



GREEN

in the Castaic Aquatic
Center

How does the
Castaic Aquatic
Center protect our
environment?

County of Los Angeles
Department of Parks & Recreation
North Community Services Agency



SUSTAINABLE SITE

Construction Activity Pollution Prevention

During construction, the land is disturbed and exposed to foot and equipment traffic, precipitation and wind erosion which results in the loss of topsoil. Loss of topsoil reduces the soil's ability to support plant life. Without plants or temporary protection, the soil carried by storm water off-site can pollute adjacent sites and potentially affect water quality. The dirt carried by wind greatly impacts the air quality and may also cause traffic hazards.

An erosion and sedimentation control plan (Storm Water Pollution and Prevention Plan) was developed and implemented during the construction phase to reduce the impact to the environment and people. The following measures are examples of construction activity pollution prevention conducted in this project.

Perimeter Silt Fence and Gravel Bag for Sediment Control



Watering for Dust Control



Designated Vehicle Area for Unintended Oil Spill



Gravel Bag Berm & Sweeping for Sediment Control on Street





Alternative Transportation

The extensive use of single-occupancy vehicles in Southern California increases energy demand and associated greenhouse emissions, and also encroaches on greenspace in order to accommodate more parking. Public transportation, bicycles, low-emitting/fuel efficient vehicles, and car-pooling greatly reduces the use of single-occupancy vehicles, the reliance on fuel and its associated pollution. The effects of vehicle use include direct exhaust, greenhouse gas emissions, smog and air pollution, as well as, environmental impacts from oil extraction, petroleum refining, pollution and energy consumption by oil transportation. While many people understand the environmental impacts of single-occupany vehicle use, many single drivers are on the road out of convenience. The excuses could be there is no mass transportation near-by, no bicycle storage, no preferred parking space for low-emitting vehicles, and no car-pools.

There is a two-route bus stop in Castaic (City of Santa Clarita Transit, route 1 and 636) on Ridge Route Road at the corner of Castaic Road - only a four-minute walk. This facility also has bicycle rack as well as preferred parking spaces for low-emitting vehicles and carpools to encourage the reduction in single-occupancy vehicle use.

