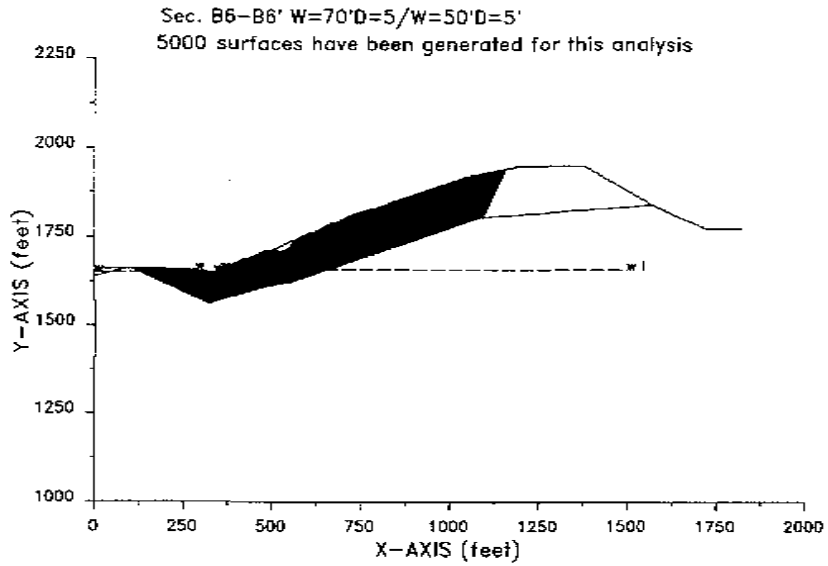
Problem Description : Sec. B6-B6' W=70'D=5/W=50'D=5'

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.660	1.051	318.24	1027.67	2.930E+06
2.	1.670	1.054	330.17	955.61	2.527E+06
3.	1.673	1.053	342.01	770.74	1.095E+06
4.	1.678	1.056	302.51	801.10	1.577E+06
5.	1.680	1.053	324.30	1020.50	2.964E+06
6.	1.681	1.054	337.59	891.25	1.995E+06
7.	1.682	1.050	280.12	1018.90	2.820E+06
8.	1.683	1.058	307.06	865.99	2.193E+06
9.	1.686	1.058	339.38	883.54	2.140E+06
10.	1.686	1.051	324.30	762.41	1.011E+06

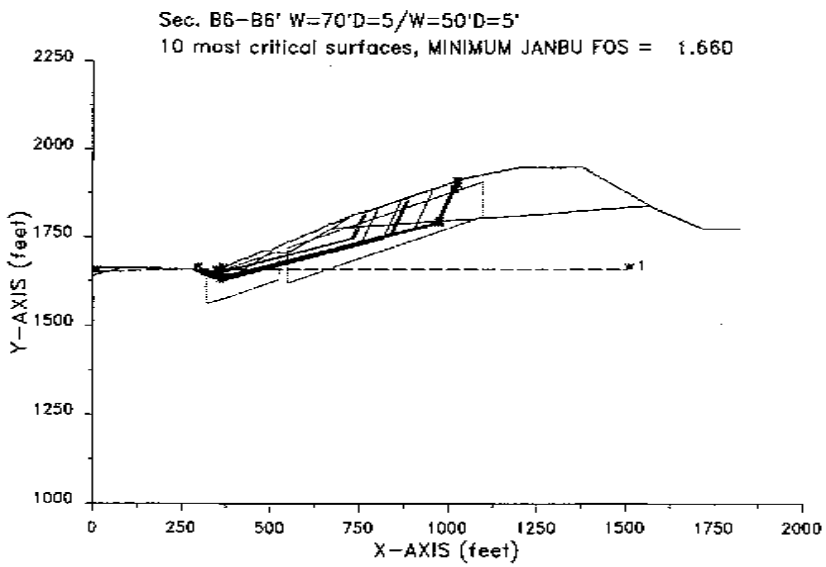
* * * END OF FILE * * *

W.O. 8838
Sec. B6-B6'

883886 4-12-** 15:28



883886 4-12-** 15:28



W.O. 8838

Sec. B6-B6' Pseudostatic

XSTABL File: 8838B6P 4-12-** 15:28

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*         Copyright (C) 1992 A 96       *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 A 1545  *
*****************************************
```

Problem Description : Sec. B6-B6' W=70'D=5/W=50'D=5'Pseudo

SEGMENT BOUNDARY COORDINATES

24 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1662.0	90.0	1662.0	1
2	90.0	1662.0	285.0	1658.0	2
3	285.0	1658.0	301.0	1650.0	2
4	301.0	1650.0	338.0	1650.0	2
5	338.0	1650.0	362.0	1663.0	1
6	362.0	1663.0	370.0	1663.0	1
7	370.0	1663.0	421.0	1688.0	1
8	421.0	1688.0	429.0	1688.0	1
9	429.0	1688.0	481.0	1712.0	1
10	481.0	1712.0	501.0	1712.0	1
11	501.0	1712.0	553.0	1739.0	1
12	553.0	1739.0	561.0	1739.0	1
13	561.0	1739.0	612.0	1763.0	1
14	612.0	1763.0	620.0	1763.0	1
15	620.0	1763.0	670.0	1789.0	1
16	670.0	1789.0	678.0	1789.0	1
17	678.0	1789.0	738.0	1817.0	1
18	738.0	1817.0	790.0	1830.0	3
19	790.0	1830.0	1050.0	1920.0	3
20	1050.0	1920.0	1200.0	1950.0	3
21	1200.0	1950.0	1380.0	1950.0	3
22	1380.0	1950.0	1570.0	1840.0	3
23	1570.0	1840.0	1720.0	1775.0	2
24	1720.0	1775.0	1820.0	1775.0	2

8 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1640.0	90.0	1662.0	2
2	338.0	1650.0	338.1	1645.0	2
3	338.1	1645.0	408.0	1645.0	2
4	408.0	1645.0	501.0	1707.0	2
5	501.0	1707.0	551.0	1707.0	2
6	551.0	1707.0	675.0	1775.0	2
7	675.0	1775.0	738.0	1817.0	3
8	675.0	1775.0	1570.0	1840.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	135.0	200.0	34.00	.000	.0	1
2	130.0	140.0	200.0	40.00	.000	.0	1
3	130.0	140.0	225.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	200.0	40.00
2	15.00	100.0	25.00
3	90.00	200.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	5.00	225.0	40.00
2	10.00	100.0	25.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 5 coordinate points

****
PHREATIC SURFACE,
****

Point No.	x-water (ft)	y-water (ft)
1	.00	1650.00
2	285.00	1658.00
3	338.00	1650.00
4	356.00	1658.00
5	1500.00	1658.00

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	320.0	1600.0	525.0	1670.0	80.0
2	550.0	1670.0	1100.0	1860.0	100.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	318.24	1650.00
2	359.26	1630.87
3	976.00	1793.46
4	977.54	1796.98
5	1019.91	1887.61
6	1027.67	1904.27
7	1027.67	1912.27

** Corrected JANBU FOS = 1.093 ** (Fo factor = 1.051)

Failure surface No. 2 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	330.17	1650.00
2	338.08	1645.79
3	339.57	1645.00
4	367.04	1632.19
5	906.22	1773.43
6	915.09	1792.44
7	955.61	1879.33
8	955.61	1887.33

** Corrected JANBU FOS = 1.103 ** (Fo factor = 1.054)

Failure surface No. 3 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	324.30	1650.00
2	362.73	1632.08
3	966.99	1787.04
4	971.41	1796.53
5	1013.67	1887.16
6	1020.50	1901.79
7	1020.50	1909.79

** Corrected JANBU FOS = 1.105 ** (Fo factor = 1.053)

Failure surface No. 4 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	280.12	1658.10
2	341.29	1629.57
3	968.53	1793.22
4	970.03	1796.43
5	1012.29	1887.06
6	1018.90	1901.23
7	1018.90	1909.23

** Corrected JANBU FOS = 1.106 ** (Fo factor = 1.050)

Failure surface No. 5 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	337.59	1650.00
2	338.00	1649.78
3	346.99	1645.00
4	363.68	1637.22
5	847.31	1762.83
6	859.23	1788.38

7	891.25	1857.05
8	891.25	1865.05

** Corrected JANBU FOS = 1.112 ** (Fo factor = 1.054)

Failure surface No. 6 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	282.04	1658.06
2	345.65	1628.40
3	889.59	1768.36
4	900.32	1791.36
5	938.59	1872.43
6	938.59	1881.43

** Corrected JANBU FOS = 1.113 ** (Fo factor = 1.054)

Failure surface No. 7 specified by 9 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	337.59	1650.00
2	338.00	1649.78
3	346.99	1645.00
4	377.28	1630.88
5	965.29	1782.44
6	971.87	1796.56
7	1014.14	1887.19
8	1021.03	1901.97
9	1021.03	1909.97

** Corrected JANBU FOS = 1.114 ** (Fo factor = 1.055)

Failure surface No. 8 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	303.87	1650.00
2	363.56	1622.17
3	946.80	1774.36
4	956.64	1795.43
5	998.90	1886.09
6	1003.48	1895.90
7	1003.48	1903.90

** Corrected JANBU FOS = 1.114 ** (Fo factor = 1.056)

Failure surface No. 9 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	324.30	1650.00
2	349.13	1638.42
3	849.01	1767.43
4	858.76	1788.35
5	890.71	1836.86
6	890.71	1864.86

** Corrected JANBU FOS = 1.115 ** (Fo factor = 1.052)

Failure surface No.10 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	302.51	1650.00
2	343.18	1631.04
3	760.75	1739.31
4	780.98	1782.70
5	801.10	1825.84
6	801.10	1833.84

** Corrected JANBU FOS = 1.116 ** (Fo factor = 1.056)

The following is a summary of the TEN most critical surfaces

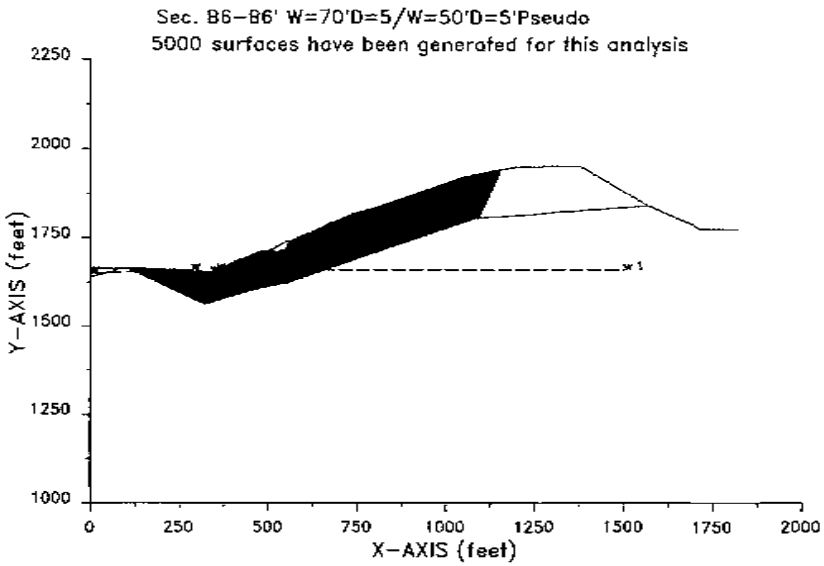
Problem Description : Sec. B6-B6' W=70'D=5/W=50'D=5'Pseudo

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.093	1.051	318.24	1027.67	2.776E+06
2.	1.103	1.054	330.17	955.61	2.396E+06
3.	1.105	1.053	324.30	1020.50	2.807E+06
4.	1.106	1.050	280.12	1018.90	2.673E+06
5.	1.112	1.054	337.59	891.25	1.868E+06
6.	1.113	1.054	282.04	938.59	2.322E+06
7.	1.114	1.055	337.59	1021.03	2.974E+06
8.	1.114	1.056	303.87	1003.48	3.050E+06
9.	1.115	1.052	324.30	890.71	1.770E+06
10.	1.116	1.056	302.51	801.10	1.493E+06

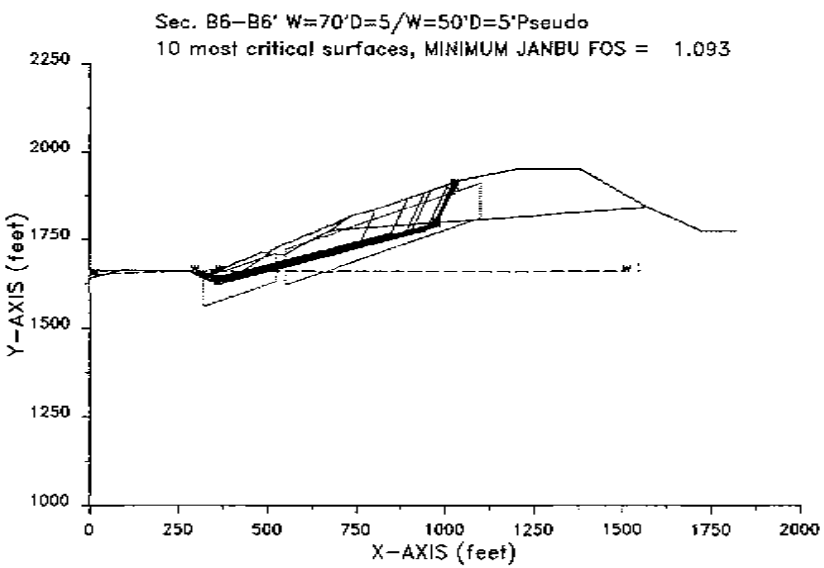
* * * END OF FILE * * *

W.O. 8838
Sec. B6-B6' Pseudostatic

883B6P 4-12-** 15:28



883B6P 4-12-** 15:28



W.O. 8838

Sec. B6-B6' Pseudo. Spencer's

XSTABL File: 8838B6PS 4-12-** 15:29

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*        Copyright (C) 1992 - 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
* Ver. 5.201                96 - 1545   *
*****************************************
```

Problem Description : Sec. B6-B6' W=70'D=5/W=50'D=5'Ps Spe

SEGMENT BOUNDARY COORDINATES

24 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1662.0	90.0	1662.0	1
2	90.0	1662.0	285.0	1658.0	2
3	285.0	1658.0	301.0	1650.0	2
4	301.0	1650.0	338.0	1650.0	2
5	338.0	1650.0	362.0	1663.0	1
6	362.0	1663.0	370.0	1663.0	1
7	370.0	1663.0	421.0	1688.0	1
8	421.0	1688.0	429.0	1688.0	1
9	429.0	1688.0	481.0	1712.0	1
10	481.0	1712.0	501.0	1712.0	1
11	501.0	1712.0	553.0	1739.0	1
12	553.0	1739.0	561.0	1739.0	1
13	561.0	1739.0	612.0	1763.0	1
14	612.0	1763.0	620.0	1763.0	1
15	620.0	1763.0	670.0	1789.0	1
16	670.0	1789.0	678.0	1789.0	1
17	678.0	1789.0	738.0	1817.0	1
18	738.0	1817.0	790.0	1830.0	3
19	790.0	1830.0	1050.0	1920.0	3
20	1050.0	1920.0	1200.0	1950.0	3
21	1200.0	1950.0	1380.0	1950.0	3
22	1380.0	1950.0	1570.0	1840.0	3
23	1570.0	1840.0	1720.0	1775.0	2
24	1720.0	1775.0	1820.0	1775.0	2