Public Transportation Access



Bicycle Storage



Low-Emitting Vehicle Preferred Parking



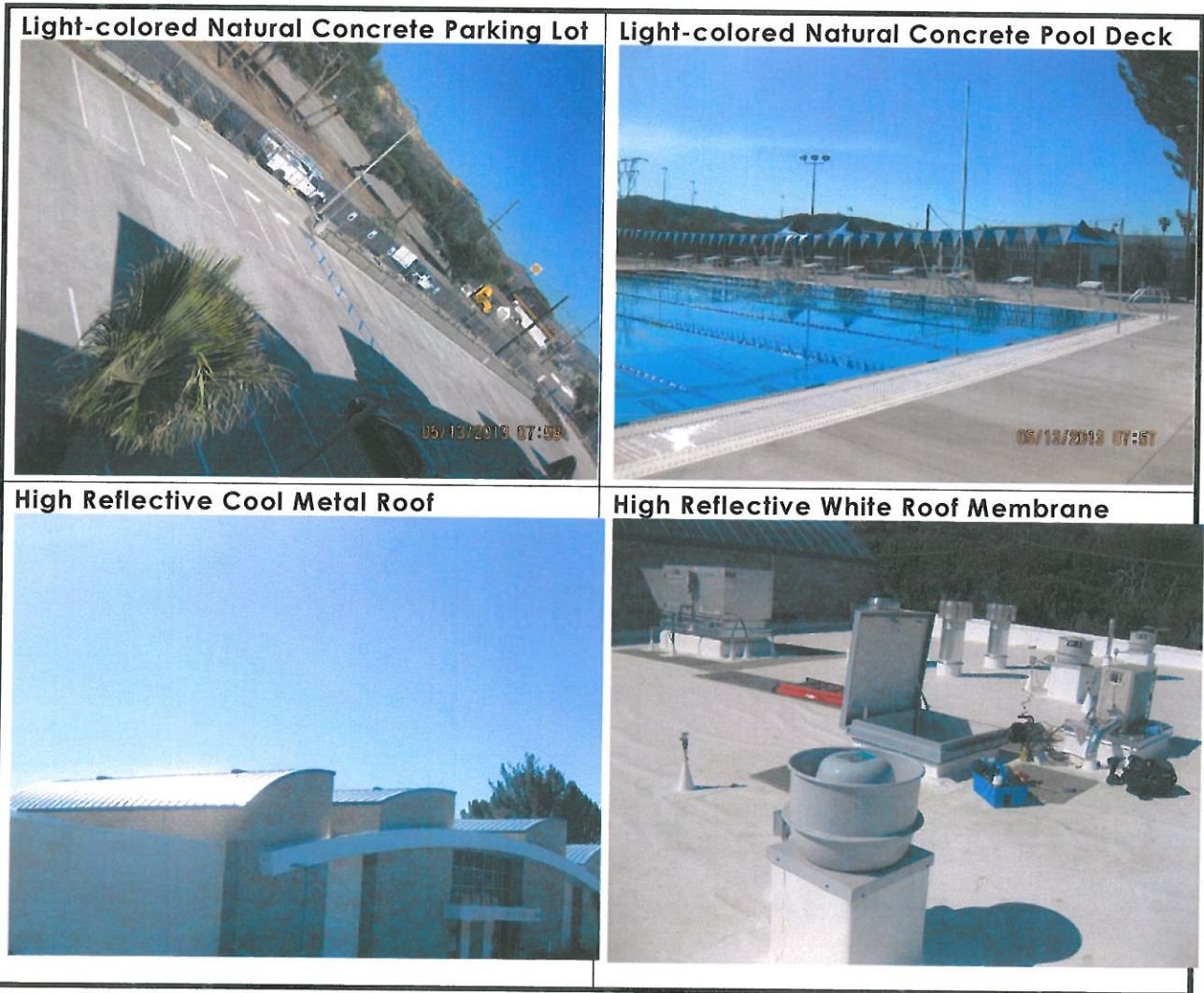
Carpool Preferred Parking





Heat Island Effect

Heat island effect refers to the absorption of heat by hardscape, such as dark, non-reflective parking pavement and building roofing, and its radiation to surrounding areas. Particularly in urban areas, other sources may include vehicle exhaust, air-conditioners, and street equipment. Reduced airflow between tall buildings and narrow streets exacerbates the effect. The use of dark and non-reflective surface pavement and roofing material contributes to the heat island effect by absorbing the sun radiation, then radiating absorbed heat into the surroundings, and increasing ambient temperatures. Particularly during the summer, the heat island impacts include increased energy consumption, elevated emissions of air pollutants and greenhouse gases, compromised human health and comfort, and impaired water quality. Instead of using a dark, non-reflective roof or pavement, using light-colored materials does not raise the overall temperature. During the design phase, light-color pavement and roofing material were chosen to minimize the heat island effect.

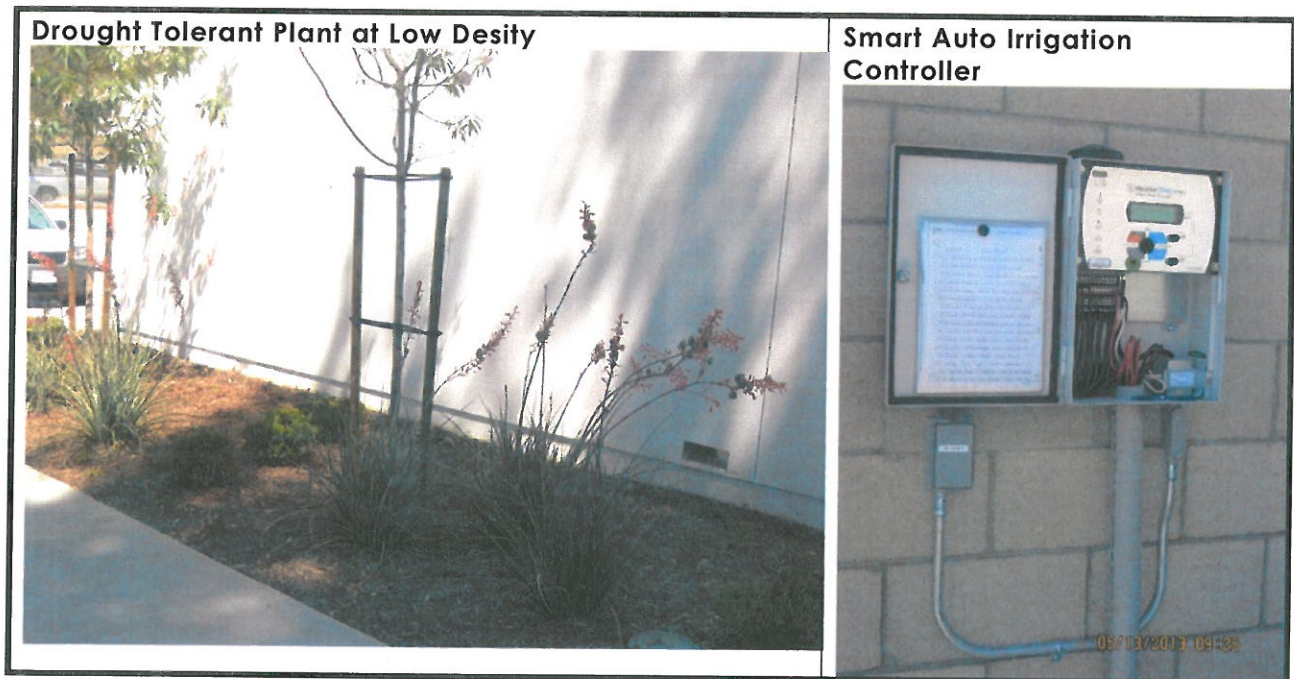


WATER EFFICIENCY

Water Efficient Landscaping

Landscape irrigation in the United States consumes 30% of potable water daily. Over-irrigation typically occurs in Southern California due to poor landscaping design and expensive advanced irrigation installation. The landscaping design at the Castaic Aquatic Center utilizes low dense and drought-tolerant plant species that require minimal water and saves over 50% water use comparing with conventional design. Landscape areas are mulched to conserve moisture and prevent evaporative water loss from the soil surface, so the need for irrigation during dry season is reduced. Turf grass, which requires a large amount of water for maintenance, is not applied. The irrigation system, including dripping irrigation combined with a smart irrigation controller, also reduces water use and associated conveying energy consumption.

The automatic irrigation controller in Castaic Aquatic Center is the industry's most advanced central control, and includes integrated flow management, alert notifications, real-time diagnostics and remote control. It adjusts irrigation based on evapotranspiration data and the water needs at each landscape station. Accordingly, it dramatically reduces excess irrigation water that plants do not need.





Water Use Reduction

The U.S. Geological Survey estimates that the United States uses 400 billion gallons of water per day, and the operation of buildings accounts for 12% of total water use. Reducing water for urinals, toilets, showerheads and faucets decreases building operation cost and the amount water withdrawn from rivers, streams, underground aquifers, and other water bodies. In addition, reducing potable water usage reduces energy usage and chemical inputs for water treatment, and the associated greenhouse gas emissions.

Many water-effective systems and fixtures were introduced to minimize the water usage. Such auto sensor low-flow flush/faucet and low-flow shower head installed in Castaic Aquatic Center meet the daily sanitation requirement and reduce the potable and waste water treatment and transportation energy consumption.

Auto Sensor Low-Flow Lavatory Faucet



Auto Sensor Low-Flow Toilet Flush



Auto Sensor Low-Flow Urinal Flush



Low-Flow Shower Head



ENERGY AND ATMOSPHERE

Optimize Energy Performance

The most common source of energy is fossil fuel, such as coal and oil. The extracting process and transportation of fossil fuels carry many environmental impacts, including air and water pollution, land degradation, solid waste generation, and greenhouse gas emissions. These impacts relevant to energy usage are connected to climate change that poses risks to ecosystems, the environment, and human health and safety.