8 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1640.0	90.0	1662.0	2
2	338.0	1650.0	338.1	1645.0	2
3	338.1	1645.0	408.0	1645.0	2
4	408.0	1645.0	501.0	1707.0	2
5	501.0	1707.0	551.0	1707.0	2
6	551.0	1707.0	675.0	1775.0	2
7	675.0	1775.0	738.0	1817.0	3
8	675.0	1775.0	1570.0	1840.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	135.0	200.0	34.00	.000	.0	1
2	130.0	140.0	200.0	40.00	.000	.0	1
3	130.0	140.0	225.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	φ-value (degrees)
1	10.00	200.0	40.00
2	15.00	100.0	25.00
3	90.00	200.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	φ-value (degrees)
1	5.00	225.0	40.00
2	10.00	100.0	25.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

W.O. 8838

Sec. B6-B6' Pseudo. Spencer's

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 5 coordinate points

****
PHREATIC SURFACE,
****

Point No.	x-water (ft)	y-water (ft)
1	.00	1650.00
2	285.00	1658.00
3	338.00	1650.00
4	356.00	1658.00
5	1500.00	1658.00

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

---
A SINGLE FAILURE SURFACE HAS BEEN SPECIFIED FOR ANALYSIS

Trial failure surface specified by the following 8 coordinate points :

Point No.	x-surf (ft)	y-surf (ft)
1	318.24	1650.00
2	359.26	1630.87
3	976.00	1793.46
4	977.64	1796.98
5	1019.91	1887.61
6	1027.67	1904.27
7	1027.67	1904.27
8	1027.67	1912.27

****
SELECTED METHOD OF ANALYSIS: Spencer (1973)
****

****
SUMMARY OF INDIVIDUAL SLICE INFORMATION
****

Slice	x-base (ft)	y-base (ft)	height (ft)	width (ft)	alpha	beta	weight (lb)
1	328.12	1645.39	4.61	19.76	-25.00	.00	12747.
2	338.05	1640.76	9.27	.10	-25.00	28.44	128.
3	347.05	1636.56	18.34	17.90	-25.00	28.44	44911.
4	357.63	1631.63	29.00	3.26	-25.00	28.44	12896.
5	360.63	1631.23	31.03	2.74	14.77	28.44	11549.
6	366.00	1632.65	30.35	8.00	14.77	.00	32976.
7	389.00	1638.71	33.60	38.00	14.77	26.31	168141.
8	414.50	1645.43	39.38	13.00	14.77	26.11	65881.
9	425.00	1648.20	39.80	8.00	14.77	.00	40908.
10	445.59	1653.63	42.03	33.17	14.77	24.78	178430.
11	471.59	1660.48	47.17	18.83	14.77	24.78	113565.
12	491.00	1665.60	46.40	20.00	14.77	.00	119472.
13	526.00	1674.83	50.15	50.00	14.77	27.44	321501.
14	552.00	1681.68	56.80	2.00	14.77	27.44	14458.
15	557.00	1683.00	56.00	8.00	14.77	.00	57092.
16	586.50	1690.78	60.22	51.00	14.77	25.20	393024.
17	616.00	1698.55	64.45	8.00	14.77	.00	56210.
18	645.00	1706.20	69.80	50.00	14.77	27.47	449343.
19	672.50	1713.45	75.55	5.00	14.77	.00	48724.
20	676.50	1714.50	74.50	3.00	14.77	.00	28859.
21	708.00	1722.81	80.19	60.00	14.77	25.02	623701.
22	764.00	1737.57	85.93	52.00	14.77	14.04	580881.
23	883.00	1768.94	93.25	186.00	14.77	19.09	2254779.
24	976.82	1795.22	99.45	1.64	65.02	19.09	21203.
25	998.78	1842.30	59.97	42.27	65.00	19.09	329559.
26	1023.79	1895.94	14.99	7.75	65.02	19.09	15119.

ITERATIONS FOR SPENCER'S METHOD

Iter #	Theta	FOS_force	FOS_moment
2	27.6732	1.2877	1.1442
3	21.9821	-----	1.2877
3	24.8276	1.2171	-----
4	23.9776	1.2001	1.2171
5	24.6366	-----	1.2001
5	24.3071	1.2065	-----
6	24.3784	1.2079	1.2065
7	24.3507	1.2075	1.2079

SLICE INFORMATION ... continued :

Slice	Sigma (psf)	c-value (psf)	phi	U-base (lb)	U-top (lb)	P-top (lb)	Delta
1	3677.6	200.0	40.00	8113.	1839.	0.	.00
2	6443.0	200.0	40.00	53.	0.	0.	.00
3	11792.5	200.0	40.00	17967.	0.	0.	.00
4	16901.3	200.0	40.00	5919.	0.	0.	.00
5	1982.8	100.0	25.00	4733.	0.	0.	.00
6	1983.4	100.0	25.00	13089.	0.	0.	.00
7	2669.0	100.0	25.00	47302.	0.	0.	.00
8	3690.6	100.0	25.00	10543.	0.	0.	.00
9	3916.1	100.0	25.00	5059.	0.	0.	.00
10	4515.1	100.0	25.00	9359.	0.	0.	.00
11	5387.6	100.0	25.00	0.	0.	0.	.00
12	5336.4	100.0	25.00	0.	0.	0.	.00
13	5743.0	100.0	25.00	0.	0.	0.	.00
14	6454.9	100.0	25.00	0.	0.	0.	.00
15	6372.3	100.0	25.00	0.	0.	0.	.00
16	6860.0	100.0	25.00	0.	0.	0.	.00
17	7387.6	100.0	25.00	0.	0.	0.	.00
18	8020.7	100.0	25.00	0.	0.	0.	.00
19	8695.9	100.0	25.00	0.	0.	0.	.00
20	8584.3	100.0	25.00	0.	0.	0.	.00
21	9275.1	100.0	25.00	0.	0.	0.	.00
22	9956.2	100.0	25.00	0.	0.	0.	.00
23	10814.0	100.0	25.00	0.	0.	0.	.00
24	3738.5	200.0	40.00	0.	0.	0.	.00
25	2210.0	225.0	40.00	0.	0.	0.	.00
26	489.4	225.0	40.00	0.	0.	0.	.00

SPENCER'S (1973) - TOTAL Stresses at center of slice base

W.O. 8838

Sec. B6-B6' Pseudo. Spencer's

Slice #	Base x-coord (ft)	Normal Stress (psf)	Vertical Stress (psf)	Pore Water Pressure (psf)	Shear Stress (psf)
1	328.12	4049.7	738.1	372.1	2721.2
2	338.05	6925.5	1284.5	482.6	4642.8
3	347.05	12702.2	2509.0	909.7	8360.2
4	357.63	18546.8	3955.9	1645.5	11910.3
5	360.63	3653.2	4214.9	1670.4	848.5
6	366.00	3565.4	4109.4	1582.0	848.7
7	389.00	3872.7	4424.8	1203.7	1113.5
8	414.50	4474.8	5067.8	784.2	1508.0
9	425.00	4527.6	5113.5	611.5	1595.1
10	443.59	4787.9	5379.2	272.8	1826.4
11	471.59	5387.6	6031.1	.0	2163.4
12	491.00	5335.4	5973.6	.0	2143.6
13	526.00	5743.0	6430.0	.0	2300.6
14	552.00	6454.9	7229.2	.0	2575.5
15	557.00	6372.3	7136.5	.0	2543.6
16	586.50	6880.0	7706.3	.0	2739.7
17	616.00	7387.6	8276.2	.0	2935.7
18	645.00	8020.7	8986.9	.0	3180.2
19	672.50	8695.9	9744.8	.0	3440.9
20	676.50	8584.3	9619.6	.0	3397.8
21	708.00	9275.1	10395.0	.0	3664.6
22	754.00	9966.2	11170.8	.0	3931.5
23	883.00	10814.0	12122.5	.0	4258.9
24	976.82	3738.5	12928.3	.0	2763.5
25	998.78	2210.0	7796.5	.0	1722.0
26	1023.79	489.4	1948.3	.0	526.4

SPENCER'S (1973) - Magnitude & Location of Interslice Forces

Slice #	Right x-coord (ft)	Force Angle (degrees)	Interslice Force (lb)	Force Height (ft)	Boundary Height (ft)	Height Ratio
1	338.00	24.35	97885.	9.02	9.22	.979
2	338.10	24.35	98728.	9.04	9.32	.970
3	356.00	24.35	371984.	12.62	27.36	.461
4	359.25	24.35	443431.	13.27	30.65	.433
5	362.00	24.35	441185.	13.79	31.41	.439
6	370.00	24.35	434971.	15.32	29.30	.523
7	408.00	24.35	411148.	22.45	37.91	.592
8	421.00	24.35	404986.	24.74	40.85	.606
9	429.00	24.35	401777.	26.13	38.74	.674
10	462.17	24.35	392940.	31.49	45.31	.695
11	481.00	24.35	389599.	34.20	49.04	.698
12	501.00	24.35	386102.	37.13	43.76	.848
13	551.00	24.35	376337.	44.15	56.54	.781
14	553.00	24.35	375875.	44.41	57.05	.778
15	561.00	24.35	374059.	45.44	54.95	.827
16	612.00	24.35	361181.	51.51	65.50	.786
17	620.00	24.35	358957.	52.38	63.39	.826
18	670.00	24.35	343462.	56.94	76.21	.747
19	675.00	24.35	341743.	57.29	74.89	.765
20	678.00	24.35	340728.	57.51	74.10	.776
21	738.00	24.35	318347.	60.40	86.28	.700
22	790.00	24.35	297141.	61.98	85.57	.714
23	976.00	24.35	213358.	46.13	100.92	.457
24	977.64	24.35	200397.	45.38	97.97	.463
25	1019.91	24.35	6188.	9.32	21.97	.424
26	1027.67	.00	-699.	-.29	8.00	-.037

AVERAGE VALUES ALONG FAILURE SURFACE

Total Normal Stress = 7335.36 (psf)
Pore Water Pressure = 151.66 (psf)
Shear Stress = 3126.85 (psf)

Total Length of failure surface = 805.34 feet

For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S (1973) procedure gives a

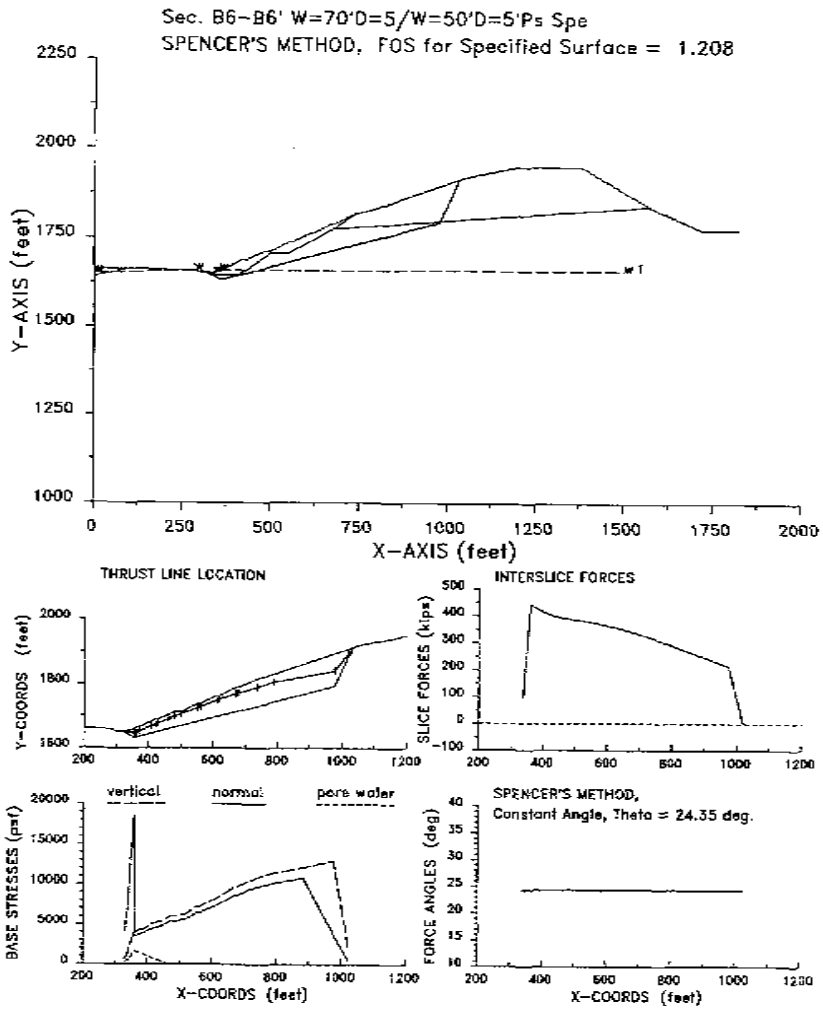
FACTOR OF SAFETY = 1.208

Total shear strength available along specified failure surface = 297.18E+04 lb

W.O. 8838

Sec. B6-B6' Pseudo. Spencer's

8838B6PS 4-12-** 15:29



Sec. B6-B6' W=70'D=5/W=50'D=5'Ps Spe
SPENCER'S METHOD, FOS for Specified Surface = 1.208

XSTABL File: 883836B 4-12-** 16:16

```
*****************************************
*              X S T A B L              *
*                                       *
*       Slope Stability Analysis        *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 A 96        *
*   Interactive Software Designs, Inc.  *
*       Moscow, ID 83843, U.S.A.        *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Â 1545  *
*****************************************
```

Problem Description : Sec. B6-B6' Backcut

SEGMENT BOUNDARY COORDINATES
---

16 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1662.0	90.0	1662.0	1
2	90.0	1662.0	285.0	1658.0	2
3	285.0	1658.0	301.0	1650.0	2
4	301.0	1650.0	338.0	1650.0	2
5	338.0	1650.0	338.1	1645.0	2
6	338.1	1645.0	408.0	1645.0	2
7	408.0	1645.0	501.0	1707.0	2
8	501.0	1707.0	551.0	1707.0	2
9	551.0	1707.0	675.0	1775.0	2
10	675.0	1775.0	738.0	1817.0	3
11	738.0	1817.0	1050.0	1920.0	3
12	1050.0	1920.0	1200.0	1950.0	3
13	1200.0	1950.0	1380.0	1950.0	3
14	1380.0	1950.0	1570.0	1840.0	3
15	1570.0	1840.0	1720.0	1775.0	2
16	1720.0	1775.0	1820.0	1775.0	2

2 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1640.0	90.0	1662.0	2
2	675.0	1775.0	1570.0	1840.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

---
ISOTROPIC Soil Parameters
---

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	135.0	200.0	34.00	.000	.0	1
2	130.0	140.0	200.0	40.00	.000	.0	1
3	130.0	140.0	225.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 2 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	10.00	200.0	40.00
2	15.00	100.0	25.00
3	90.00	200.0	40.00

Soil Unit 3 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	5.00	225.0	40.00
2	10.00	100.0	25.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of

sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	410.0	1600.0	520.0	1650.0	80.0
2	600.0	1660.0	1100.0	1860.0	100.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	407.00	1645.00
2	418.84	1639.48
3	684.47	1709.80
4	716.27	1778.00
5	727.45	1801.97
6	727.45	1809.97

** Corrected JANBU FOS = 1.480 ** (Fo factor = 1.070)

Failure surface No. 2 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	417.34	1651.23
2	431.70	1644.53
3	754.97	1728.31
4	780.32	1782.65
5	802.54	1830.31
6	802.54	1838.31

** Corrected JANBU FOS = 1.497 ** (Fo factor = 1.068)

Failure surface No. 3 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	426.88	1657.58
2	439.06	1651.90
3	771.78	1736.72
4	793.65	1783.62
5	817.76	1835.33
6	817.76	1843.33

** Corrected JANBU FOS = 1.518 ** (Fo factor = 1.067)

Failure surface No. 4 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	390.73	1645.00
2	410.55	1635.76
3	778.29	1729.24
4	803.99	1784.37
5	829.58	1839.23
6	829.58	1847.23

** Corrected JANBU FOS = 1.519 ** (Fo factor = 1.067)

Failure surface No. 5 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	423.57	1655.38
2	443.18	1646.24
3	770.10	1733.68
4	793.36	1783.60
5	817.45	1835.23
6	817.45	1843.23

** Corrected JANBU FOS = 1.519 ** (Fo factor = 1.067)

Failure surface No. 6 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	392.92	1645.00
2	418.36	1633.14
3	776.74	1724.61
4	804.63	1784.41
5	830.30	1839.47
6	830.30	1847.47

** Corrected JANBU FOS = 1.530 ** (Fo factor = 1.068)

Failure surface No. 7 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	435.32	1663.22
2	454.71	1654.17
3	723.47	1720.79
4	751.33	1780.54
5	769.44	1819.38
6	769.44	1827.38

** Corrected JANBU FOS = 1.531 ** (Fo factor = 1.073)

Failure surface No. 8 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	405.41	1645.00
2	438.12	1629.75
3	726.75	1705.63
4	752.05	1781.32
5	781.68	1823.42
6	781.68	1831.42

** Corrected JANBU FOS = 1.550 ** (Fo factor = 1.074)

Failure surface No. 9 specified by 6 coordinate points

W.O. 8838
Sec. B6-B6' Backcut

Point No.	x-surf (ft)	y-surf (ft)
1	396.65	1645.00
2	420.22	1634.01
3	768.55	1718.02
4	799.33	1784.03
5	824.25	1837.47
6	824.25	1845.47

** Corrected JANBU FOS = 1.552 ** (Fo factor = 1.071)

Failure surface No.10 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	409.30	1645.86
2	417.94	1641.83
3	778.56	1726.07
4	805.81	1784.50
5	831.65	1839.92
6	831.65	1847.92

** Corrected JANBU FOS = 1.552 ** (Fo factor = 1.069)

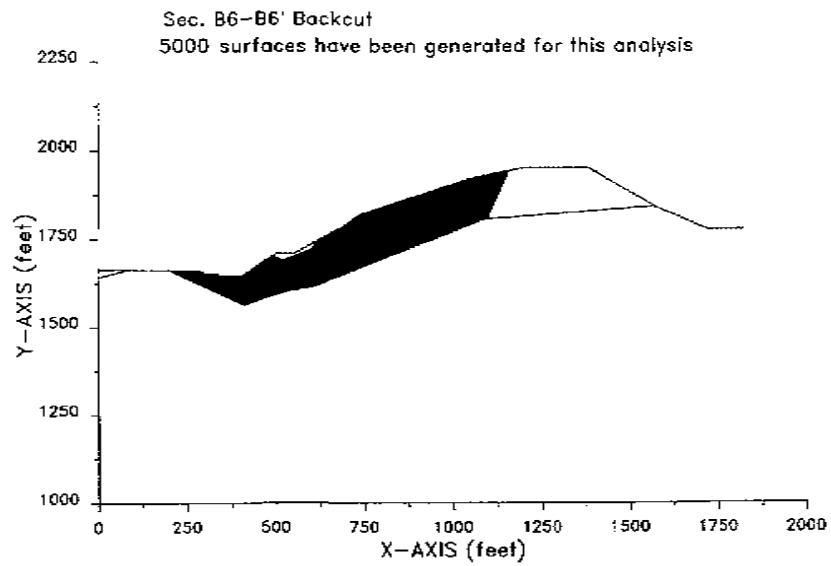
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. B6-B6' Backcut

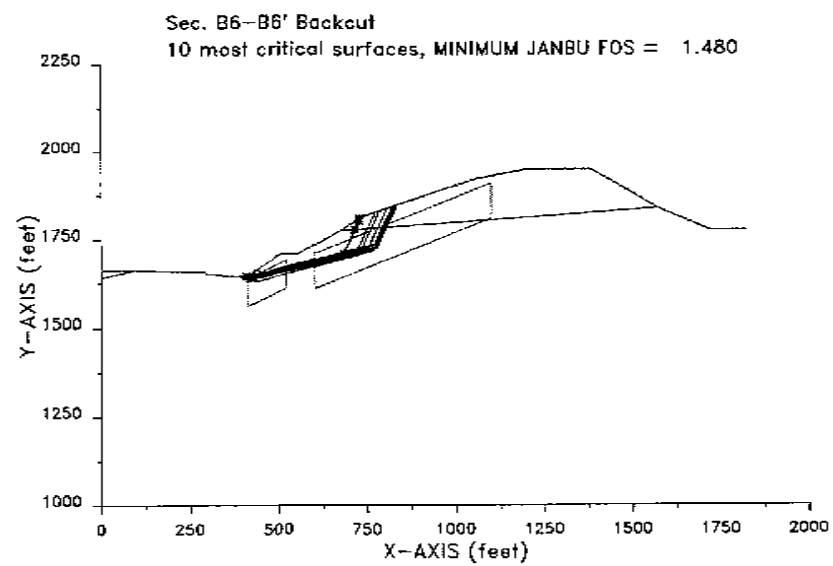
	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.480	1.070	407.00	727.45	8.886E+05
2.	1.497	1.068	417.34	802.54	1.308E+06
3.	1.518	1.067	426.88	817.76	1.283E+06
4.	1.519	1.067	390.73	829.58	1.588E+06
5.	1.519	1.067	423.57	817.45	1.396E+06
6.	1.530	1.068	392.92	830.30	1.710E+06
7.	1.531	1.073	435.32	769.44	1.075E+06
8.	1.550	1.074	405.41	781.68	1.581E+06
9.	1.552	1.071	396.65	824.25	1.728E+06
10.	1.552	1.069	409.30	831.65	1.591E+06

* * * END OF FILE * * *

8838B6B 4-12-** 16:16



8838B6B 4-12-** 16:16



W.O. 8838

Sec. C-C' W=110' D=5'

XSTABL File: 8838C 4-13-** 14:11

```
*****************************************
*              X S T A B L              *
*                                       *
*       Slope Stability Analysis        *
*             using the                 *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 A 96        *
*   Interactive Software Designs, Inc.  *
*       Moscow, ID 83843, U.S.A.        *
*                                       *
*         All Rights Reserved           *
*                                       *
*  Ver. 5.201                96 A 1545  *
*****************************************
```

Problem Description : Sec. C-C' W=110' D=5'

SEGMENT BOUNDARY COORDINATES

15 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1936.0	280.0	1943.0	1
2	280.0	1943.0	355.0	1975.0	1
3	355.0	1975.0	365.0	1975.0	1
4	365.0	1975.0	381.0	1962.0	1
5	381.0	1962.0	510.0	1962.0	1
6	510.0	1962.0	530.0	1962.0	2
7	530.0	1962.0	576.0	1984.0	1
8	576.0	1984.0	584.0	1984.0	1
9	584.0	1984.0	635.0	2010.0	1
10	635.0	2010.0	643.0	2010.0	1
11	643.0	2010.0	693.0	2032.0	1
12	693.0	2032.0	701.0	2032.0	1
13	701.0	2032.0	725.0	2040.0	1
14	725.0	2040.0	800.0	2025.0	1
15	800.0	2025.0	1015.0	1985.0	2

8 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1875.0	280.0	1938.0	2
2	280.0	1938.0	310.0	1938.0	2
3	310.0	1938.0	381.0	1957.0	2
4	381.0	1957.0	509.0	1957.0	2
5	509.0	1957.0	510.0	1962.0	2
6	530.0	1962.0	530.1	1957.0	2
7	530.1	1957.0	640.0	1957.0	2
8	640.0	1957.0	800.0	2025.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)

Maximum depth of water in crack = .00 (feet)

Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	130.0	200.0	34.00	.000	.0	0
2	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	f-value (degrees)
1	21.00	225.0	40.00
2	24.00	150.0	11.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	540.0	1930.0	670.0	1950.0	50.0
2	730.0	2010.0	930.0	1980.0	50.0

W.O. 8838
Sec. C-C' W=110' D=5'

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	526.81	1962.00
2	530.03	1960.29
3	536.21	1957.00
4	583.82	1934.80
5	777.81	2011.57
6	780.14	2016.56
7	782.26	2020.55
8	782.26	2028.55

** Corrected JANBU FOS = 1.598 ** (Fo factor = 1.060)

Failure surface No. 2 specified by 4 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	510.49	1962.00
2	577.60	1930.71
3	797.76	2017.45
4	797.76	2025.45

** Corrected JANBU FOS = 1.602 ** (Fo factor = 1.060)

Failure surface No. 3 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	484.25	1962.00
2	493.66	1957.00
3	562.32	1924.98
4	792.32	2018.54
5	792.32	2026.54

** Corrected JANBU FOS = 1.610 ** (Fo factor = 1.064)

Failure surface No. 4 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	486.94	1962.00
2	496.34	1957.00
3	563.52	1925.67
4	735.21	1991.70
5	738.57	1998.89
6	753.17	2026.37
7	753.17	2034.37

** Corrected JANBU FOS = 1.657 ** (Fo factor = 1.072)

Failure surface No. 5 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	533.65	1963.75
2	546.34	1957.00
3	592.67	1935.40
4	761.05	2005.43
5	762.80	2009.19
6	770.13	2022.97
7	770.13	2030.97

** Corrected JANBU FOS = 1.666 ** (Fo factor = 1.066)

Failure surface No. 6 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	535.21	1964.49
2	549.30	1957.00
3	594.87	1935.75
4	758.26	2004.27
5	760.00	2008.00
6	768.17	2023.37
7	768.17	2031.37

** Corrected JANBU FOS = 1.687 ** (Fo factor = 1.068)

Failure surface No. 7 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	541.55	1967.53
2	561.35	1957.00
3	598.90	1939.49
4	736.45	1997.73
5	736.61	1998.05
6	751.80	2026.64
7	751.80	2034.64

** Corrected JANBU FOS = 1.692 ** (Fo factor = 1.072)

Failure surface No. 8 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	491.21	1962.00
2	500.61	1957.00
3	573.75	1922.90
4	795.20	2017.95
5	795.20	2025.96

** Corrected JANBU FOS = 1.693 ** (Fo factor = 1.067)

Failure surface No. 9 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	522.18	1962.00
2	530.08	1957.80
3	531.59	1957.00

W.O. 8838
Sec. C-C' W=110' D=5'

4	588.96	1930.25
5	803.33	2016.38
6	803.33	2024.38

** Corrected JANBU FOS = 1.697 ** (Fo factor = 1.061)

Failure surface No.10 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	541.93	1967.70
2	562.06	1957.00
3	599.13	1939.71
4	775.17	2007.93
5	778.96	2016.06
6	781.44	2020.71
7	781.44	2028.71

** Corrected JANBU FOS = 1.703 ** (Fo factor = 1.054)

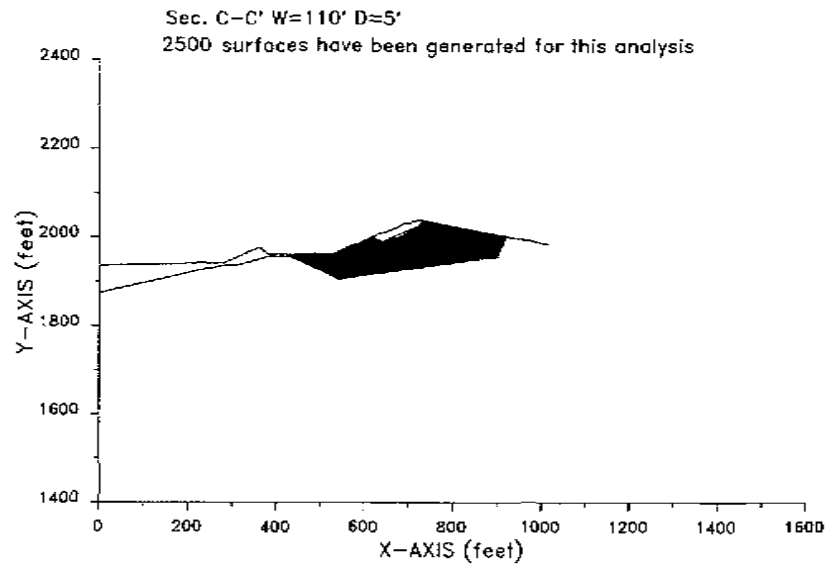
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. C-C' W=110' D=5'

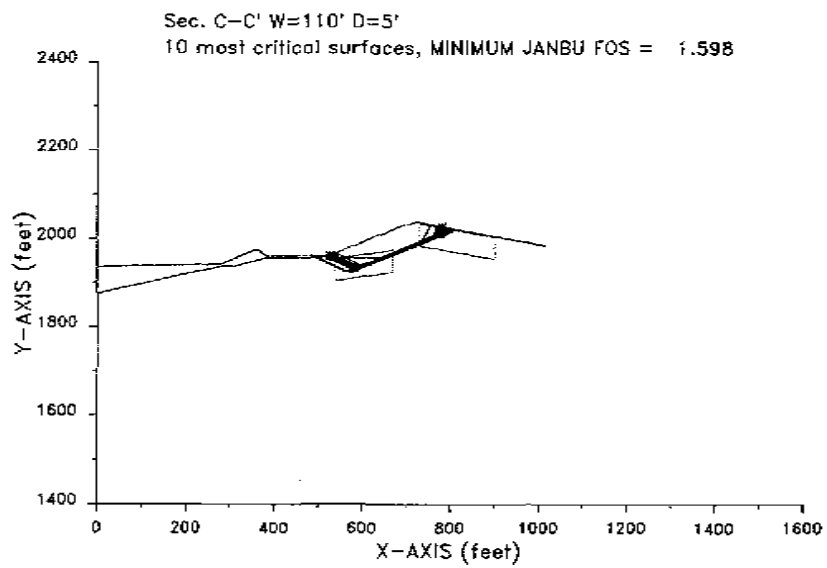
	Modified JANBU FOS	Correction factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.598	1.060	526.81	782.26	5.189E+05
2.	1.602	1.060	510.49	797.76	5.620E+05
3.	1.610	1.064	484.25	792.32	5.976E+05
4.	1.657	1.072	486.94	753.17	6.029E+05
5.	1.666	1.066	533.65	770.13	5.315E+05
6.	1.687	1.068	535.21	768.17	5.335E+05
7.	1.692	1.072	541.55	751.80	4.907E+05
8.	1.693	1.067	491.21	795.20	6.637E+05
9.	1.697	1.061	522.18	803.33	6.093E+05
10.	1.703	1.054	541.93	781.44	5.046E+05