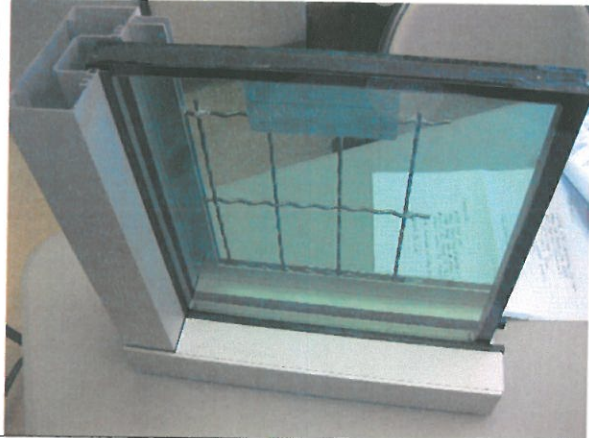
The energy saving strategy was discussed between the County of Los Angeles, Perera Construction & Design (the design-build contractor), the architect, and engineers. The goal was to reduce the energy consumption beyond what is required by the state of California's strict energy performance requirement. The strategy to optimize energy performance was to reduce demand and increase efficiency.

- (1) Reduce Demand –
 - a. Insulated building envelope to reduce energy usage by HVAC system.
 - b. Programed lighting and HVAC control to reduce unnecessary energy usage.
- (2) Increase Efficiency –
 - a. High efficiency HVAC, lighting and water heating system.
 - b. Commissioning prior to occupancy to ensure systems perform as designed.

High Efficiency Ceiling Insulation



Dual Pane Insulated Glass Panel



Lighting Central Control Panel & Programed HVAC Thermostat



High Efficiency HVAC Equipment



MATERIAL AND RESOURCES

Construction Waste Management

Construction and demolition generate enormous amount of solid waste. Most construction waste goes into landfills, increasing the burden on landfill loading and operation, and it can result in soil and water pollution. The incineration facility consumes energy and exhausts greenhouse gas. The greatest way to minimize landfill or incineration burden is to reduce the total generated waste.

In this project, more than 75% of construction and demolition debris was diverted from disposal in landfills and incineration facilities, and redirected back into the manufacturing process. Any reusable materials were directed to the appropriate site. The most important step for recycling of construction waste was on-site separation, which took extra effort and training of construction personnel. The waste management plan was prepared prior to the project, and commenced by coordinating with the subcontractors and Waste Management company. Construction personnel were instructed on the waste management plan during weekly meetings.

Construction Waste On-site Separation



Collect Concrete Washout & Recycle



Recycle Asphalt Debris to Base Material



Recycle Concrete Debris to Base Material



Recycled Content & Regional Material

It takes less energy to create new items from recycled materials than creating new products from raw materials. Mining minerals and milling trees into lumber require large amounts of energy. Also, extracting materials from mines or forests is done far from the place where goods are consumed. However, the material recycled and used in local areas reduces transportation energy and pollution. Using regional materials also reduces transportation activities and associated pollution.

The material available locally with high recycling content was the first priority during the design and construction phases. The most commonly used material usually contained higher recycled content and was available locally. Recycled aggregate from local recycling facilities was used as the sidewalk and road base. Locally manufactured and extracted gypsum board was utilized as much as possible to meet the design objective. Fly ash - the residues generated in combustion - was permitted to substitute about 15% of cement, which is made from raw limestone. The CMU block used in this building was manufactured at a local block plant in Sun Valley, CA. 100% of raw materials were extracted locally within a 500 mile radius.

Recycled Aggregate under Sidewalk



Regional Concrete with Recycled Fly-ash

Information Sheet for LEED NC Credits

Customer Name: SCI Inc.
Project Name: Castaic Sports Complex
Project Address: 31230 Castaic Rd., Castaic, CA 91384

Material Breakdown

Mix/Material	MR Credit 4 Recycled Content		Cement	Sand & Aggregates	Water & Admixtures
	By Cost	By Weight			
HRC05088	9%	2.4%	50.6%	39.6%	0.8%

Location Information

Manufacturer	Location	Distance From Job
Holiday Rock Co., Inc.	Santa Clarita, CA	25 Miles