* * * END OF FILE * * *

8838C 4-13-** 14:11



8838C 4-13-** 14:11



W.O. 8838

Sec. C-C' Pseudostatic

XSTABL File: 8838CP 4-13-** 14:11

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 Â 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 Â 1545  *
*****************************************
```

Problem Description : Sec. C-C' W=110' D=5' Pseudo

SEGMENT BOUNDARY COORDINATES

15 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1936.0	280.0	1943.0	1
2	280.0	1943.0	355.0	1975.0	1
3	355.0	1975.0	365.0	1975.0	1
4	365.0	1975.0	381.0	1962.0	1
5	381.0	1962.0	510.0	1962.0	1
6	510.0	1962.0	530.0	1962.0	2
7	530.0	1962.0	576.0	1984.0	1
8	576.0	1984.0	584.0	1984.0	1
9	584.0	1984.0	635.0	2010.0	1
10	635.0	2010.0	643.0	2010.0	1
11	643.0	2010.0	693.0	2032.0	1
12	693.0	2032.0	701.0	2032.0	1
13	701.0	2032.0	725.0	2040.0	1
14	725.0	2040.0	800.0	2025.0	1
15	800.0	2025.0	1015.0	1985.0	2

8 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1875.0	280.0	1938.0	2
2	280.0	1938.0	310.0	1938.0	2
3	310.0	1938.0	381.0	1957.0	2
4	381.0	1957.0	509.0	1957.0	2
5	509.0	1957.0	510.0	1962.0	2
6	530.0	1962.0	530.1	1957.0	2
7	530.1	1957.0	640.0	1957.0	2
8	640.0	1957.0	800.0	2025.0	2

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)

Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	130.0	200.0	34.00	.000	.0	0
2	130.0	140.0	225.0	40.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 2 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	21.00	225.0	40.00
2	24.00	150.0	11.00
3	90.00	225.0	40.00

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

W.O. 8838
Sec. C-C' Pseudostatic

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	540.0	1930.0	670.0	1950.0	50.0
2	730.0	2010.0	900.0	1980.0	50.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 4 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	510.49	1962.00
2	577.60	1930.71
3	797.76	2017.45
4	797.76	2025.45

** Corrected JANBU FOS = 1.118 ** (Fo factor = 1.060)

Failure surface No. 2 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	525.81	1962.00
2	530.03	1960.29
3	535.21	1957.00
4	583.82	1934.80
5	777.81	2011.57
6	780.14	2016.56
7	782.26	2020.55
8	782.26	2028.55

** Corrected JANBU FOS = 1.119 ** (Fo factor = 1.060)

Failure surface No. 3 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	484.25	1962.00
2	493.65	1957.00
3	562.32	1924.98
4	792.32	2018.54
5	792.32	2026.54

** Corrected JANBU FOS = 1.131 ** (Fo factor = 1.064)

Failure surface No. 4 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	541.93	1967.70
2	562.06	1957.00
3	599.13	1939.71
4	775.17	2007.93
5	778.96	2016.06
6	781.44	2020.71
7	781.44	2028.71

** Corrected JANBU FOS = 1.171 ** (Fo factor = 1.064)

Failure surface No. 5 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	522.18	1962.00
2	530.08	1957.80
3	531.59	1957.00
4	588.96	1930.25
5	803.33	2016.38
6	803.33	2024.38

** Corrected JANBU FOS = 1.174 ** (Fo factor = 1.061)

Failure surface No. 6 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	486.94	1962.00
2	496.34	1957.00
3	563.52	1925.67
4	735.21	1991.70
5	738.57	1998.89
6	753.17	2026.37
7	753.17	2034.37

** Corrected JANBU FOS = 1.174 ** (Fo factor = 1.072)

Failure surface No. 7 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	533.65	1963.75
2	546.34	1957.00
3	592.67	1935.40
4	761.05	2005.43
5	762.80	2009.19
6	770.13	2022.97
7	770.13	2030.97

** Corrected JANBU FOS = 1.175 ** (Fo factor = 1.066)

Failure surface No. 8 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	536.24	1964.99
2	551.26	1957.00
3	597.35	1935.51
4	788.58	2011.82
5	791.76	2018.65
6	791.76	2026.65

** Corrected JANBU FOS = 1.187 ** (Fo factor = 1.063)

W.O. 8838
Sec. C-C' Pseudostatic

Failure surface No. 9 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	528.10	1962.00
2	530.02	1960.98
3	537.50	1957.00
4	593.36	1930.95
5	803.48	2015.35
6	803.48	2024.35

** Corrected JANBU FOS = 1.190 ** (Fo factor = 1.062)

Failure surface No.10 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	491.21	1962.00
2	500.61	1957.00
3	573.75	1922.90
4	795.20	2017.96
5	795.20	2025.96

** Corrected JANBU FOS = 1.190 ** (Fo factor = 1.067)

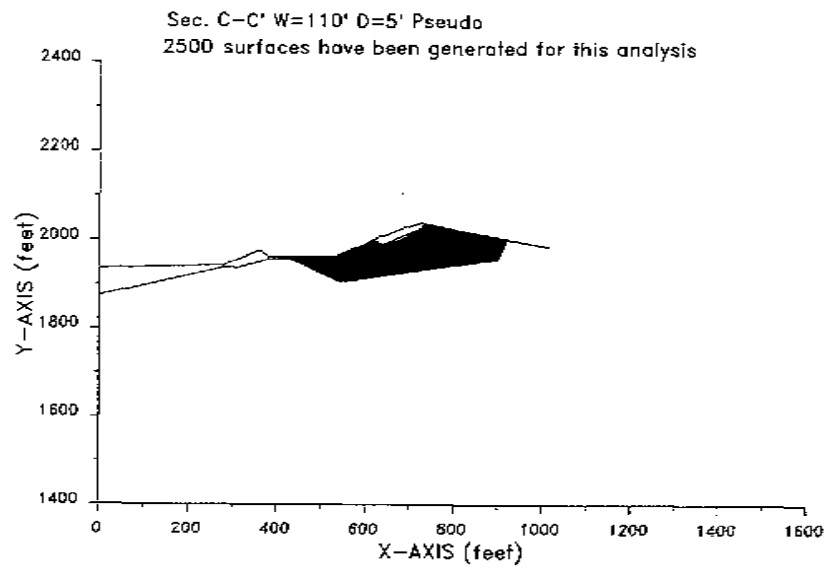
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. C-C' W=110' D=5' Pseudo

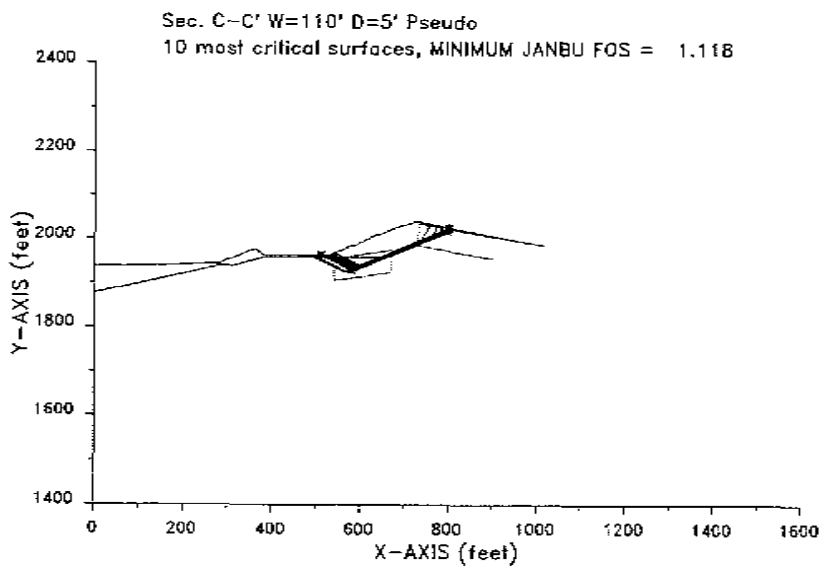
	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.118	1.060	510.49	797.76	6.053E+05
2.	1.119	1.060	526.81	782.26	5.564E+05
3.	1.131	1.064	484.25	792.32	6.433E+05
4.	1.171	1.064	541.93	781.44	5.398E+05
5.	1.174	1.061	522.18	803.33	6.565E+05
6.	1.174	1.072	486.94	753.17	6.364E+05
7.	1.175	1.066	533.65	770.13	5.676E+05
8.	1.187	1.063	536.24	791.76	5.997E+05
9.	1.190	1.062	528.10	803.48	6.594E+05
10.	1.190	1.067	491.21	795.20	7.145E+05

* * * END OF FILE * * *

8838CP 4-13-** 14:11



8838CP 4-13-** 14:11



GEOLABS-WESTLAKE VILLAGE

Plate Cp.3

W.O. 8838

Sec. C3-C3' W=90' D=5'

XSTABL File: BB38C3 4-13-** 9:22

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 A 96        *
*   Interactive Software Designs, Inc.  *
*       Moscow, ID 83843, U.S.A.        *
*                                       *
*         All Rights Reserved           *
*                                       *
* Ver. 5.201                96 A 1545   *
*****************************************
```

Problem Description : Sec. C3-C3' W=90' D=5'

SEGMENT BOUNDARY COORDINATES
---

12 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1870.0	100.0	1870.0	1
2	100.0	1870.0	120.0	1880.0	1
3	120.0	1880.0	205.0	1880.0	1
4	205.0	1880.0	238.0	1895.0	2
5	238.0	1895.0	246.0	1895.0	2
6	246.0	1895.0	296.0	1919.0	2
7	296.0	1919.0	304.0	1919.0	2
8	304.0	1919.0	336.0	1935.0	2
9	336.0	1935.0	475.0	1935.0	2
10	475.0	1935.0	624.0	1935.0	1
11	624.0	1935.0	665.0	1957.0	1
12	665.0	1957.0	695.0	1957.0	2

6 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	205.0	1880.0	205.1	1875.0	1
2	205.1	1875.0	295.0	1875.0	1
3	295.0	1875.0	475.0	1935.0	1
4	624.0	1935.0	624.1	1930.0	1
5	624.1	1930.0	654.0	1930.0	1
6	654.0	1930.0	695.0	1957.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

---
ISOTROPIC Soil Parameters
---

2 Soil Unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	12.00	225.0	40.00
2	16.00	150.0	11.00
3	90.00	225.0	40.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	210.0	1850.0	350.0	1875.0	50.0
2	380.0	1902.0	600.0	1902.0	50.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

W.O. 8838
Sec. C3-C3' W=90' D=5'

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	197.70	1880.00
2	205.08	1876.08
3	207.10	1875.00
4	242.47	1858.51
5	457.04	1919.81
6	460.39	1927.00
7	460.39	1935.00

** Corrected JANBU FOS = 1.708 ** (Fo factor = 1.047)

Failure surface No. 2 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	172.56	1880.00
2	225.34	1855.39
3	495.71	1923.55
4	497.31	1927.00
5	497.31	1935.00

** Corrected JANBU FOS = 1.714 ** (Fo factor = 1.043)

Failure surface No. 3 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	177.38	1880.00
2	230.40	1855.28
3	417.69	1908.55
4	421.75	1917.25
5	426.93	1927.00
6	426.93	1935.00

** Corrected JANBU FOS = 1.714 ** (Fo factor = 1.056)

Failure surface No. 4 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	183.44	1880.00
2	229.99	1858.30
3	396.68	1901.46
4	400.78	1910.26
5	409.68	1927.00
6	409.68	1935.00

** Corrected JANBU FOS = 1.715 ** (Fo factor = 1.056)

Failure surface No. 5 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	176.73	1880.00
2	227.69	1856.24
3	385.74	1898.14
4	389.66	1906.55
5	400.53	1927.00
6	400.53	1935.00

** Corrected JANBU FOS = 1.733 ** (Fo factor = 1.060)

Failure surface No. 6 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	166.35	1880.00
2	215.14	1857.25
3	446.28	1908.52
4	454.90	1927.00
5	454.90	1935.00

** Corrected JANBU FOS = 1.739 ** (Fo factor = 1.046)

Failure surface No. 7 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	199.91	1880.00
2	205.05	1877.26
3	209.31	1875.00
4	236.71	1862.22
5	471.21	1913.17
6	477.66	1927.00
7	477.66	1935.00

** Corrected JANBU FOS = 1.742 ** (Fo factor = 1.038)

Failure surface No. 8 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	191.97	1880.00
2	231.97	1861.35
3	478.42	1916.47
4	483.33	1927.00
5	483.33	1935.00

** Corrected JANBU FOS = 1.755 ** (Fo factor = 1.038)

Failure surface No. 9 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	202.17	1880.00
2	205.03	1878.48
3	211.57	1875.00
4	241.83	1860.89
5	492.28	1919.44
6	495.81	1927.00
7	495.81	1935.00

** Corrected JANBU FOS = 1.769 ** (Fo factor = 1.038)

W.O. 8838
Sec. C3-C3' W=90' D=5'

Failure surface No.10 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	213.66	1833.94
2	230.47	1875.00
3	254.18	1853.94
4	468.10	1921.49
5	470.67	1927.00
6	470.67	1935.00

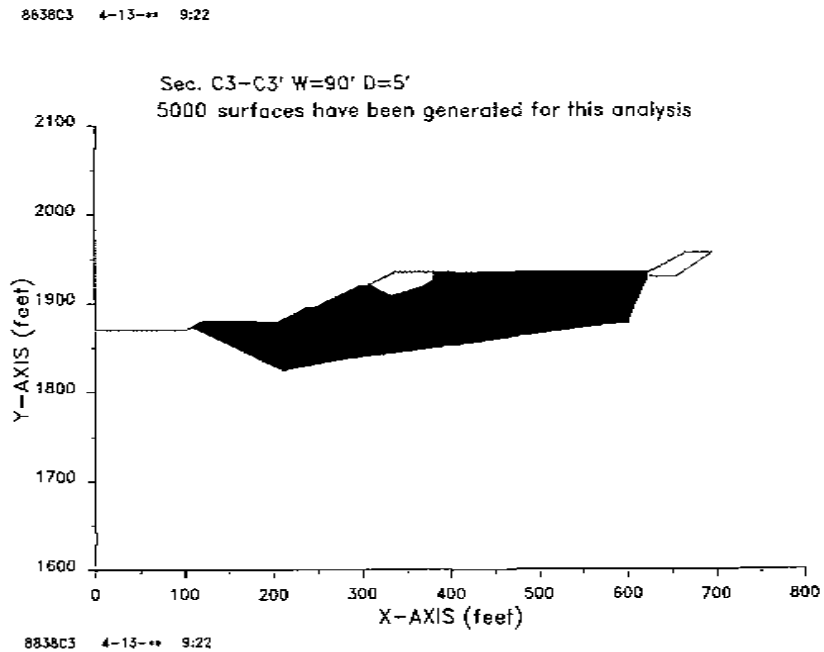
** Corrected JANBU FOS = 1.769 ** (Fo factor = 1.045)

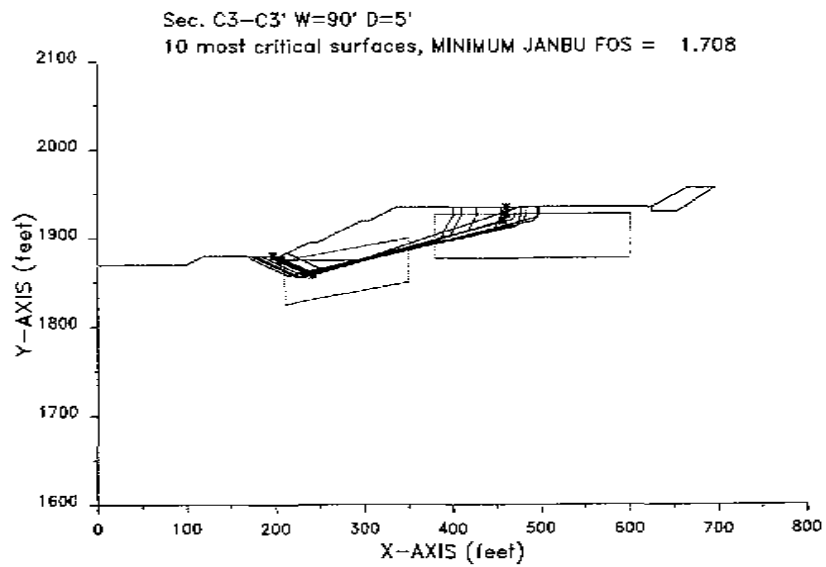
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. C3-C3' W=90' D=5'

	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.708	1.047	197.70	460.39	3.718E+05
2.	1.714	1.043	172.56	497.31	4.142E+05
3.	1.714	1.056	177.38	426.93	3.756E+05
4.	1.715	1.056	183.44	409.68	3.439E+05
5.	1.732	1.060	176.73	403.53	3.539E+05
6.	1.739	1.046	166.35	454.90	3.794E+05
7.	1.742	1.038	199.91	477.66	3.652E+05
8.	1.755	1.038	191.97	483.33	3.771E+05
9.	1.769	1.038	202.17	495.81	3.889E+05
10.	1.769	1.045	213.66	470.67	3.441E+05

* * * END OF FILE * * *





W.O. 8838

Sec. C3-C3' Pseudo.

XSTABL File: 8838C3P 4-13-** 9:22

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 À 96        *
*   Interactive Software Designs, Inc.  *
*       Moscow, ID 83843, U.S.A.        *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 À 1545  *
*****************************************
```

Problem Description : Sec. C3-C3' W=90' D=5' Pseudo

SEGMENT BOUNDARY COORDINATES

12 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1870.0	100.0	1870.0	1
2	100.0	1870.0	120.0	1880.0	1
3	120.0	1880.0	205.0	1880.0	1
4	205.0	1880.0	238.0	1895.0	2
5	238.0	1895.0	246.0	1895.0	2
6	246.0	1895.0	296.0	1919.0	2
7	296.0	1919.0	304.0	1919.0	2
8	304.0	1919.0	336.0	1935.0	2
9	336.0	1935.0	475.0	1935.0	2
10	475.0	1935.0	624.0	1935.0	1
11	624.0	1935.0	665.0	1957.0	1
12	665.0	1957.0	695.0	1957.0	2

6 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	205.0	1880.0	205.1	1875.0	1
2	205.1	1875.0	295.0	1875.0	1
3	295.0	1875.0	475.0	1935.0	1
4	624.0	1935.0	624.1	1930.0	1
5	624.1	1930.0	654.0	1930.0	1
6	654.0	1930.0	695.0	1957.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	12.00	225.0	40.00
2	16.00	150.0	11.00
3	90.00	225.0	40.00

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

5000 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)

1	210.0	1850.0	350.0	1875.0	50.0
2	380.0	1902.0	600.0	1902.0	50.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	199.91	1880.00
2	205.05	1877.26
3	209.31	1875.00
4	236.71	1862.22
5	471.21	1913.17
6	477.66	1927.00
7	477.66	1935.00

** Corrected JANBU FOS = 1.028 ** (Fo factor = 1.038)

Failure surface No. 2 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	175.33	1880.00
2	224.73	1856.96
3	523.68	1920.69
4	526.62	1927.00
5	526.62	1935.00

** Corrected JANBU FOS = 1.033 ** (Fo factor = 1.038)

Failure surface No. 3 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	191.97	1880.00
2	231.97	1861.35
3	478.42	1916.47
4	483.33	1927.00
5	483.33	1935.00

** Corrected JANBU FOS = 1.039 ** (Fo factor = 1.038)

Failure surface No. 4 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	167.01	1880.00
2	220.03	1855.28
3	523.62	1921.51
4	526.18	1927.00
5	526.18	1935.00

** Corrected JANBU FOS = 1.046 ** (Fo factor = 1.039)

Failure surface No. 5 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	166.35	1880.00
2	215.14	1857.25
3	446.28	1909.52
4	454.90	1927.00
5	454.90	1935.00

** Corrected JANBU FOS = 1.046 ** (Fo factor = 1.046)

Failure surface No. 6 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	172.56	1880.00
2	225.34	1855.39
3	495.71	1923.55
4	497.31	1927.00
5	497.31	1935.00

** Corrected JANBU FOS = 1.052 ** (Fo factor = 1.043)

Failure surface No. 7 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	202.17	1880.00
2	205.03	1878.48
3	211.57	1875.00
4	241.83	1860.89
5	492.28	1919.44
6	495.81	1927.00
7	495.81	1935.00

** Corrected JANBU FOS = 1.054 ** (Fo factor = 1.038)

Failure surface No. 8 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	209.80	1882.18
2	223.30	1875.00
3	246.45	1864.20
4	506.89	1923.59
5	508.48	1927.00
6	508.48	1935.00

** Corrected JANBU FOS = 1.063 ** (Fo factor = 1.035)

Failure surface No. 9 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	163.04	1880.00
2	212.77	1856.81
3	449.89	1910.17
4	457.73	1927.00

5	457.73	1935.00

** Corrected JANBU FOS = 1.069 ** (Fo factor = 1.045)

Failure surface No.10 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	187.52	1880.00
2	236.96	1856.94
3	533.94	1922.01
4	536.27	1927.00
5	536.27	1935.00

** Corrected JANBU FOS = 1.071 ** (Fo factor = 1.038)

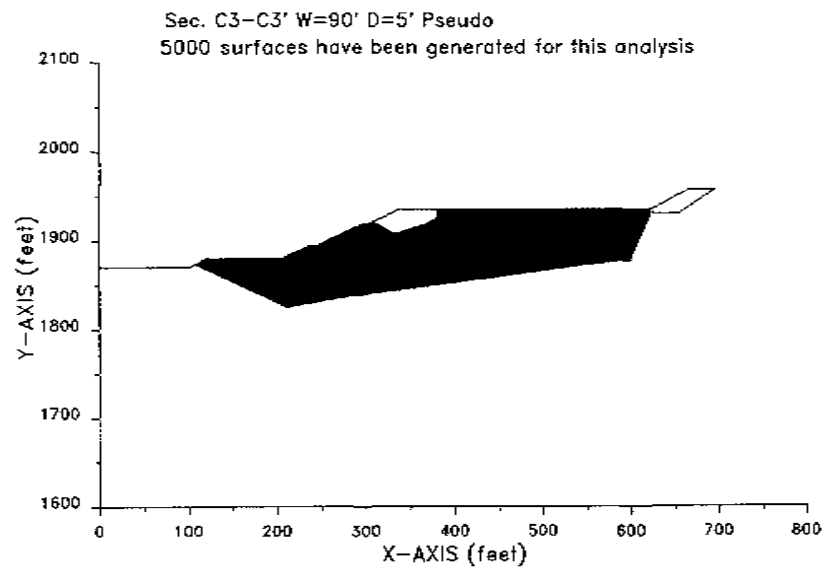
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. C3-C3' W=90' D=5' Pseudo

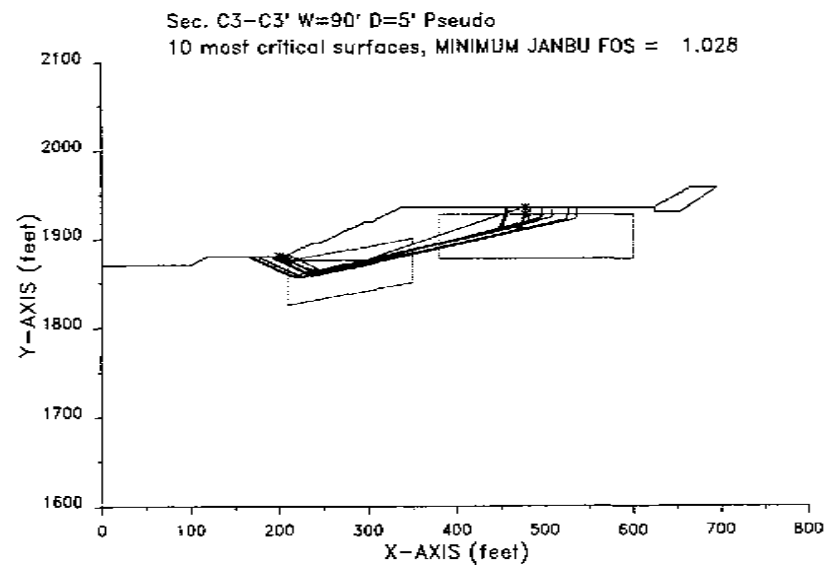
	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.028	1.038	199.91	477.66	3.835E+05
2.	1.033	1.038	175.33	526.62	4.662E+05
3.	1.039	1.038	191.97	483.33	3.942E+05
4.	1.046	1.039	167.01	526.18	4.801E+05
5.	1.046	1.046	166.35	454.90	3.973E+05
6.	1.052	1.043	172.56	497.31	4.413E+05
7.	1.054	1.038	202.17	495.81	4.124E+05
8.	1.063	1.035	209.80	508.48	3.934E+05
9.	1.069	1.045	163.04	457.73	4.085E+05
10.	1.071	1.038	187.52	536.27	4.951E+05

* * * END OF FILE * * *

8838C3P 4-13-** 9:22



8838C3P 4-13-** 9:22



W.O. 8838

Sec. C3-C3' Pseudo. Spencer's

XSTABL File: 8838C3PS 4-13-** 9:23

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 A 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*         All Rights Reserved           *
*                                       *
*  Ver. 5.201                96 A 1545  *
*****************************************
```

Problem Description : Sec. C3-C3' W=90' D=5' Pseudo Spenc

SEGMENT BOUNDARY COORDINATES

12 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1870.0	100.0	1870.0	1
2	100.0	1870.0	120.0	1880.0	1
3	120.0	1880.0	205.0	1880.0	1
4	205.0	1880.0	238.0	1895.0	2
5	238.0	1895.0	246.0	1895.0	2
6	246.0	1895.0	296.0	1919.0	2
7	296.0	1919.0	304.0	1919.0	2
8	304.0	1919.0	336.0	1935.0	2
9	336.0	1935.0	475.0	1935.0	2
10	475.0	1935.0	624.0	1935.0	1
11	624.0	1935.0	665.0	1957.0	1
12	665.0	1957.0	695.0	1957.0	2

6 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	205.0	1880.0	205.1	1875.0	1
2	205.1	1875.0	295.0	1875.0	1
3	295.0	1875.0	475.0	1935.0	1
4	624.0	1935.0	624.1	1930.0	1
5	624.1	1930.0	654.0	1930.0	1
6	654.0	1930.0	695.0	1957.0	1

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

2 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	12.00	225.0	40.00
2	16.00	150.0	11.00
3	90.00	225.0	40.00

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A SINGLE FAILURE SURFACE HAS BEEN SPECIFIED FOR ANALYSIS

Trial failure surface specified by the following 8 coordinate points :

Point No.	x-surf (ft)	y-surf (ft)
1	199.91	1880.00
2	205.05	1877.26
3	209.31	1875.00
4	236.71	1862.22
5	471.21	1913.17
6	477.66	1927.00
7	477.66	1927.00
8	477.66	1935.00

****
SELECTED METHOD OF ANALYSIS: Spencer (1973)

****

****
SUMMARY OF INDIVIDUAL SLICE INFORMATION
****

Slice	x-base (ft)	y-base (ft)	height (ft)	width (ft)	alpha	beta	weight (lb)
1	202.46	1878.64	1.36	5.09	-28.06	.00	898.
2	205.03	1877.27	2.74	.05	-28.06	24.44	19.
3	207.18	1876.13	4.86	4.26	-27.95	24.44	2587.
4	223.01	1868.61	19.58	27.40	-25.01	24.44	67925.
5	237.36	1862.36	32.35	1.29	12.26	24.44	5297.
6	242.00	1863.37	31.63	8.00	12.26	.00	32096.
7	270.50	1869.56	37.20	49.00	12.26	25.64	229173.
8	295.50	1874.99	43.77	1.00	12.26	25.64	5472.
9	300.00	1875.97	43.03	8.00	12.26	.00	43057.
10	320.00	1880.32	46.68	32.00	12.26	26.57	187217.
11	403.60	1898.48	36.52	135.21	12.26	.00	625809.
12	473.10	1917.23	17.77	3.79	65.00	.00	8742.
13	476.33	1924.15	10.85	2.66	65.00	.00	3753.

ITERATIONS FOR SPENCER'S METHOD

Iter #	Theta	FOS_force	FOS_moment
2	15.0947	1.2600	1.1724
3	14.5403	-----	1.2600
3	14.8175	1.2532	-----
4	14.5784	1.2475	1.2532
5	14.5949	1.2479	1.2475

SLICE INFORMATION ... continued :

Slice	Sigma (psf)	c-value (psf)	phi	U-base (lb)	U-top (lb)	P-top (lb)	Delta
1	953.8	225.0	40.00	0.	0.	0.	.00
2	1461.1	225.0	40.00	0.	0.	0.	.00
3	1636.7	200.0	34.00	0.	0.	0.	.00
4	6446.8	225.0	40.00	0.	0.	0.	.00
5	3763.7	150.0	11.00	0.	0.	0.	.00
6	3677.1	150.0	11.00	0.	0.	0.	.00
7	4285.8	150.0	11.00	0.	0.	0.	.00
8	5013.2	150.0	11.00	0.	0.	0.	.00
9	4931.2	150.0	11.00	0.	0.	0.	.00
10	5360.0	150.0	11.00	0.	0.	0.	.00
11	4241.4	150.0	11.00	0.	0.	0.	.00
12	664.4	225.0	40.00	0.	0.	0.	.00
13	360.7	225.0	40.00	0.	0.	0.	.00

SPENCER'S (1973) - TOTAL Stresses at center of slice base

Slice #	Base x-coord (ft)	Normal Stress (psf)	Vertical Stress (psf)	Pore Water Pressure (psf)	Shear Stress (psf)
1	202.46	953.8	176.4	.0	821.7
2	205.03	1461.1	349.3	.0	1162.7
3	207.18	1636.7	607.9	.0	1044.9
4	223.01	6446.8	2479.0	.0	4515.2
5	237.36	3763.7	4106.5	.0	706.4
6	242.00	3677.1	4012.0	.0	693.0
7	270.50	4285.8	4677.0	.0	787.8
8	295.50	5013.2	5471.7	.0	901.1
9	300.00	4931.2	5382.1	.0	888.3
10	320.00	5360.0	5850.5	.0	955.1
11	403.60	4241.4	4628.4	.0	780.9
12	473.10	664.4	2306.5	.0	627.0
13	476.33	360.7	1410.7	.0	422.8

SPENCER'S (1973) - Magnitude & Location of Interslice Forces

Slice #	Right x-coord (ft)	Force Angle (degrees)	Interslice Force (lb)	Force Height (ft)	Boundary Height (ft)	Height Ratio
1	205.00	14.59	6857.	2.01	2.71	.739
2	205.05	14.59	6964.	2.02	2.77	.729
3	209.31	14.59	14976.	3.34	6.96	.480
4	236.71	14.59	217426.	10.41	32.19	.323
5	238.00	14.59	216457.	10.45	32.50	.322
6	246.00	14.59	210606.	10.72	30.76	.349
7	295.00	14.59	167823.	11.94	43.64	.274
8	296.00	14.59	166780.	11.94	43.90	.272
9	304.00	14.59	158593.	12.01	42.16	.285
10	336.00	14.59	122647.	11.61	51.21	.227
11	471.21	14.59	5992.	7.65	21.83	.350
12	475.00	14.59	1514.	4.56	13.70	.333
13	477.66	.00	-31.	.23	8.00	.029