MR Credit 5 Regional Materials

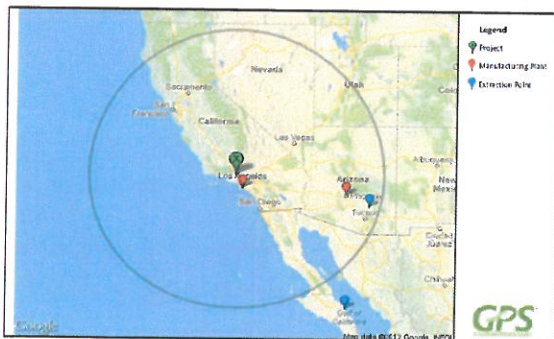
Material	Company	Source	Distance From Job
Sand & Aggregates	Holiday Rock Co., Inc.	Palmdale, CA	51 Miles
Cement	Mitsubishi Cement	Lacono Valley CA	115 Miles
Fly Ash	Salt River Materials Group	Folsom, CA	98 Miles

Holiday Companies certifies that the above referenced material(s) will contribute towards attaining LEED NC Credits for Recycled Content and/or Regional Materials.

Material Manufactured & Extracted within 500 miles radius from the job site

Materials and Resources - Regional Materials Map

The Map illustrates distances shown on the previous table with the project address at the center of the 500 mile radius.



Blocks Made in the Local Plant



INDOOR ENVIRONMENTAL QUALITY

Construction Indoor Air Quality

Construction workers are exposed to indoor air pollutants generated by synthetic building materials, power equipment, vehicles, new furnishings, and finish materials for long periods of time. If construction activity pollution is not addressed, the poor indoor air quality can last through the lifetime of the building. The effort to reduce indoor air pollution improves working conditions for construction personnel, lowers absenteeism, and increases productivity. Implementing the indoor air quality (IAQ) management plan, during construction and before occupancy, minimizes potential contamination problems.

The IAQ management Plan, which detailed the specific measures, was developed and executed by Perera Construction & Design, to minimize the construction impact to indoor air quality. The measures include (1) HVAC protection, (2) Source Control, (3) Pathway Interruption, (4) Housekeeping, and (5) Scheduling. The HVAC system was operated when no additional construction work occurred prior to occupancy to flush containment air out of the building.

HVAC Duct Opening Sealed during Construction



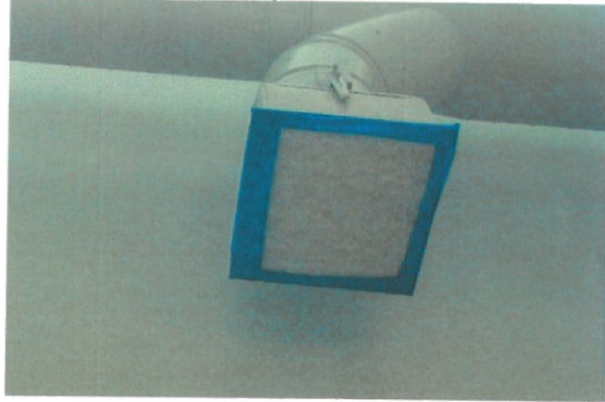
Broom Sweeping with Sweeping Compound



Spray Painting without Other Workers in the Same Room/Space



Filter on Returned Grille during Flush-out Prior to Occupancy

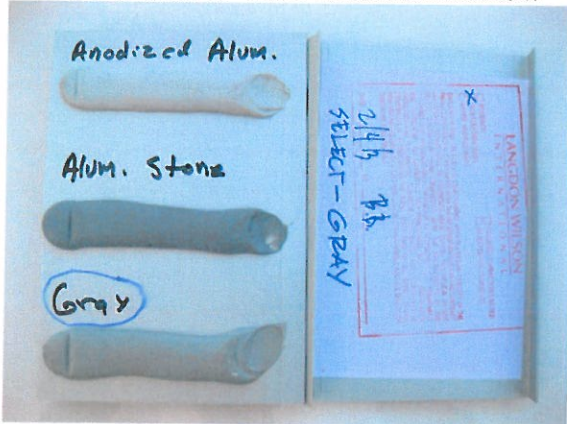


Low-Emitting Material

Low-emitting materials are products that do not release significant pollutants into the indoor environment. Products with high VOC (volatile organic compounds) are typically adhesives, sealants, paints, coatings, flooring, composite wood and agrifiber products. High VOC content tend to be odorous, irritating, and detrimental to the comfort and well-being of installers and occupants. VOCs also react with sunlight and nitrogen oxides in the atmosphere to form ground-level ozone, which is a major component of smog and has negative effects on human health and ecosystems.