AVERAGE VALUES ALONG FAILURE SURFACE

Total Normal Stress = 4304.00 (psf)
Pore Water Pressure = .00 (psf)
Shear Stress = 1176.11 (psf)

Total Length of failure surface = 296.11 feet

For the single specified surface and the assumed angle of the interslice forces, the SPENCER'S (1973) procedure gives a

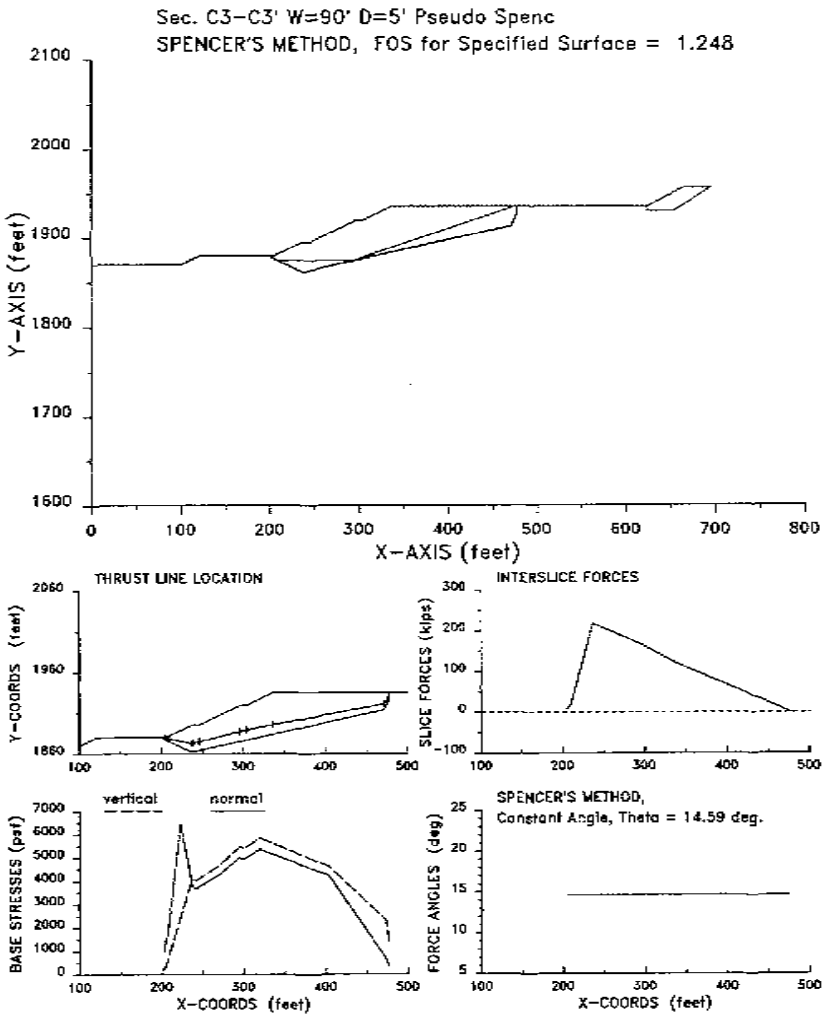
FACTOR OF SAFETY = 1.248

Total shear strength available along specified failure surface = 434.60E+03 lb

W.O. 8838

Sec. C3-C3' Pseudo. Spencer's

8838C3PS 4-13-** 9:23



Sec. C3-C3' W=90' D=5' Pseudo Spenc
SPENCER'S METHOD, FOS for Specified Surface = 1.248

W.O. 8838
Sec. D-D' W=100' D=5'

XSTABL File: 8838D 4-13-** 14:56

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*               using the               *
*            Method of Slices           *
*                                       *
*         Copyright (C) 1992 À 96       *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*          All Rights Reserved          *
*                                       *
*  Ver. 5.201                96 À 1545  *
*****************************************
```

Problem Description : Sec. D-D' W=100' D=5'

SEGMENT BOUNDARY COORDINATES

18 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1954.0	310.0	1955.0	1
2	310.0	1955.0	347.0	1974.0	2
3	347.0	1974.0	355.0	1974.0	2
4	355.0	1974.0	406.0	2000.0	2
5	406.0	2000.0	414.0	2000.0	2
6	414.0	2000.0	465.0	2024.0	2
7	465.0	2024.0	473.0	2024.0	2
8	473.0	2024.0	525.0	2050.0	2
9	525.0	2050.0	545.0	2050.0	2
10	545.0	2050.0	596.0	2075.0	2
11	596.0	2075.0	604.0	2075.0	2
12	604.0	2075.0	655.0	2100.0	2
13	655.0	2100.0	663.0	2100.0	2
14	663.0	2100.0	715.0	2125.0	2
15	715.0	2125.0	760.0	2120.0	2
16	760.0	2120.0	880.0	2080.0	1
17	880.0	2080.0	1000.0	2100.0	3
18	1000.0	2100.0	1120.0	2110.0	3

5 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	310.0	1955.0	310.1	1950.0	1
2	310.1	1950.0	410.0	1950.0	1
3	410.0	1950.0	760.0	2120.0	1
4	880.0	2080.0	1120.0	2080.0	1
5	.0	1880.0	1120.0	2020.0	4

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

4 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	1
2	125.0	135.0	200.0	34.00	.000	.0	1
3	125.0	135.0	200.0	30.00	.000	.0	1
4	130.0	140.0	200.0	40.00	.000	.0	1

ANISOTROPIC STRENGTH PARAMETERS
specified for 1 Soil Unit(s)

Soil Unit 1 is ANISOTROPIC

Number of direction ranges specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	c-value (psf)	i-value (degrees)
1	6.00	225.0	40.00
2	11.00	150.0	17.00
3	90.00	225.0	40.00

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 3 coordinate points

PHREATIC SURFACE

Point No.	x-water (ft)	y-water (ft)
1	.00	1905.00
2	410.00	1950.00
3	1120.00	2050.00

A critical failure surface searching method, using a random technique for generating sliding BLOCK surfaces, has been specified.

W.O. 8838
Sec. D-D' W=100' D=5'

The active and passive portions of the sliding surfaces are generated according to the Rankine theory.

2500 trial surfaces will be generated and analyzed.

2 boxes specified for generation of central block base

Length of line segments for active and passive portions of sliding block is 100.0 ft

Box no.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Width (ft)
1	360.0	1935.0	600.0	2007.0	80.0
2	620.0	2020.0	980.0	2040.0	80.0

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED JANBU METHOD * * * * *

The 10 most critical of all the failure surfaces examined are displayed below - the most critical first

Failure surface No. 1 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	333.37	1967.00
2	365.34	1950.00
3	376.31	1944.88
4	691.03	2000.65
5	733.29	2091.29
6	742.78	2111.64
7	743.93	2113.79
8	743.93	2121.79

** Corrected JANBU FOS = 1.583 ** (Fo factor = 1.075)

Failure surface No. 2 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	356.13	1974.58
2	397.49	1952.59
3	651.46	2001.74
4	690.97	2086.47
5	704.53	2111.97
6	704.53	2119.97

** Corrected JANBU FOS = 1.648 ** (Fo factor = 1.079)

Failure surface No. 3 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	354.12	1974.00
2	371.15	1964.95
3	713.28	2030.17
4	751.86	2112.90
5	751.86	2120.90

** Corrected JANBU FOS = 1.654 ** (Fo factor = 1.065)

Failure surface No. 4 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	373.17	1983.27
2	409.29	1964.06
3	705.16	2020.65
4	747.42	2111.28
5	748.36	2113.29
6	748.36	2121.29

** Corrected JANBU FOS = 1.659 ** (Fo factor = 1.072)

Failure surface No. 5 specified by 7 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	338.87	1969.82
2	376.15	1950.00
3	376.52	1949.83
4	634.67	1998.70
5	671.10	2076.82
6	684.72	2102.44
7	684.72	2110.44

** Corrected JANBU FOS = 1.671 ** (Fo factor = 1.077)

Failure surface No. 6 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	338.58	1969.68
2	371.34	1952.26
3	698.24	2004.29
4	740.50	2094.92
5	749.04	2113.22
6	749.04	2121.22

** Corrected JANBU FOS = 1.676 ** (Fo factor = 1.074)

Failure surface No. 7 specified by 6 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	355.47	1974.24
2	366.38	1968.44
3	684.79	2019.88
4	723.13	2102.09
5	730.16	2115.32
6	730.16	2123.32

** Corrected JANBU FOS = 1.683 ** (Fo factor = 1.071)

Failure surface No. 8 specified by 6 coordinate points

W.O. 8838
Sec. D-D' W=100' D=5'

Point No.	x-surf (ft)	y-surf (ft)
1	335.70	1968.20
2	363.48	1953.42
3	641.78	2003.64
4	677.31	2079.84
5	690.92	2105.42
6	690.92	2113.42

** Corrected JANBU FOS = 1.684 ** (Fo factor = 1.075)

Failure surface No. 9 specified by 8 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	337.41	1969.08
2	373.29	1950.00
3	402.45	1936.40
4	664.91	1986.14
5	707.17	2076.77
6	717.76	2099.49
7	726.40	2115.73
8	726.40	2123.73

** Corrected JANBU FOS = 1.699 ** (Fo factor = 1.081)

Failure surface No.10 specified by 5 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	371.18	1982.25
2	396.18	1968.95
3	724.17	2030.23
4	761.99	2111.34
5	761.99	2119.34

** Corrected JANBU FOS = 1.710 ** (Fo factor = 1.065)

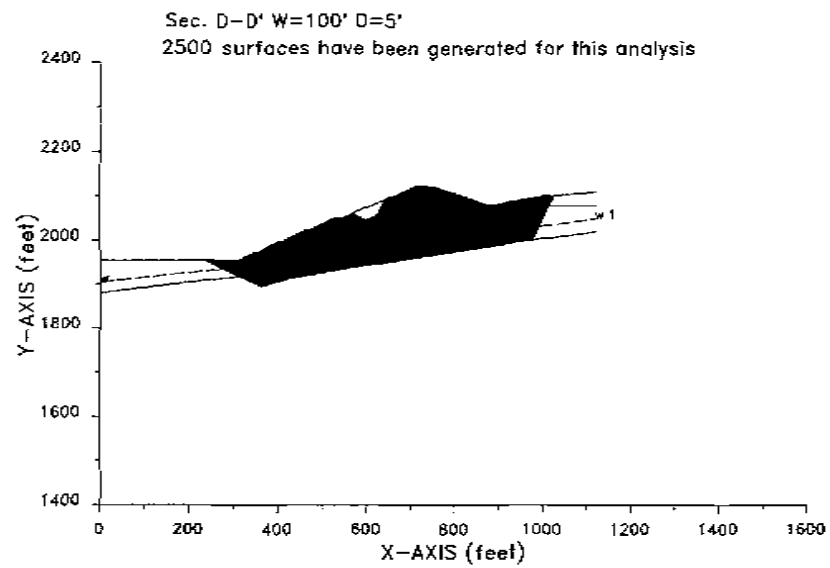
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. D-D' W=100' D=5'

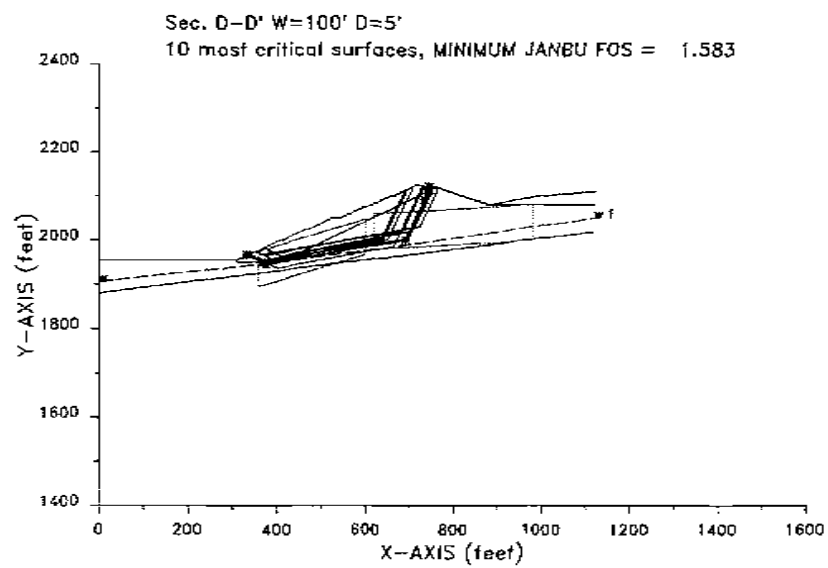
	Modified JANBU FOS	Correction Factor	Initial x-coord (ft)	Terminal x-coord (ft)	Available Strength (lb)
1.	1.583	1.075	333.37	743.93	1.517E+06
2.	1.648	1.079	356.13	704.53	1.196E+06
3.	1.654	1.065	354.12	751.86	1.194E+06
4.	1.659	1.072	373.17	748.36	1.271E+06
5.	1.671	1.077	338.87	684.72	1.143E+06
6.	1.676	1.074	338.58	749.04	1.518E+06
7.	1.683	1.071	355.47	730.16	1.126E+06
8.	1.684	1.075	335.70	690.92	1.125E+06
9.	1.699	1.081	337.41	726.40	1.672E+06
10.	1.710	1.065	371.18	761.99	1.227E+06

* * * END OF FILE * * *

88380 4-13-** 14:56



88380 4-13-** 14:56



GEOLABS-WESTLAKE VILLAGE

Plate D.3

XSTABL File: 8838K 4-12-** 11:28

```
*****************************************
*              X S T A B L              *
*                                       *
*       Slope Stability Analysis        *
*             using the                 *
*          Method of Slices             *
*                                       *
*        Copyright (C) 1992 À 96        *
*   Interactive Software Designs, Inc.  *
*       Moscow, ID 83843, U.S.A.        *
*                                       *
*         All Rights Reserved           *
*                                       *
*  Ver. 5.201                96 À 1545  *
*****************************************
```

Problem Description : Sec. N-N' W=80' D=5'/W=50' D=5'

SEGMENT BOUNDARY COORDINATES
---

27 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1625.0	160.0	1625.0	1
2	160.0	1625.0	194.0	1638.0	2
3	194.0	1638.0	202.0	1638.0	2
4	202.0	1638.0	251.0	1663.0	2
5	251.0	1663.0	259.0	1663.0	2
6	259.0	1663.0	310.0	1688.0	2
7	310.0	1688.0	318.0	1688.0	2
8	318.0	1688.0	367.0	1711.0	2
9	367.0	1711.0	387.0	1711.0	2
10	387.0	1711.0	435.0	1734.0	2
11	435.0	1734.0	443.0	1734.0	2
12	443.0	1734.0	493.0	1760.0	2
13	493.0	1760.0	501.0	1760.0	2
14	501.0	1760.0	549.0	1783.0	2
15	549.0	1783.0	557.0	1783.0	2
16	557.0	1783.0	603.0	1804.0	2
17	603.0	1804.0	623.0	1804.0	2
18	623.0	1804.0	669.0	1823.0	2
19	669.0	1823.0	677.0	1823.0	2
20	677.0	1823.0	710.0	1839.0	2
21	710.0	1839.0	770.0	1840.0	2
22	770.0	1840.0	975.0	1900.0	1
23	975.0	1900.0	1080.0	1860.0	1
24	1080.0	1850.0	1150.0	1858.0	1
25	1150.0	1858.0	1170.0	1850.0	1
26	1170.0	1850.0	1190.0	1840.0	1
27	1190.0	1840.0	1215.0	1820.0	3

8 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	160.0	1625.0	160.1	1620.0	1
2	160.1	1620.0	240.0	1620.0	3
3	240.0	1620.0	387.0	1706.0	3
4	387.0	1706.0	437.0	1706.0	3
5	437.0	1706.0	540.0	1755.0	3
6	540.0	1755.0	670.0	1815.0	1
7	670.0	1815.0	770.0	1840.0	1
8	540.0	1755.0	1190.0	1840.0	3

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

---
ISOTROPIC Soil Parameters
---

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	200.0	40.00	.000	.0	0

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between x = 155.0 ft
and x = 165.0 ft

Each surface terminates between x = 700.0 ft
and x = 1080.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

24.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined

W.O. 8838
Sec. N-N'

within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface
is specified by 25 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	160.56	1625.21
2	183.65	1631.75
3	206.69	1638.47
4	229.68	1645.36
5	252.62	1652.41
6	275.50	1659.65
7	298.33	1667.05
8	321.11	1674.62
9	343.82	1682.36
10	366.48	1690.27
11	389.08	1698.36
12	411.62	1706.61
13	434.09	1715.03
14	456.50	1723.61
15	478.85	1732.37
16	501.13	1741.29
17	523.34	1750.38
18	545.49	1759.63
19	567.56	1769.05
20	589.56	1778.64
21	611.49	1788.39
22	633.35	1798.30
23	655.13	1808.38
24	669.17	1815.00
25	669.17	1823.00

**** Simplified BISHOP FOS = 2.153 ****

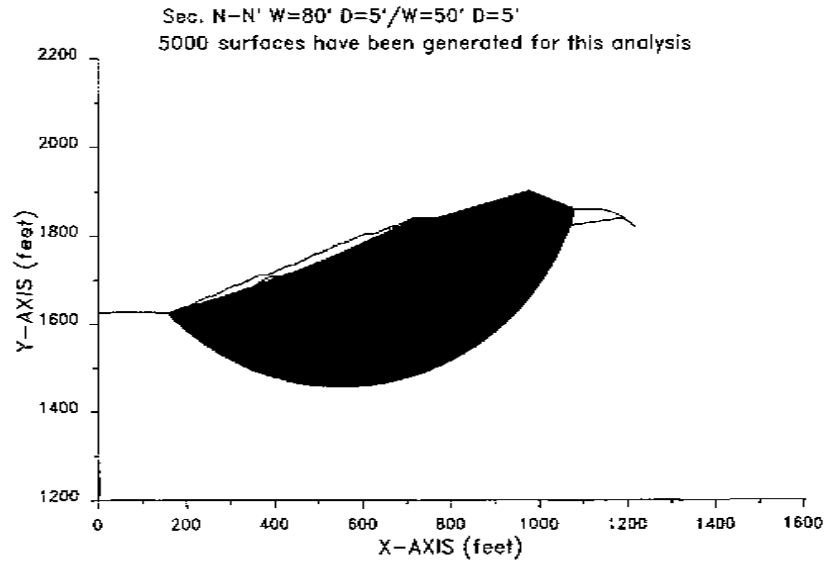
The following is a summary of the TEN most critical surfaces

Problem Description : Sec. N-N' W=80' D=5'/W=50' D=5'

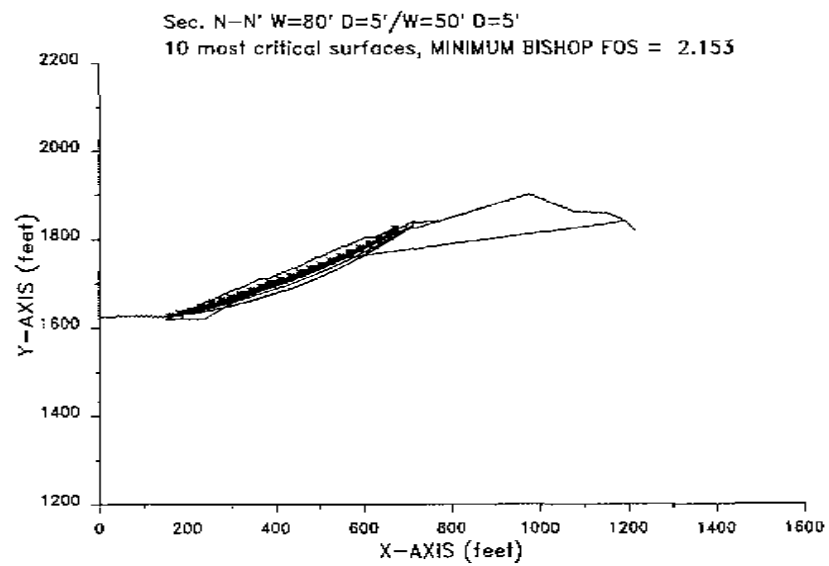
	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	2.153	-701.50	4712.09	3204.99	160.56	669.17	2.227E+09
2.	2.226	-421.40	3955.16	2401.10	163.89	658.92	1.960E+09
3.	2.249	-713.64	4782.35	3275.59	163.89	673.53	2.485E+09
4.	2.264	-740.27	4860.00	3357.88	160.56	675.10	2.622E+09
5.	2.279	-623.90	4549.10	3027.05	162.78	675.18	2.504E+09
6.	2.281	-368.82	3824.14	2261.75	160.56	669.79	2.098E+09
7.	2.332	-127.56	3235.26	1635.63	160.56	711.00	2.352E+09
8.	2.333	28.36	2827.50	1208.63	163.89	712.27	2.211E+09
9.	2.334	-214.82	3415.02	1828.56	161.67	670.28	2.018E+09
10.	2.335	50.98	2742.39	1121.91	162.78	694.81	2.036E+09

* * * END OF FILE * * *

8838N 4-12-** 11:28



8838N 4-12-** 11:28



GEOLABS-WESTLAKE VILLAGE

Plate N.2

W.O. 8838

Sec. N-N' Pseudostatic

XSTABL File: 8838NP 4-12-** 11:29