All materials that might emit contaminants (VOCs) to the indoor air were carefully reviewed by the project team based on the most current standards. They include all surfaces in contact with indoor air inside of the building weather proof envelope. A comprehensive VOC limit chart was provided by a LEED consultant to ensure materials met the indoor low-emitting standards. Carpet and its adhesive were tested and certified by Green Label Plus for low VOC emissions. Wood products including wood door and cabinet did not contain formaldehyde which is known to be an irritant and harmful to health.

Potential Indoor VOC Material Review



Standard VOC Limits for Paints & Coatings

TABLE 3: STANDARD VOC LIMITS FOR PAINTS AND COATINGS

COATING CATEGORY	Ceiling Limit*	Current Limit	Effective Date							
			1/1/03	1/1/10	1/1/15	7/1/16	7/1/17	7/1/18	7/1/19	7/1/20
Bond Breakers	350									
Clear Wood Finishes	350									
Varnish	350						275			
Sanding Sealers	350						275			
Lacquer	680	550				275				
Clear Brushing Lacquer	680					275				
Concrete-Curing Compounds	350								100	
Concrete-Curing Compounds For Roadways and Bridges**	350									
Dry-Fog Coatings	400								150	
Fire-Proofing Exterior Coatings	450	350								
Fire-Retardant Coatings***										
Clear Pigmented	650									
Flats	350									
Floors	250	100								50
Floor Coatings	420		100					50		
Graphic Arts (Sign) Coatings	500									
Industrial Maintenance (IM) Coatings	420									
Coatings										
High Temperature IM Coatings	420									
Zinc-Rich IM Primers			420	340				100		
Japans/Faux Finishing Coatings	700	350								
Magnesium Cement Coatings	600	450								

Carpet Certified by Green Label Plus

Green Label Plus: Carpet and Adhesives

Sets Higher Standard for Indoor Air Quality

Green Label Plus, a voluntary industry testing program for carpet and adhesive products, establishes the high standard for indoor air quality (IAQ) ever set by the carpet industry. The Carpet and Rug Institute (CRI) creates Green Label Plus to identify carpets and adhesives that are tested by an independent, certified laboratory and meet stringent criteria for low chemical emissions.

Expands CRI's IAQ Green Label Program

There is a growing demand to make indoor environments as healthy and "green-friendly" as possible. Choosing the right materials is a critical step toward a better process. CRI has added Green Label Plus for carpet and all adhesives to its well-established Green Label program.

- Green Label Plus customers are purchasing among the lowest emitting carpet, adhesive and cushion products on the market.
- Green Label Plus is designed for architects, designers, specifiers and facility managers who want assurance that carpet and adhesive products meet the most stringent criteria for low chemical emissions.
- Green Label Plus adhesives are tested by an independent, certified laboratory and meet the IAQ standard for products.
- Green Label Plus adhesives and carpet products meet the Green Label Plus criteria.

Meets California's CHPS Criteria

Green Label Plus adhesives, and even carpets, California's indoor quality standards for the emitting products used in commercial settings such as schools and office buildings.

- Working in cooperation with California's Sustainable Building Task Force and the Department of Health Services, Indoor Air Quality Division, the carpet and adhesive products used in Green Label Plus are tested by an independent, certified laboratory and meet the California High Performance Schools (CHPS) criteria.
- Under the agreement between CRI and the California agencies, Green Label Plus is acceptable in lieu of Section 01320, the CHPS low emitting product specification for carpet and adhesive.
- Commercial carpet and adhesives that meet the criteria for Green Label Plus are labeled on both the Green Label Plus adhesives.

No-added Formaldehyde Fiberboard

SierraPine introduces another green innovation..

arreis®

When the earth demands affordable excellence.

Arreis® SDF*, the newest medium density fiberboard from SierraPine offers manufacturers, designers and specifiers an affordable fiberboard panel engineered for the planet.

- No-added formaldehyde
- Recycled wood fiber & FSC Certified wood
- LEED® credit support – M&R 4.1, 4.2, 5.1, 5.2, 7 and EQ 4.4
- Third party certification