```
*****************************************
*              X S T A B L              *
*                                       *
*        Slope Stability Analysis       *
*              using the                *
*           Method of Slices            *
*                                       *
*        Copyright (C) 1992 A 96        *
*   Interactive Software Designs, Inc.  *
*        Moscow, ID 83843, U.S.A.       *
*                                       *
*         All Rights Reserved           *
*                                       *
* Ver. 5.201                96 A 1543   *
*****************************************
```

Problem Description : Sec. N-N' W=80' D=5'/W=50' D=5' Pse

SEGMENT BOUNDARY COORDINATES

27 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	1625.0	160.0	1625.0	1
2	160.0	1625.0	194.0	1638.0	2
3	194.0	1638.0	202.0	1638.0	2
4	202.0	1638.0	251.0	1663.0	2
5	251.0	1663.0	259.0	1663.0	2
6	259.0	1663.0	310.0	1688.0	2
7	310.0	1688.0	318.0	1688.0	2
8	318.0	1688.0	367.0	1711.0	2
9	367.0	1711.0	387.0	1711.0	2
10	387.0	1711.0	435.0	1734.0	2
11	435.0	1734.0	443.0	1734.0	2
12	443.0	1734.0	493.0	1760.0	2
13	493.0	1760.0	501.0	1760.0	2
14	501.0	1760.0	549.0	1783.0	2
15	549.0	1783.0	557.0	1783.0	2
16	557.0	1783.0	603.0	1804.0	2
17	603.0	1804.0	623.0	1804.0	2
18	623.0	1804.0	669.0	1823.0	2
19	669.0	1823.0	677.0	1823.0	2
20	677.0	1823.0	710.0	1839.0	2
21	710.0	1839.0	770.0	1840.0	2
22	770.0	1840.0	975.0	1900.0	1
23	975.0	1900.0	1080.0	1860.0	1
24	1080.0	1860.0	1150.0	1858.0	1
25	1150.0	1858.0	1170.0	1850.0	1
26	1170.0	1850.0	1190.0	1840.0	1
27	1190.0	1840.0	1215.0	1820.0	3

8 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	160.0	1625.0	160.1	1620.0	1
2	160.1	1620.0	240.0	1620.0	3
3	240.0	1620.0	387.0	1706.0	3
4	387.0	1706.0	437.0	1706.0	3
5	437.0	1706.0	540.0	1755.0	3
6	540.0	1755.0	670.0	1815.0	1
7	670.0	1815.0	770.0	1840.0	1
8	540.0	1755.0	1190.0	1840.0	3

A CRACKED ZONE HAS BEEN SPECIFIED

Depth of crack below ground surface = 8.00 (feet)
Maximum depth of water in crack = .00 (feet)
Unit weight of water in crack = 62.40 (pcf)

Failure surfaces will have a vertical side equal to the specified depth of crack and be affected by a hydrostatic force according to the specified depth of water in the crack

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	130.0	140.0	225.0	40.00	.000	.0	0
2	125.0	135.0	200.0	34.00	.000	.0	0
3	130.0	140.0	200.0	40.00	.000	.0	0

A horizontal earthquake loading coefficient of .150 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

5000 trial surfaces will be generated and analyzed.

500 Surfaces initiate from each of 10 points equally spaced along the ground surface between x = 155.0 ft and x = 165.0 ft

Each surface terminates between x = 700.0 ft and x = 1080.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

24.0 ft line segments define each trial failure surface.

GEOLABS-WESTLAKE VILLAGE

Plate Np.1

W.O. 8838
Sec. N-N' Pseudostatic

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 25 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	160.56	1625.21
2	183.65	1631.75
3	206.69	1638.47
4	229.68	1645.36
5	252.62	1652.41
6	275.50	1659.65
7	298.33	1667.05
8	321.11	1674.62
9	343.82	1682.36
10	366.48	1690.27
11	389.08	1698.36
12	411.62	1706.61
13	434.09	1715.03
14	456.50	1723.61
15	478.85	1732.37
16	501.13	1741.29
17	523.34	1750.38
18	545.49	1759.63
19	567.56	1769.05
20	589.56	1778.64
21	611.49	1788.39
22	633.35	1798.30
23	655.13	1808.38
24	669.17	1815.00
25	669.17	1823.00

**** Simplified BISHOP FOS = 1.475 ****

The following is a summary of the TEN most critical surfaces

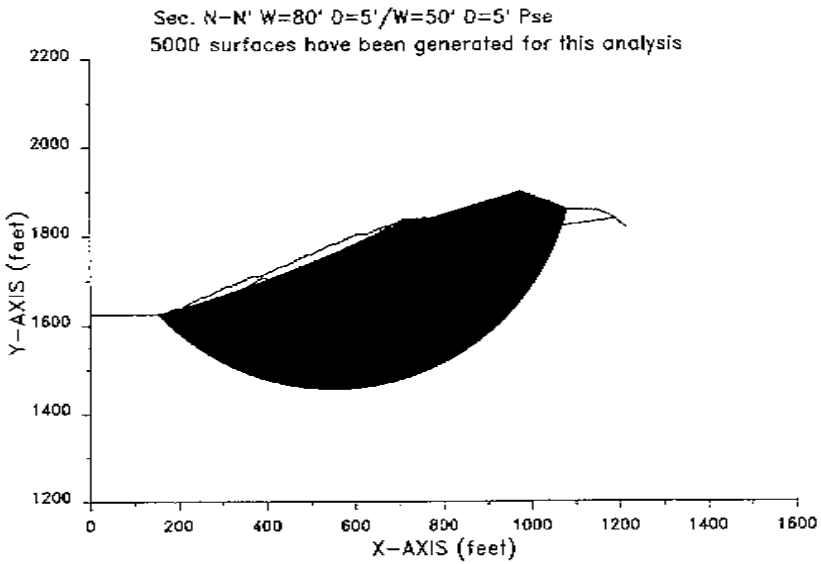
Problem Description : Sec. N-N' W=80' D=5'/W=50' D=5' Pse

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.475	-701.50	4712.09	3204.99	160.56	669.17	2.120E+09
2.	1.524	-421.40	3955.16	2401.10	163.89	658.92	1.861E+09
3.	1.537	-713.64	4782.35	3275.59	163.89	673.53	2.363E+09
4.	1.546	-740.27	4860.00	3357.88	160.56	675.10	2.493E+09
5.	1.556	-623.90	4549.10	3027.05	162.78	675.18	2.379E+09
6.	1.560	-368.82	3824.14	2261.75	160.56	669.79	1.990E+09
7.	1.593	-695.90	4844.16	3330.44	165.00	723.26	3.206E+09
8.	1.593	-127.56	3235.26	1635.63	160.56	731.00	2.228E+09
9.	1.594	-78.98	3126.01	1519.30	162.78	715.61	2.282E+09
10.	1.594	28.36	2827.50	1208.63	163.89	712.27	2.095E+09

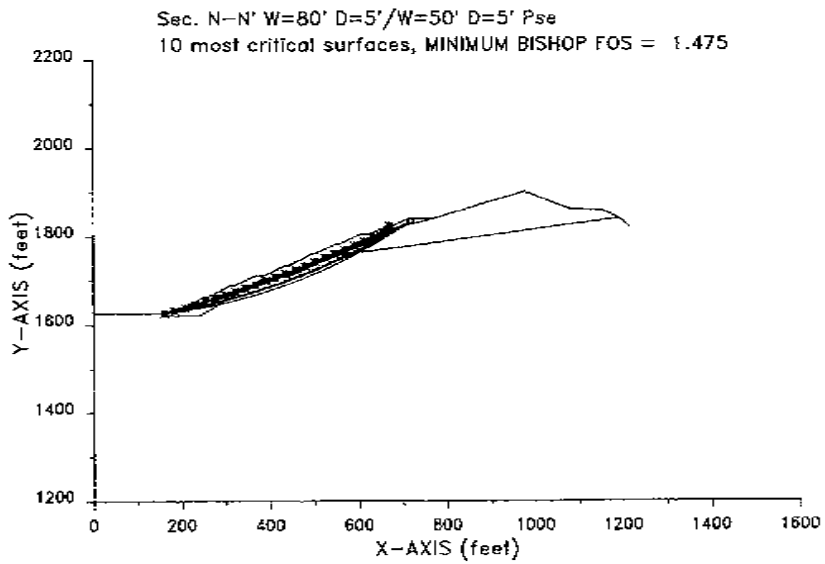
* * * END OF FILE * * *

W.O. 8838
Sec. N-N' Pseudostatic

8838NP 4-12-** 11:29



8838NP 4-12-** 11:29



REFERENCES

AEG, November 3, 1990; Geology and Engineering Geology of the Western Soledad Basin, Los Angeles County, California, Field Trip Guidebook

CDMG, 1998; Seismic Hazard Evaluation Report of the Mint Canyon 7.5-Minute Quadrangle, Los Angeles County, California, OFR-98-09

..., 1998; Official Map of Seismic Hazards Zones, Mint Canyon 7.5 Min. Quadrangle, Los Angeles County, California

Dibblee, T.W. Jr., 1996; Geologic Map of the Mint Canyon Quadrangle, Los Angeles County, California, Scale 1:24,000

Geolabs-Westlake Village, October 17, 1995; Geotechnical Overview, Property Northwest of Sierra Highway and Soledad Canyon Road, County of Los Angeles

..., June 19, 2001; Second Party Review of Geotechnical Conditions and Reports, Tract 46626, North of Canyon Crest Drive, City of Santa Clarita, California

..., March 6, 2004; Geotechnical Investigation of Vesting Tentative Tract Map No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

..., August 23, 2004; Response to LACDPW Review Sheets Dated May 25 and June 15 ,2004 for Tentative Tract Map No. 60922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

..., January 3, 2005; Response to LACDPW Review Sheets dated October 12 and 15, Tentative Tract No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

..., November 16, 2006; Addendum Geotechnical Report, Tentative Tract Map No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

GeoSoils, Inc., August 31, 2006; Progress Report No. 2, May 2006, Rough Grading of Tracts 46018-08 through 46018-11, Plum Canyon, County of Los Angeles, California

..., June 23, 2006; Progress Report No. 1, April 2006, Rough Grading of Tracts 46018-08 through 46018-11, Plum Canyon , County of Los Angeles, California

..., June 5, 2006; Geologic and Geotechnical Engineering Report, Revised Tentative Tract Map 46018, Plum Canyon, County of Los Angeles, California, W.O. 5602A

..., April 17, 2002; Offsite Grading, North Rear of Lot 28, Tract 46626, Canyon Country, City of Santa Clarita, California

.., June 30, 1999; Final Compaction Report, Lots 1 through 138, Tract 46626, Santa Clarita, California

..., February 9, 1999; Progress Report, Tract 46626, Lots 1 through 138, City of Santa Clarita, California

..., October 31, 1996; Memo-Field Exploration of Landslide and Water Tank Site, Vesting Tentative Tract 46626, Canyon Country, City of Santa Clarita, California

..., February 5, 1999; Construction Memo-False Cut/Back Cut Failure, Tract 46626, Canyon Country, City of Santa Clarita, California

..., March 18, 1997; Summary of Removals and Buttress Sizing, 138 Lot Portion of Vesting Tentative Tract 46626, Canyon Country, City of Santa Clarita, California

Geotechnical Associates, February 4, 1997; Final Rough Grading Compaction Test Report, Plum Canyon/Whites Canyon Road Alignment, 7.5.464., Tentative Tract No. 46018, Saugus Area of Los Angeles County, CA

LACDPW, May 5 and June 15, 2004; Geologic and Soils Engineering Review Sheets for Tent. Tr. Map 060922, Santa Clarita Area, County of Los Angeles, California

..., October 12 and 15, 2004; Geologic and Soils Engineering Review Sheets for Tent. Tr. Map 060922, Santa Clarita Area, County of Los Angeles, California

..., February 7 and 22, 2005; Geologic and Soils Engineering Review Sheets (Approval) for Tentative Tract Map 060922, Santa Clarita Area, County of Los Angeles, California

..., July 24 and August 2, 2006; Geologic and Soils Engineering Review Sheets fort Revised Tentative Tract Map 46018, Plum Canyon

..., February 6 and 8, 2007; Geologic and Soils Engineering Review Sheets for Tentative Tract Map 60922, Santa Clarita Area, County of Los Angeles, California

Larson, R.A., and Buckley, C.I., 1990; Geology and Engineering Geology of the Western Soledad Basin, Los Angeles County, California, Southern California Section of the Association of Engineering Geologists, 1990 Annual Field Trip Guidebook.

Leighton and Associates, October 11, 1999; Supplemental Geotechnical Investigation and Geotechnical Review of the 100-Scale Bulk Grading Plan, Tr. 46018, Plum Canyon, Saugus, California

..., April 19, 2004; Geotechnical Review of the 40-Scale Rough Grading Plan, Tracts 46018-10 and 46018-11, and Associated Fill Disposal Site, Plum Canyon Area, Saugus, County of Los Angeles, California

Munger Map Book, 1994; California-Alaska Oil and Gas Fields

Pacific Soils Engineering, Inc., May 6, 1992; Response to LACDPW Geologic and Geotechnical Engineering Review Sheets of the Supplemental Geologic/Geotechnical Investigation and Preliminary Grading Plan Review, Tracts 44967, 49433, and 49434 of Tentative Tract 44967, Mystery Mesa Project, County of Los Angeles, California

..., October 18, 1993; Grading Plan Review, Tract 49433 (Unit of Tentative Tract No. 44967), Including Summary of Geologic/Geotechnical Investigations, Mystery Mesa Project, County of Los Angeles, California

Saul, R.B., and Wooton, T.M., 1983, Geology of the south half of the Mint Canyon Quadrangle, Los Angeles County, California, CDMG Open File Report 83-24LA, Map Scale 1:9,600

Yerkes, R.F.(compiler), 1996; Preliminary Geologic Map of the Mint Canyon 7.5 Minute Quadrangle, Southern California, U.S. Geological Survey Open File Report 96-89, Scale 1:24,000

AERIAL PHOTOGRAPHS

Flight C-300, 1928, Frames F9, F10, F11, E243, E244, E245, Scale 1:18,000

Flight C-17727, 1952, Frames 4-72, 4-73, 4-74, Scale 1:14,400

Flight TG-7600, 1976, Frames 21-3, 21-4, 21-5, Scale 1:24,000

Flight 94-028, acc. 04684, 1994, Frames 106, 107, 108, 1:32,500

Horizon Surveys, performed for Sikand Engineering, Tr. 50846, Monarch Hills project, dated January 29, 1994, Frames 1-5, Scale 1:4800 +/-

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 60922
SUBDIVIDER Pardee Homes
ENGINEER Sikand
GEOLOGIST & SOILS ENGINEER Geolabs – Westlake Village

TENTATIVE MAP DATED 8/27/08 (Revised)
LOCATION Santa Clarita
GRADING BY SUBDIVIDER [Y] (Y or N)
REPORT DATE 8/28/08, 4/13/07, 11/16/06, 1/3/05, 8/23/04, 3/6/04

TENTATIVE MAP FEASIBILITY IS RECOMMENDED FOR APPROVAL FROM A GEOLOGIC STANDPOINT

THE FOLLOWING CONDITIONS MUST BE FULFILLED:

1. The final map must be approved by the Geotechnical and Materials Engineering Division (GMED) to assure that all geotechnical requirements have been properly depicted. For Final Map clearance guidelines refer to GS051.0 in the Manual for Preparation of Geotechnical Reports (http://www.dpw.lacounty.gov/gmed/manual.pdf).

2. A grading plan must be geotechnically approved by the GMED prior to Final Map approval. The grading depicted on the plan must agree with the grading depicted on the tentative tract or parcel map and the conditions approved by the Planning Commission. If the subdivision is to be recorded prior to the completion and acceptance of grading, corrective geologic bonds may be required.

3. Prior to grading plan approval a detailed engineering geology and soils engineering report must be submitted that addresses the proposed grading. All recommendations of the geotechnical consultants must be incorporated into the plan (Refer to the Manual for Preparation of Geotechnical Reports at http://www.dpw.lacounty.gov/gmed/manual.pdf).

4. All geologic hazards associated with this proposed development must be eliminated. Alternatively, the geologic hazards may be designated as restricted use areas (RUA), and their boundaries delineated on the Final Map. These RUAs must be approved by the GMED, and the subdivider must dedicate to the County the right to prohibit the erection of buildings or other structures within the restricted use areas (refer to GS063.0 in the manual for preparation of Geotechnical Reports).

5. The Soils Engineering review dated 9/30/08 is attached.

Prepared by _____ Reviewed by _____ Date 9/24/08
Geir Mathisen

Please complete a Customer Service Survey at http://dpw.lacounty.gov/go/gmedsurvey
P:\gmepub\Geology_Review\Geir\Review Sheets\District 8.2 (Santa Clarita)\Tracts\60922, TM9 APP.doc

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 8.2
Job Number LX001129
Sheet 1 of 1

DISTRIBUTION:
___ Drainage
___ Grading
___ Geo/Soils Central File
___ District Engineer
___ Geologist
___ Soils Engineer
___ Engineer/Architect

Tentative Tract Map	60922
Location	Santa Clarita
Developer/Owner	Pardee Homes
Engineer/Architect	Sikand
Soils Engineer	Geolabs - Westlake Village
Geologist	Same as above

Review of:

Revised Tentative Parcel Map Dated by Regional Planning **8/27/08**
Soils Engineering Report and Addenda Dated 4/13/07, 11/16/06, 1/3/05, 8/23/04, 3/6/04
Previous Review Sheet Dated 6/25/07

ACTION:

Tentative Map feasibility is recommended for approval, subject to conditions below:

REMARKS:

1. At the grading plan stage, submit two sets of grading plans to the Soils Section for verification of compliance with County codes and policies.

2. At the grading plan stage, provide geotechnical maps and tentative maps that conform. The geotechnical maps within the submitted report do not conform to the latest tentative map dated 8/27/08 by Regional Planning.

NOTE(S) TO THE PLAN CHECKER/BUILDING AND SAFETY ENGINEER:
A. ONSITE SOILS HAVE A MEDIUM EXPANSION POTENTIAL AND ARE CORROSIVE TO METALS.
B. OFF-SITE GRADING IS RECOMMENED FOR THE REMOVAL AND RECOMPACTION OF LANDSLIDES QLS-9A, QLS-10, QLS-10A, L1, AND L17.

REGISTERED PROFESSIONAL ENGINEER YOSHIYA MORISAKU No. 67587 Exp. 6/30/09 CIVIL STATE OF CALIFORNIA

Reviewed by _____ Date 9/30/08
Yoshiya Morisaku

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\60922TentTg

GEOLABS-WESTLAKE VILLAGE
Foundation and Soils Engineering, Geology
31119 Via Colinas, Suite 502 • Westlake Village, CA 91362
Voice: (818) 889-2562 (805) 495-2197
Fax: (818) 889-2995 (805) 379-2603
a dba of
R & R Services
Corporation

August 28, 2008
W.O. 8838

Pardee Homes
26650 The Old Road, Suite 110
Valencia, California 91381

Attention: Mr. Tom Mitchell

SUBJECT: Addendum Geotechnical Report,
Tentative Tract No. 060922, Skyline Ranch,
Santa Clarita Area, County of Los Angeles, California

Mr. Mitchell:

We present herein an addendum geotechnical report for Tentative Tract Map No. 060922 to address the changes made to the Tentative Tract Map design since the issuance of our last geotechnical report dated April 13, 2007. Discussion, analyses, and recommendations provided in previous reports remain applicable unless superseded herein.

MODIFICATION TO TENTATIVE TRACT MAP

The Tentative Tract Map (TTM) used as a base for the geologic map in the April 13, 2007 report did not match the TTM submitted to planning. That is because updates included in our base map were ahead of the planning submittal.

There have been some minor modifications to the TTM since the April 13, 2007 report. We have compared the current TTM to the April 13, 2007 report map. Overall they maintain the same design. Differences between the two include:

- Proposed grades for the park site on Lot 1272 have been lowered approximately 8 to 11 feet. These modified grades result in a reduction of the perimeter slope heights

along the southern and western sides while increasing the slope heights along the northern boarder. In addition, the previously proposed 2:1 (horizontal: vertical) slope that divided the park site into the upper eastern portion and lower western portion has been removed. An 8:1 slope is now proposed in the north central portion of the park site.

- Proposed grades for the park site on Lot 1273 have been modified by approximately four feet or less. The northern portion has been raised approximately four feet while the southern portion was lowered approximately two feet. The modified proposed grades results in minor adjustment of the adjacent proposed pad grades and slope heights.
- Proposed grades for the school site on Lot 1271 have been raised approximately four feet. The raised proposed grades results in minor adjustment of the adjacent proposed pad grades and slope heights.
- Two small basins previously proposed along the northeastern and southwestern sides of Skyline Ranch Road, immediately northwest of Sierra Highway, have been removed.
- The proposed booster station on Lot 1324 has been shifted toward the north and the proposed grades modified slightly.
- Proposed pad grades have been raised or lowered about 2 ½ feet or less in some areas throughout the site (i.e. Lots 1208-1270).
- Proposed lot lines have been shifted slightly in a few locations throughout the site (i.e. between Lots 653-659).

- The top or toe of proposed slopes about the perimeter of the proposed development have been modified slightly (i.e. northern boundary).
- An approximately 10 foot tall 2:1 slope has been eliminated from the area immediately south of Lot 80.

These differences are inconsequential to the geological and soils engineering analyses and recommendations provided in the reviewed report. Additional investigation, analyses, or recommendations are not warranted at this time.

111 STATEMENT

Based upon tests conducted as outlined in this and applicable referenced reports, and if constructed in accordance with our recommendations and properly maintained, it is the opinion of the undersigned, a duly registered professional engineer and engineering geologist, that (1) the proposed grading and proposed structure(s) will be safe against hazard from landslide, settlement or slippage, and that (2) the proposed building or grading construction will have no adverse effect on the geologic stability of property outside the building site. The nature and extent of tests conducted for purposes of this declaration are, in the opinion of the undersigned, in conformance with generally accepted practices in this area. Test findings and statements of professional opinion do not constitute a guarantee or warranty, express or implied.

CLOSURE

This geotechnical report has been prepared in accordance with generally accepted engineering practices at this time and location. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

Thank you for this opportunity to be of service to you. Please do not hesitate to call if you have any questions regarding this report.

Respectfully submitted;
GEOLABS-WESTLAKE VILLAGE

Steve Diem
C.E.G. 2246
R.C.E. 73086

Ronald Z. Shmerling
C.E.G. 1047
R.C.E. 35444

Enclosures: References

XC: (1) Addressee
(1) Pardee-Valencia, Attention Jim Bizzelle
(2) Sikand Engineers, Attention Craig Young
(2) County of Los Angeles, Land Development (and 1 PDF on CD)
(2) PCR Services, Attention Jay Ziff (and 1 PDF on CD)
233 Wilshire Blvd., Suite 130
Santa Monica, CA 90401

References

Geolabs-Westlake Village, April 13, 2007; Response to Soils Engineering Review Sheet dated February 8, 2007, Tentative Tract Map No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

…, November 16, 2006; Addendum Geotechnical Report, Tentative Tract Map No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

…, January 3, 2005; Response to LACDPW Review Sheets dated October 12 and 15, Tentative Tract No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

…, August 23, 2004; Response to LACDPW Review Sheets dated May 25 and June 15, 2004 for Tentative Tract No. 60922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

…, March 6, 2004; Geotechnical Investigation of Vesting Tentative Tract No. 060922, Skyline Ranch, Santa Clarita Area, County of Los Angeles, California

Copies of Plate 1.2 on file with the
County of Los Angeles,
Department of Public Works,
Land Development

PCR Santa Monica
233 Wilshire Boulevard
Suite 130
Santa Monica, CA 90401
TEL 310.451.4488
FAX 310.451.5279
EMAIL info@pcrnet.com

PCR Irvine
One Venture
Suite 150
Irvine, CA 92618
TEL 949.753.7001
FAX 949.753.7002
EMAIL info@pcrnet.com

PCR Pasadena
55 South Lake Avenue
Suite 215
Pasadena, CA 91101
TEL 626.204.6170
FAX 626.204.6171
EMAIL info@pcrnet.com

PCR Santa Monica
233 Wilshire Boulevard
Suite 130
Santa Monica, CA 90401
TEL 310.451.4488
FAX 310.451.5279
EMAIL info@pcrnet.com

PCR Irvine
One Venture
Suite 150
Irvine, CA 92618
TEL 949.753.7001
FAX 949.753.7002
EMAIL info@pcrnet.com

PCR Pasadena
55 South Lake Avenue
Suite 215
Pasadena, CA 91101
TEL 626.204.6170
FAX 626.204.6171
EMAIL info@pcrnet.com